HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H.P.I.)

COMBINED VOLUME - I TO V

(Revised & Augmented)

2016

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF HEALTH & FAMILY WELFARE
DEPARTMENT OF AYURVEDA, YOGA & NATUROPATHY, UNANI, SIDDHA AND HOMOEOPATHY
NEW DELHI

Preface to E-book

Combined Volume - Ist to IXth (Revised & Augmented)

The Government of India had constituted the Homoeopathic Pharmacopoeia Committee in the year of 1962. The objectives of Committee were (i) to prepare a Pharmacopoeia of Homeopathic drugs, whose therapeutic usefulness has been proved, on the lines of American, German and British Pharmacopoeia (ii) to lay down principles and standards for the preparation of homoeopathic drugs (iii) to lay down tests for identity, quality and purity (iv) such other matter as were incidental and necessary for the preparation of a Homeopathic Pharmacopoeia.

Several experts have contributed from time to time for the publications of 1st – IXth Volume of Homoeopathic Pharmacopoeia of India (HPI) that comprises monographs of 1010 drugs. The details are as under:

Volume	**Year**	**New**	**Revised**	**Total**
Volume I	1971	180	---	180
Volume II	1974	99	---	99
Volume III	1978	105	---	105
Volume IV	1984	104	02	106
Volume V	1987	109	01	110
Volume VI	1990	103	01	104
Volume VII	1999	77	28	105
Volume VIII	2000	74	27	101
Volume IX	2006	73	27	100
Total		**924**	**86**	**1010**

There are total 1010 monographs has been published in nine volumes by the Council till date and out of which, 924 monographs are new and 86 monographs are revised which contains 567 plant drugs, 301 chemical drugs, 39 zoological drugs, 03 mineral drugs, 02 hormones and 12 nosodes.

Over a period of time, it was noted that there are certain typographical and technical errors that requires correction. These have been checked, rectified and critically reviewed by the experts of respective field. I am happy to publish the corrected and augmented version by Homoeopathic Pharmacopoeia Laboratory (HPL), Central Council for Research in Homoeopathy (CCRH) and Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H). This arduous task has been accomplished by HPL, CCRH and PCIM&H.

The contribution of all the experts and staff of HPL and CCRH who worked dedicatedly is duly acknowledged.

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Combined Volume - Ist to IXth (Revised & Augmented)

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I N T R O D U C T I O N

Ten volumes of Homoeopathic Pharmacopoeia of India (H.P.I.) have been published.

Volume		No. of Monographs
Volume I	(1971)	180
Volume II	(1974)	100
Volume III	(1978)	105
Volume IV	(1984)	107
Volume V	(1987)	114
Volume VI	(1990)	104
Volume VII	(1999)	105
Volume VIII	(2000)	101
Volume IX	(2006)	100
Volume X	(2013)	101 (In Hardcopy only)

The present H.P.I. Combined Volume – Part First (Volume – I to V) comprises 601 monographs. This volume is being published on high demand and convenience of users. The general notices and general instructions published in Volume I to V of H.P.I. with amendments made from time to time are applicable to the contents of all the Volumes published so far.

The committee express the gratitude to the Secretary, Department of AYUSH, Shri Nilanjan Sanyal and Joint Secretary, Shri R. P. Singh for their guidance and visionary leadership and also sincerely thanks to Dr. R. K. Manchanda, Director General, CCRH, New Delhi, Dr. Alok Kumar, Deputy Advisor (Homoeopathy) to the Govt. of India, Dr. Anil Khurana, Assistant Director, CCRH, New Delhi for providing constant support for completion of this task and continuation of project.

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Cumulative List of Monographs for H.P.I. Volume I to V with Abbreviations

S. No.	Name of the Monograph	Abbreviation	Volume
1.	Abies Canadensis	Abies c.	II
2.	Abies Nigra	Abies n.	V
3.	Abroma Radix	Abrom. r.	IV
4.	Abroma Augusta	Abrom. ag.	I
5.	Abrotanum	Abrot.	I
6.	Absinthium	Absinth.	II
7.	Acalypha Indica	Acal. ind.	I
8.	Acetanilidum	Acetan.	III
9.	Achyranthes Aspera	Achy. asp.	IV
10.	Acidium Oxalicum	Ac. oxal.	III
11.	Acidum Aceticum	Ac. acet.	I
12.	Acidum Benzoicum	Ac. benz.	II
13.	Acidum Boracicum	Ac. boric	III
14.	Acidum Butyricum	Ac. butyr.	III
15.	Acidum Carbolicum	Ac. carbo.	II
16.	Acidum Citricum	Ac. cit.	III
17.	Acidum Gallicum	Ac. gal.	III
18.	Acidum Hydrocyanicum	Asc. hcyan.	III
19.	Acidum Hydrofluoricum	Ac. fluor.	II
20.	Acidum Lacticum	Ac. lact.	III
21.	Acidum Muriaticum	Ac. mur.	I
22.	Acidum Nitricum	Ac. nit.	I
23.	Acidum Nitro Muriaticum	Ac. n.m.	III
24.	Acidum Phosphoricum	Ac. phos.	I
25.	Acidum Picricum	Ac. pic.	II
26.	Acidum Salicylicum	Ac. salic.	II
27.	Acidum Sarcolacticum	Ac. sarco.	II
28.	Acidum Sulphuricum	Ac. sul.	I
29.	Acidum Sulphurosum	Ac. sulphuros.	III
30.	Acidum Tannicum	Ac. tan.	III
31.	Acidum Tartaricum	Ac. tart.	III
32.	Aconitum Napellus	Acon. np.	I
33.	Actaea Spicata	Act. spic.	IV
34.	Adonis Vernalis	Adonis. v.	II
35.	Adrenocorticotrophin	ACTH	IV
36.	Aegle Folia	Aegle f.	IV
37.	Aesculus Glabra	Aescul. g.	V
38.	Aesculus Hippocastanum	Aesc. hip.	I
39.	Aethipos Mercurialis Mineralis	Aeth. mer.	IV
40.	Aethusa Cynapium	Aeth. cy.	I
41.	Agaricus Emeticus	Agaric. e.	V
42.	Agaricus Muscarius	Agar. m.	I

S. No.	Name of the Monograph	Abbreviation	Volume
43.	Agnus Castus	Agn. cast.	I
44.	Ailanthus Glandulosus	Ailan. g.	IV
45.	Alcohol Fortis—Strong Alcohol	Alc.	I
46.	Aletris Farinosa	Alet. f.	II
47.	Alfalfa	Alfa.	II
48.	Allium Cepa	All. cepa.	I
49.	Allium Sativum	All. sat.	I
50.	Aloe Socotrina	Alo. soc.	I
51.	Alstonia Constricta	Alst. con.	V
52.	Alstonia Scholaris	Alst. sc.	IV
53.	Alumen	Alumen	II
54.	Alumina	Alumin.	I
55.	Alumina Phosphorica	Alu. ph.	V
56.	Ambra Grisea	Ambr. gr.	I
57.	Ammonicum Gummi	Amm. gum.	IV
58.	Ammonium Aceticum	Amm. acet.	IV
59.	Ammonium Benzoicum	Am. benz.	III
60.	Ammonium Bromidum (Ammonium Bromatum)	Amm. brom.	III, IV
61.	Ammonium Carbonicum	Am. carb.	I
62.	Ammonium Causticum	Am. caust.	I
63.	Ammonium Iodatum	Amm. iod.	IV
64.	Ammonium Muriaticum	Am. mur.	I
65.	Ammonium Nitricum	Am. nit.	V
66.	Ammonium Phosphoricum	Am. phos.	V
67.	Ammonium Picricum	Am. pic.	V
68.	Amoora Rohituka	Amoora. r.	IV
69.	Ampelopsis Quinquefolia	Amp. quin.	IV
70.	Amygdalus Amara	Amyg. am.	III
71.	Amyl Nitrosum	Am. nit.	I
72.	Anacardium Occidentale	Anac. oc.	V
73.	Anacardium Orientale	Anac. or.	I
74.	Anagallis Arvensis	Anag. ar.	IV
75.	Andrographis Paniculata	Andro. pan.	I
76.	Angustura	Angust.	III
77.	Anilinum	Anili.	III
78.	Anthemis Nobilis	Anth. n.	III
79.	Anthoxantum Odoratum	Anth. odo.	IV
80.	Anthrakokali	Anthko.	IV
81.	Antimonium Iodatum	Ant. iod.	IV
82.	Antimonium Arsenicicum	Ant. ars.	I
83.	Antimonium Crudum	Ant. cr.	I

S. No.	Name of the Monograph	Abbreviation	Volume
84.	Antimonium Oxydatum	Antim. ox.	V
85.	Antimonium Sulphuratum Aureum	Ant. s. aur.	III
86.	Antimonium Tartaricum	Ant. tart	I
87.	Antipyrinum	Antipy.	III
88.	Apis Mellifica	Apis. mel.	I
89.	Apium Graveolens	Apium gr.	II
90.	Apocynum Androsaemifolium	Ap. andro.	III
91.	Apocynum Cannabinum	Apoc. can.	I
92.	Apomorphinum Muriaticum	Apo. mur.	III
93.	Aralia Racemosa	Aral. rac.	I
94.	Aranea Diadema	Aran. d.	II
95.	Argentum Cynatum	Arg. cy.	IV
96.	Argentum Iodatum	Arg. iod.	IV
97.	Argentum Metallicum	Arg. met.	I
98.	Argentum Muriaticum	Arg. mur.	III
99.	Argentum Nitricum	Arg. nit.	I
100.	Aristolochia Clematitis	Arist. cl.	IV
101.	Aristolochia Serpentaria	Aris. s.	III
102.	Arnica Montana	Arn. mont.	I
103.	Arsenicum Album	Ars. alb.	I
104.	Arsenicum Hydrogenatum	Ars. hyd.	IV
105.	Arsenicum Iodatum	Ars. iod.	I
106.	Arsenicum Metallicum	Ars. met.	III
107.	Arsenicum Sulphuratum Flavum	Ars. s. f.	I
108.	Arsenicum Sulphuratum Rubrum	Ars. s. r.	I
109.	Artemisia Vulgaris	Art. vul.	I
110.	Arum Dracontium	Arum. d.	IV
111.	Arum Maculatum	Arum. mac.	IV
112.	Arum Triphyllum	Arum. tri.	I
113.	Asafoetida	Asaf.	I
114.	Asarum Canadensis	Asar. can.	II
115.	Asarum Europaeum	Asar. eur.	IV
116.	Asclepias Tuberosa	Ascl. tub.	III
117.	Asparagus Officinalis	Asp. off.	V
118.	Asterias Rubens	Ast. rub.	IV
119.	Atropinum	Atropin	III
120.	Atropinum Sulphuricum	Atr. sul.	IV
121.	Aurum Metallicum	Aur. met.	I
122.	Aurum Muriaticum	Aur. mur.	I
123.	Aurum Muriaticum Natronatum	Aur. m. n.	II
124.	Aurum Sulphuratum	Aur. sul.	V
125.	Avena Sativa	Aven. sat.	I
126.	Azadirachta Indica	Azad. ind.	I
127.	Badiaga	Badiaga	III

S. No.	Name of the Monograph	Abbreviation	Volume
128.	Balsum Peru	Bals. p.	III
129.	Baptisia Tinctoria	Bapt.	I
130.	Barium Sulphuricum	Bar. sul.	V
131.	Barosma Crenata	Bar. cren.	V
132.	Baryta Acetica	Bar. acet.	IV
133.	Baryta Carbonica	Bar. carb.	I
134.	Baryta Iodata	Bar. iod.	IV
135.	Baryta Muriatica	Bar. mur.	I
136.	Belladonna	Bell.	I
137.	Bellis Perennis	Bel. per.	I
138.	Benzenum	Benzen.	III
139.	Benzinum Nitricum	Benz. nit.	V
140.	Berberies Aquifolium	Berb. aq.	III
141.	Berberis Vulgaris	Berb. vul.	I
142.	Beryllium Metallicum	Be. metal.	V
143.	Bismuthum Oxydatum	Bis. ox.	III
144.	Bismuthum Subnitricum	Bism. sub.	II
145.	Blatta Orientalis	Blat.	I
146.	Blumea Odorata	Blam. odo.	IV
147.	Boerhaavia Diffusa	Boer. dif.	I
148.	Borax	Borax	I
149.	Bovista	Bovist.	I
150.	Brachyglottis Repens	Brac. rep.	V
151.	Branca Ursina	Branca	V
152.	Bromium	Brom.	II
153.	Bryonia Alba	Bry. alba.	I
154.	Bufo Rana	Bufo. ran.	I
155.	Cactus Grandiflorus	Cact. grn.	I
156.	Cadmium Metallicum	Cad. met.	II
157.	Cadmium Sulphuratum	Cad. sulph.	III
158.	Cadmium Sulphuricum	Cad. sul.	II, IV
159.	Caffeinum	Caffein.	III
160.	Caladium Seguinum	Cal. seg.	IV
161.	Calcarea Acetica	Calc. ace.	III
162.	Calcarea Arsenicosa	Cal. ars.	I
163.	Calcarea Bromata	Calc. bro.	III
164.	Calcarea Carbonica	Cal. carb.	I
165.	Calcarea Caustica	Cal. caus.	III
166.	Calcarea Fluorica	Cal. fl.	I
167.	Calcarea Hypophosphorosa	Calc. hyp.	III
168.	Calcarea Iodata	Cal. iod.	II
169.	Calcarea Muriatica	Calc. mur.	V

S. No.	Name of the Monograph	Abbreviation	Volume
170.	Calcarea Ova Testa	Ova. t.	IV
171.	Calcarea Oxalica	Cal. oxal.	IV
172.	Calcarea Phosphorica	Cal. phos.	I
173.	Calcarea Sulphurica	Cal. sul.	I
174.	Calendula Officinalis	Calend.	I
175.	Calotropis Gignatia	Calot. gig.	I
176.	Caltha Palustris	Cal. pal.	V
177.	Camphora	Camph.	I
178.	Cannabis Indica	Can. ind.	I
179.	Cannabis Sativa	Can. sat.	I
180.	Cantharis	Canthr.	I
181.	Capsicum Annuum	Cap. a.	II
182.	Carbo Animalis	Carbo. an.	I
183.	Carbo Vegetabilis	Carbo. veg.	I
184.	Carbonium Sulphuratum	Carb. sul.	II
185.	Carduus Marianus	Card. mar.	I
186.	Carica Papaya	Carica p.	II
187.	Cascara Sagrada	Cascar. s.	II
188.	Cascarilla	Cascar.	III
189.	Castanea Vesca	Cast. ves.	III
190.	Castoreum	Castor.	III
191.	Caulophyllum Thalictroides	Caulph.	I
192.	Causticum	Caust.	I
193.	Ceanothus Americanus	Ceano. am.	I
194.	Cedron	Cedron	IV
195.	Cephalandra Indica	Ceph. ind.	IV
196.	Chamomilla	Cham.	I
197.	Chelidonium Majus	Chel. maj.	I
198.	Chelone Glabra	Ch. glab.	IV
199.	Chenopodium Anthelminticum	Chenop. a.	II
200.	Chimaphila Umbellata	Chimap. u.	II
201.	Chininum Arsenicosum	Chin. ars.	I
202.	Chininum Muriaticum	Chin. m.	III
203.	Chininum Sulphuricum	Chin. sul.	I
204.	Chionanthus Virginica	Chion. v.	III
205.	Chloralum	Chloral.	II
206.	Chloroformum	Chlorf.	V
207.	Chlorum	Chlorum	V
208.	Cholesterinum	Cholest.	II
209.	Chrysarobinum	Chrys.	V
210.	Cicuta Virosa	Cic. vir.	I
211.	Cimex Lectularius	Cimex. l.	III
212.	Cimicifuga Racemosa	Cim. rac.	I
213.	Cina	Cina	I

S. No.	Name of the Monograph	Abbreviation	Volume
214.	Cinchona Officinalis	Cinc. of.	I
215.	Cineraria Maritima	Cin. mar.	V
216.	Cinnabaris	Cinbar.	III
217.	Cinnamomum	Cinam.	II
218.	Cistus Canadensis	Cist. can.	IV
219.	Clematis Erecta	Clem. er.	IV
220.	Cobaltum Metallicum	Cob. met.	II
221.	Cobaltum Nitricum	Cob. nit.	II
222.	Coca	Coca	II
223.	Cocanium Muriaticum	Coca. mur.	V
224.	Cocculus Indicus	Coc. ind.	I
225.	Coccus Cacti	Coc. cac.	II
226.	Cochlearia Armoracia	Coch. ar.	III
227.	Codeinum	Codein.	III
228.	Coffea Cruda	Coff. cr.	I
229.	Colchicum Autumnale	Colch. at.	I
230.	Collinsonia Canadensis	Collin. c.	II
231.	Colocynthis	Coloc.	I
232.	Comocladia Dentata	Com. dent.	V
233.	Conium Maculatum	Con. mac.	I
234.	Convallaria Majalis	Conval. m.	II
235.	Copaiba Officinalis	Copaiba	III
236.	Cornus Florida	Cor. f.	III
237.	Crataegus Oxyacantha	Crat. oxy.	I
238.	Crocus Sativus	Croc. s.	II
239.	Crotalus Horridus	Crot. hor.	II
240.	Croton Tiglium	Crot. tig.	I
241.	Cubeba Officinalis	Cubeb. of.	III
242.	Cucurbita Pepo	Cucur. p.	IV
243.	Cundurango	Cundu.	II
244.	Cuprum Aceticum	Cup. acet.	III
245.	Cuprum Arsenicosum	Cup. ars.	I
246.	Cuprum Metallicum	Cup. met.	I
247.	Cuprum Sulphuricum	Cup. s.	III
248.	Curare	Curare	IV
249.	Curcuma Longa	Curcuma	V
250.	Cyclamen Europaeum	Cycl. eur.	IV
251.	Cynodon Dactylon	Cynod. d.	II
252.	Cypripedium Pubescens	Cypr. pub.	V
253.	Damiana	Damian.	II
254.	Daphne Indica	Daph. ind.	IV
255.	Digitalis Purpurea	Dig. pur.	I
256.	Dioscorea Villosa	Dios. vil.	I
257.	Diphtherinum	Diphth.	IV

S. No.	Name of the Monograph	Abbreviation	Volume
258.	Dolichos	Dolich.	III
259.	Drosera Rotundifolia	Dros. rot.	I
260.	Duboisia Myoporides	Dub. myop.	V
261.	Dulcamara	Dulc.	I
262.	Echinacea Angustifolia	Echin. an.	I
263.	Elaps Corallinus	Elapse. c.	II
264.	Elaterium	Elet.	IV
265.	Embelia Ribes	Embe. r.	II
266.	Epiphagus Virginiana	Epi. vir.	V
267.	Equisetum Hyemale	Equis. hy.	II
268.	Erigeron Canadense	Erig. can.	IV
269.	Eriodictyon Glutinosum	Erio. g.	III
270.	Eryngium Aquaticum	Eryn. aq.	IV
271.	Eucalyptus Globulus	Eucal. gl.	II
272.	Euonymus Atropurpurea	Euony. a.	III
273.	Eupatorium Perfoliatum	Eup. perf.	I
274.	Eupatorium Purpurium	Eup. pur.	IV
275.	Euphorbia Corollata	Euphor. c.	V
276.	Euphorbium	Euphorb	III
277.	Euphrasia Officinalis	Euph. of.	I
278.	Eupionum	Eupion.	V
279.	Fagopyrum Esculentum	Fago. esc.	IV
280.	Ferrum Magneticum	Fer. mag.	V
281.	Ferrum Sulphuricum	Fe. sulph.	III
282.	Ferrum Arsenicicum	Fer. ars.	IV
283.	Ferrum Iodatum	Fer. iod.	IV
284.	Ferrum Metallicum	Fer. met.	I
285.	Ferrum Muriaticum	Fer. mur.	IV
286.	Ferrum Phosphoricum	Fer. phos.	I
287.	Ficus Religiosa	Ficus rl.	I
288.	Filix Mas	Filix m.	II
289.	Fraxinus Americana	Frax. am.	IV
290.	Fucus Vesiculosus	Fucus. v.	III
291.	Gambogia	Gambog.	III
292.	Gaultheria Procumbens	Gal. proc.	V
293.	Gelsemium Sempervirens	Gels.	I
294.	Gentiana Cruciata	Gent. c.	V
295.	Gentiana Lutea	Gent. lut.	III
296.	Geranium Maculatum	Gern. mac.	I
297.	Ginseng	Ginseng	III
298.	Glonoinum	Glon.	II
299.	Gnaphalium Polycephalum	Gnap. p.	IV
300.	Gossypium Herbaceum	Gossy. h.	II
301.	Granatum	Granat.	III

S. No.	Name of the Monograph	Abbreviation	Volume
302.	Graphites	Graph.	I
303.	Gratiola Officinalis	Grat. off.	V
304.	Grindelia Robusta	Grind. ro.	III
305.	Guaiacum	Guaic.	II
306.	Guarea Trichiloides	Gua. tri.	IV
307.	Gymnema Sylvestre	Gymn. syl.	I
308.	Haematoxylon Campechianum	Haemat. c.	III
309.	Hamamelis Virginica	Ham. virg.	I
310.	Hedera Helix	Hed. hel.	V
311.	Helianthus Annus	Hel. ann.	V
312.	Helleborus Niger	Hell. nig.	I
313.	Helonias Dioica	Helon.	III
314.	Hepar Sulphur	Hep. sul.	I
315.	Holarrhena Antidysenterica	Hol. andy.	I
316.	Hydrangea Abrorescens	Hydrang.	III
317.	Hydrastis Canadensis	Hydr. can.	I
318.	Hydrocotyle Asiatica	Hydro. as.	I
319.	Hyoscyaminum	Hyosm.	V
320.	Hyoscyamus Niger	Hyos. nig.	I
321.	Hypericum Perforatum	Hyper.	I
322.	Iberis Amara	Iber. am.	IV
323.	Ichthyolum	Ichthyo.	II
324.	Ignatia Amara	Ign.	I
325.	Illicium Anisatum	Illi. a.	III
326.	Indium Metallicum	Ind. met.	IV
327.	Inula	Inula	III
328.	Iodium	Iod.	I
329.	Iodoformum	Iodof.	V
330.	Ipecacuanha	Ipecac.	I
331.	Iridium Metallicum	Ir. met.	IV
332.	Iris Versicolor	Iris. ver.	II
333.	Jaborandi	Jab.	II
334.	Jalapa	Jal.	II
335.	Janosia Ashoka	J. ashok.	I
336.	Jatropha Curcas	Jat. curc.	IV
337.	Juglans Regia	Jug. reg.	IV
338.	Jugulans Cinerea	Jug. cin.	IV
339.	Juncus Effusus	Juncus	V
340.	Juniperus Communis	Junip. c.	II
341.	Justicia Adhatoda	Just. ad.	I
342.	Kali Chromicum	Kali. chr.	V
343.	Kali Ferrocyanatum	Kali. fer.	IV
344.	Kali Picricum	Kali pic.	IV

S. No.	Name of the Monograph	Abbreviation	Volume
345.	Kali Aceticum	Kali. ace.	IV
346.	Kali Bichromicum	Kali. Bich.	I
347.	Kali Bromatum	Kali. br.	II
348.	Kali Carbonicum	Kali. carb.	I
349.	Kali Chloricum	Kali. chl.	III
350.	Kali Cyanatum	Kali. cy.	II
351.	Kali Iodatum	Kali. iod	I
352.	Kali Muriaticum	Kali mur.	I
353.	Kali Nitricum	Kali. nit.	IV
354.	Kali Oxalicum	Kali ox.	III
355.	Kali Permanganicum	Kali per.	III
356.	Kali Phosphoricum	Kali. phos.	I
357.	Kali Sulphuricum	Kali. sul.	I
358.	Kali Tartaricum	Kali tar.	III
359.	Kalmia Latifolia	Kalm. lat.	IV
360.	Kreosotum	Kreos.	I
361.	Lac Vaccinum	Lac. vac.	IV
362.	Lac Vaccinum Defloratum (Lac Defloratum)	Lac. def.	IV
363.	Lachesis	Lach.	I
364.	Lachnanthes Tinctoria	Lach. tin.	IV
365.	Lappa Major	Lap. maj.	III
366.	Lathyrus Sativus	Lat. sat.	IV
367.	Laurocerasus	Lauroc.	IV
368.	Ledum Palustre	Led. pal.	I
369.	Lemna Minor	Lemna m.	IV
370.	Leptandra	Leptan.	III
371.	Lithium Benzoicum	Lith. ben.	V
372.	Lithium Carbonicum	Lith. carb.	II
373.	Lobelia Cardinalis	Lob. card.	V
374.	Lobelia Inflata	Lob. in.	II
375.	Lolium Temulentum	Lol. tem.	V
376.	Lupulus	Lupul.	III
377.	Lycopersicum Esculentum	Lyco. es.	V
378.	Lycopodium Clavatum	Lyco.	I
379.	Lycopus Virginicus	Lycop. v.	IV
380.	Magnesia Carbonica	Mag. carb.	I
381.	Magnesia Muriatica	Mag. mur.	I
382.	Magnesia Sulphurica	Mag. sul.	II
383.	Magnesium Phosphoricum	Mag. phos.	II
384.	Mancinella	Mancin.	V
385.	Manganum Carbonicum	Mang. carb.	IV
386.	Manganum Aceticum	Mng. acet.	II

S. No.	Name of the Monograph	Abbreviation	Volume
387.	Manganum Muriaticum	Mng. Mur.	V
388.	Manganum Oxydatum Nigrum	Mang. oxy.	V
389.	Medorrhinum	Medor.	IV
390.	Melilotus Alba	Mel. alb.	II
391.	Mentha Piperita	Men. pip.	II
392.	Menyanthes Trifoliata	Menyan. t.	II
393.	Mercurialis Perennis	Mer. per.	IV
394.	Mercurius Cyanatus	Merc. cy.	IV
395.	Mercurius Corrosivus	Merc. cor.	I
396.	Mercurius Dulcis	Merc. dul.	I
397.	Mercurius Et Kali Iodatus	Merc. ki.	V
398.	Mercurius Iodatus Flavus	Merc. i. f.	I
399.	Mercurius Iodatus Ruber	Merc. i. r.	I
400.	Mercurius Nitricus	Merc. nit.	V
401.	Mercurius Solubilis	Merc. sol.	I
402.	Mercurius Vivus	Merc. viv.	IV
403.	Mezereum	Mez.	I
404.	Millefolium	Millef.	IV
405.	Morphinum Muriaticum	Morph. m.	II
406.	Moschus	Mosc.	II
407.	Murex Purpurea	Murex. p.	III
408.	Mygale	Mygal.	III
409.	Myrica Cerifera	Myri. cer.	I
410.	Myrtus Communis	Myrt. com.	IV
411.	Naja Tripudians	Naja. t.	II
412.	Naphthalinum	Naphth.	IV
413.	Narceinum	Narc.	IV
414.	Narcotinum	Narcot.	V
415.	Natrum Bromatum	Nat. brom.	V
416.	Natrum Chloratum	Nat. chl.	V
417.	Natrum Iodatum	Nat. iod.	V
418.	Natrum Silicatum	Nat. sil.	V
419.	Natrum Sulphurosum	Nat. sulph.	V
420.	Natrum Arsenicum	Nat. ars.	IV
421.	Natrum Carbonicum	Nat. carb.	I
422.	Natrum Muriaticum	Nat. mur.	I
423.	Natrum Nitricum	Nat. nit.	IV
424.	Natrum Phosphoricum	Nat. phos.	I
425.	Natrum Salicylicum	Nat. sal.	II
426.	Natrum Sulphuricum	Nat. sul.	I
427.	Niccolum Carbonicum	Nic. carb.	V
428.	Niccolum Metallicum	Nic. met.	V

S. No.	Name of the Monograph	Abbreviation	Volume
429.	Nitri Spiritus Dulcis	Nit. s. d.	IV
430.	Nux Moschata	Nux. mos.	I
431.	Nux Vomica	Nux. vom.	I
432.	Nyctanthes Arbortristis	Nyct. arb.	III
433.	Nymphaea Odorata	Nym. odo.	V
434.	Ocimum Sanctum	Oci. sant.	I
435.	Oenanthe Crocata	Oen. croc.	V
436.	Oleander	Oleand.	III
437.	Oleum Animale	Ol. anim.	IV
438.	Oleum Santali	Ol. santal.	II
439.	Opium	Opium	I
440.	Paeonia Officinalis	Paeon. of.	IV
441.	Palladium	Pallad.	V
442.	Pareira Brava	Pareira	III
443.	Paris Quadrifolia	Paris q.	IV
444.	Passiflora Incarnata	Passi. in.	II
445.	Pastinaca	Pastin.	V
446.	Paullinia Pinnata	Paul. p.	V
447.	Petroleum	Petrol.	I
448.	Petroselinum Sativum	Petr. sat.	IV
449.	Phellandrium Aquaticum	Phel. aq.	V
450.	Phosphorus	Phosph.	I
451.	Physostigma Venenosum	Physo. v.	II
452.	Phytolacca	Phyto.	I
453.	Picrotoxinum	Picro.	V
454.	Pilocarpinum Muriaticum	Pil. mur.	V
455.	Pinus Sylvestris	Pin. syl.	V
456.	Piper Methysticum	Piper. m.	III
457.	Piper Nigrum	Piper. n.	III
458.	Piscidia	Piscid.	III
459.	Plantago Major	Plant. m.	II
460.	Platinum Muriaticum	Plat. mur.	V
461.	Platinum Metallicum	Plat. met.	I
462.	Plumbum Aceticum	Pl. acet.	V
463.	Plumbum Chromicum	Pb. ch.	V
464.	Plumbum Metallicum	Pb. met.	I
465.	Podophyllum Peltatum	Podo.	I
466.	Polygonum Punctatum	Poly. pun.	IV
467.	Polyporus Officinalis	Poly. off.	IV
468.	Populus Candicans	Pop. can.	III
469.	Populus Tremuloides	Pop. trem.	V
470.	Pothos Foetidus	Poth. foe	IV
471.	Prunus Padus	Prun. pad.	V
472.	Prunus Spinosa	Prunus. s.	IV

S. No.	Name of the Monograph	Abbreviation	Volume
473.	Prunus Virginiana	Prun. v.	III
474.	Psoralea Corylifolia	Psorl. cor.	I
475.	Ptelea Trifolia	Ptel. tri.	IV
476.	Pulsatilla Nigricans	Puls.	I
477.	Purified Water	—	I
478.	Pyrus	Pyrus	V
479.	Radium Bromide	Rad. br.	V
480.	Ranunculus Acris	Ran. acri.	V
481.	Ranunculus Bulbosus	Ran. bulb.	IV
482.	Ranunculus Sceleratus	Renun. s.	IV
483.	Raphanus Sativus	Raph. sat.	V
484.	Ratanhia	Ratan.	II
485.	Rauvolfia Serpentina	Rau. serp.	I
486.	Rhamnus Catharticus	Rha. cath.	V
487.	Rhamnus Frangula	Rham. fr.	III
488.	Rheum	Rheum	II
489.	Rhododendron Chrysanthum	Rhodo. ch.	II
490.	Rhus Toxicodendron	Rhus. tox.	I
491.	Rhus Venenata	Rhus. ven.	II
492.	Ricinus Communis	Ric. com.	III
493.	Robina Pseudocacia	Robinia	V
494.	Rumex Crispus	Rumex c.	II
495.	Ruta Graveolens	Ruta.	I
496.	Sabadilla	Sabad.	I
497.	Sabal Serrulata	Sab. ser.	II
498.	Sabina	Sabin.	I
499.	Saccharum Lactis	Sac. lac.	I
500.	Salix Nigra	Salix. n.	II
501.	Salix Purpurea	Salix. p.	III
502.	Sambucus Nigra	Samb. nig.	II
503.	Sanguinaria Canadensis	Sang. ca.	I
504.	Santoninum	Santon.	V
505.	Sarracenia Purpurea	Sarr. pur.	IV
506.	Sarsaparilla	Sarsap.	III
507.	Scutellaria	Scutel.	III
508.	Secale Cornutum	Sec. cor.	I
509.	Selenium	Selen.	I
510.	Senecio Aureus	Sen. aur.	II
511.	Senega	Seneg.	I
512.	Senna	Senna	III
513.	Sepia	Sepia	I
514.	Silicea	Sil.	I
515.	Sinapis Alba	Sinap. al.	III
516.	Sinapis Nigra	Sinap. n.	III

S. No.	Name of the Monograph	Abbreviation	Volume
517.	Solanum Carolinense	Sol. caro.	V
518.	Solanum Nigrum	Sol. nig.	II
519.	Solidago Virgaurea	Sol. vir.	V
520.	Spigelia	Spig.	II
521.	Spongia Tosta	Spong. to.	I
522.	Squilla	Squil.	III
523.	Stannum Metallicum	Stan. met.	I
524.	Staphysagria	Staph.	I
525.	Sterculia Accuminata	Ster. ac.	V
526.	Sticta Pulmonaria	Sticta p.	IV
527.	Stillingia Sylvatica	Stil. syl.	III
528.	Stramonium	Stram.	II
529.	Strontium Carobonicum	Str. carb.	V
530.	Strophanthus Hispidus	Stro. his.	II
531.	Strychninum Nitricum	Stry. nit.	V
532.	Strychninum Phosphoricum	Stry. phos.	V
533.	Strychninum Sulphuricum	Stry. sul.	V
534.	Sulphanilamide	Sulamid.	V
535.	Sulphur	Sulph.	I
536.	Sulphur Iodatum	Sul. iod.	I
537.	Sumbul	Sumbul	II
538.	Symphoricarpus Racemosus	Sym. rac.	V
539.	Symphytum Officinale	Symph. of.	III
540.	Syphillinum	not in book	IV
541.	Syzygium Jambolanum	Syz. jam.	I
542.	Tabacum	Tabac.	I
543.	Tamus Communis	Tamus c.	V
544.	Tanacetum Vulgare	Tan. vulg.	V
545.	Taraxacum	Tarax.	III
546.	Tarentula Hispana	Tarent. h.	II
547.	Taxus Baccata	Tax. Bac.	III
548.	Tellurium	Telluri	II
549.	Terebinthinae Oleum	Tereb. o.	II
550.	Terminalia Arjuna	Term. arj.	I
551.	Terminalia Chebula	Term. ch.	II
552.	Teucrium Marum Virum	Teuc. m. v.	IV
553.	Thallium	Thal.	V
554.	Thea Chinensis	Thea	V
555.	Theridion	Therid.	III
556.	Thiosinaminum	Thiosin.	V
557.	Thlapsi Bursa Pastoris	Thal. b. p.	V
558.	Thuja Occidentalis	Thuja.	I
559.	Thymolum	Thymol	V
560.	Thyroidinum	Thyroid	III

S. No.	Name of the Monograph	Abbreviation	Volume
561.	Tilia Europaea	Til. euro.	V
562.	Tinospora Cordifolia	Tinospo.	II
563.	Titanium	Titan.	V
564.	Tongo	Tongo	III
565.	Tribulus Terrestris	Trib. ter.	I
566.	Trifolium Paratense	Tri. prat.	V
567.	TriticuIm Repens	Trit. rep.	III
568.	Tuberculinum	Tuberc.	IV
569.	Tussilago Petasites	Tuss. pet.	V
570.	Tussilago Farfara	Tuss. far.	IV
571.	Uranium Nitricum	Uran. nit.	V
572.	Urtica Urens	Urt. u.	IV
573.	Usnea Barbata	Usnea b.	V
574.	Ustilago Maydis	Ust. m.	III
575.	Uva Ursi	Uva. ur.	III
576.	Valeriana Officinalis	Valer. of.	II
577.	Veratrum Album	Ver. alb.	II
578.	Veratrum Viride	Vert. vir.	I
579.	Verbascum Thapsus	Verb. th.	II
580.	Viburnum Opulus	Vib. op.	II
581.	Viburnum Prunifolium	Vib. p.	II
582.	Vinca Minor	Vinc. min.	IV
583.	Viola Odorata	Viola od.	IV
584.	Viola Tricolor	Viola t.	IV
585.	Vipera Torva	Viper. t.	II
586.	Viscum Album	Vis. alb.	II
587.	Withania Somnifera	With. som.	I
588.	Xanthozylum Fraxineum	Xanth. f.	III
589.	Yucca Filamentosa	Yuc. fila.	V
590.	Zincum Aceticum	Zinc . ac.	V
591.	Zincum Bromatum	Zine. br.	V
592.	Zincum Metallicum	Zinc. met.	I
593.	Zincum Muriaticum	Zinc. mur.	V
594.	Zincum Oxydatum	Zinc. ox.	V
595.	Zincum Phosphoratum	Zinc. phos.	V
596.	Zincum Sulphuricum	Zinc. sul.	II
597.	Zincum Valerianicum	Zinc. val.	V

HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H.P.I.)

VOLUME – I

FIRST EDITION

1971



GOVERNMENT OF INDIA
MINISTRY OF HEALTH

F O R E W O R D

The Government of India was pleased to constitute the Homoeopathic Pharmacopoeia Committee vide their letter No. F. 23-2/62-ISM, dated the 22nd September, 1962. The term of the Committee initially was three years. Subsequently it was extended from time to time. The functions of the Committee are given below:

(i) to prepare a Pharmacopoeia of Homoeopathic drugs, whose therapeutic usefulness has been proved, on the lines of the American, German and British Pharmacopoeiae;
(ii) to lay down principles and standards for the preparation of homoeopathic drugs;
(iii) to lay down tests for identity, quality and purity; and
(iv) such other matter as are incidental and necessary for the preparation of a Homoeopathic pharmacopoeia.

So far the Committee held twelve meetings. After these deliberations, the Committee finalised the First Volume of the Homoeopathic Pharmacopoeia of India. The First Volume consists of:

(i) Preface,
(ii) Introduction,
(iii) Historical,
(iv) General Notices,
(v) Abbreviations,
(vi) Monographs (180); and
(vii) Appendices (I to XIX).

The First Volume of the Homoeopathic Pharmacopoeia of India is presented herewith to the Government of India.

(DR. K. G. SAXENA)
Member-Secretary,
Homoeopathic Pharmacopoeia Committee.

NEW DELHI, THE 28TH JULY, 1970.

(DR. B. K. SARKAR)
Chairman,
Homoeopathic Pharmacopoeia Committee.

CALCUTTA, THE 4TH AUGUST, 1970.

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PREFACE

The proposal to set up a Homoeopathic Pharmacopoeia Committee was initiated by the Homoeopathic Advisory Committee in the year 1956 and it was supported by most of the members of the Committee. This was discussed at various meeting of the Advisory Committee from 1956 to 1962. In September, 1961, the Homoeopathic Sub-Committee of the Drugs Technical Advisory Board while considering the questing of control of Homoeopathic medicines under the Drugs Rules, expressed the opinion that the Homoeopathic Advisory Committee's recommendation for the preparation of an Homoeopathic Pharmacopoeia of India should be duly considered by the Government. This view was again reiterated by the Homoeopathic Advisory Committee meeting in December, 1961, at New Delhi. Dr. K. G. Saxena was appointed Honorary Homoeopathic Adviser to the Government in May, 1962 and he took up this task of setting up a Homoeopathic Pharmacopoeia Committee from the beginning. The Govt. of India, Ministry of Health, having reconsidered the earlier recommendation of the Committee agreed to constitute the Committee. Thus the Homoeopathic Pharmacopoeia Committee was set up in September, 1962, with the following objects :

(i) to prepare a Pharmacopoeia of Homoeopathic drugs whose therapeutic usefulness has been proved, on the lines of the American, German and British Homoeopathic pharmacopoeia;

(ii) to lay down principles and standards for the preparations of Homoeopathic drugs;

(iii) to lay down tests of identity, quality, purity; and

(iv) such other matters as are incidental and necessary for the preparation of Homoeopathic pharmacopoeia.

The term of the Committee initially was three years. Subsequently it was extended from time to time. The composition of the Committee has been as follows :

Chairman	Dr. B. K. Sarkar, M. B. (Cal), D. M. S. (Ex. Principal, Midnapore Homoeopathic Medical College), Calcutta.
Member	Dr. S. R. Wadia, M.B.B.S., M.F. Hom. (Lond), Chairman, Maharashtra Homoeopathic Board, Bombay.
Member	Dr. Diwan Harish Chand, M.B.B.S., L.R.C.P. (Edin) D.T.M. & H. (L'pool), F.F. Hom. (Lond), National Vice-President, International Homoeopathic League, New Delhi.
Member	Dr. S. Raman, B.A., H.M.B., Homoeopathic Physician, Madras.
Member	Dr. S. Bhattacharya B. Sc. Homoeopathic Manufacturing Pharmacist, Calcutta (upto 1967).
Member	Dr. Shanti Dev. B.Sc., L.A.M.S., M.H.M.S., D.M.S., Ex-Lecturer, National Homoeopathic Medical College, Lucknow (upto 1967).
Member	Shri G. S. Bhar, B.Sc., Homoeopathic Manufacturing Pharmacist, Calcutta.

Member	Shri P. N. Varma, B.Sc., M.Sc., (Tech-Pharma) Homoeopathic Manufacturing Pharmacists, Patna (Bihar) (from 1967)
Member	Shri S. K. Borkar, M.Sc., Ex-Drugs Controller, India, now Adviser (Pharmaceutical) Indian Drugs & Pharmaceutical Ltd., New Delhi (from 1967).
Member	Gowripathy Row, L.H.M.S., Homoeopathic Practitioner, Razole (Andhra) (from 1967).
Member	Drugs Controller, India, Shri P. S. Ramachandran, M.Sc. (from 1968).
Member	Director, Central Drugs Laboratory, Calcutta : Dr. D. Ghosh, M.Sc. Ph.D. (Wis), F.R.I.C.(Lond). (from 1968).
Member-Secretary	Dr. K. G. Saxena, B.M.B.S., Adviser in Homoeopathy, Govt. of India, New Delhi.

The Committee appointed the following Sub-Committees to assist in the compilation of the Homoeopathic Pharmacopoeia of India :

(1) Drug List Sub-Committee : Dr. Diwan Harish Chand, Dr. S. Raman and Dr. K. G. Saxena.

(2) Pharmacognosy Sub-Committee : Dr. B. K. Sarkar (Chairman), Dr. Diwan Harish Chand, Dr. S. R. Wadia, Dr. S. Raman, Dr. S. Bhatacharya (1962 - 67) (since deceased), Dr. S. M. Sarkar, D.Sc. (Co-opted Member, 1966 – 1968), Dr. D. Chakravarty, D.Sc. F.N.I. (Co-opted Member, 1966 – 1968) and Dr. K. G. Saxena.

(3) Drug Preparation and Standardisation Sub-Committee : Dr. B. K. Sarkar (Chairman), Dr. Shanti Dev (1966 – 67), Dr. S. Bhattacharya (1962 – 67) (since deceased), Shri G. S. Bhar and Dr. K. G. Saxena.

In order to expedite the compilation of the first volume of the Pharmacopoeia, the Committee constituted a Working Group consisting of :-

Dr. B. K. Sarkar (Chairman), Dr. P. N. Varma, Shri G. S. Bhar and Dr. K. G. Saxena in November, 1968, to scrutinize the material already collected and to finalise the same quickly.

To assist the Homoeopathic Pharmacopoeia Committee the following technical and secretariat staff was appointed :

Dr. K. P. Muzumdar, (Research Officer, Homoeopathy), Shri R. Ganapati (Chemist), Dr. B. S. Ahuja (Botanist), Shri Ghisa Ram, Assistant Secretary (Administrative), Dr. R. P. Saxena (Research Assistant, Homoeopathy), Shri Vikramaditya (Research Assistant, Botany).

I N T R O D U C T I O N

The first meeting of the Homoeopathic Pharmacopoeia Committee, was held in November, 1962, when all preliminary matters relating to preparation of the Homoeopathic Pharmacopoeia of India were discussed. The Committee decided to circulate a questionnaire on the Pharmacopoeia, to all leading Homoeopathic Pharmacists and eminent Homoeopaths in India as well as abroad. A Sub-Committee was formed to draw up a list of drugs to be included in the Pharmacopoeia. Taking into consideration the various comments received and the decisions taken at different meetings, this list was finalised in March, 1967. As the list of the approved Homoeopathic drugs numbered more than two thousand, it was decided to include them into Homoeopathic in stages. The Committee selected, for inclusion in first volume one hundred and eighty important common drugs. Draft monographs on these drugs were prepared and were circulated to the members of the Committee and interested manufacturers. After taking into consideration the views expressed by the members and the manufacturers these monographs were finalised and approved by the Committee.

The general notices, general instructions and the appendices were prepared after discussions by the members at several meetings and were then finalised and approved by the Committee.

A number of indigenous drugs whose preparations are manufactured in the country have been included.

List of drugs included in First Volume of the Homoeopathic Pharmacopoeia of India is annexed (Page 27).

In Homoeopathy the drugs used are those mentioned in the original proving as far as possible. As standards for such drugs are not readily available in all cases and further laboratory work is essential for this purpose, this work has been taken up and the additional standards compiled will be duly incorporated in a supplement.

The general pattern of monographs is almost similar to that followed in other Pharmacopoeias and the following are the special features.

The titles of the monographs have been given in the conventional Latin name adopted by the Homoeopathic profession and other names have been included under ‘synonyms’.

The names of the drugs in Indian languages have been given in a separate appendix XIX (page 256).

Description, identification tests as well as method of assay, wherever purity is established, have been furnished for most of the drugs of chemical origin.

The preparation of the Homoeopathic mother tincture or substance follows immediately after details on the parent drug. Both the old (Hahnemannian) and the New methods of drug preparation as in American Homoeopathic Pharmacopoeia have been incorporated, since the Committee observed that both the methods are being adopted by the industry in this country and

the merits of either of them have not yet been scientifically evaluated to arrived at a conclusion in favour of one or the other method exclusively.

The various details under the General Instructions have been laid down taking into consideration the practice of the manufacturers in this country.

In the course of compiling this Pharmacopoeia, the Indian Pharmacopoeia, the American Homoeopathic Pharmacopoeia, the British Homoeopathic Pharmacopoeia, the Homoeopathic Pharmacopoeia of the United States and the German Homoeopathic Pharmacopoeia have been consulted. The Homoeopathic Pharmacopoeia Committee expresses its thanks to the Commissions or authorities who have issued these publications. The Committee expresses its gratefulness to the Homoeopathic manufacturing Pharmacists who have extended their valuable co-operation and actively assisted in the preparation of this volume.

The Homoeopathic Pharmacopoeia Committee also places on record the appreciation of the work done by the members of the various sub-committees and the staff in bringing out this volume.

The Committee is grateful in particular to the Drugs Controller (India), the Director, Central Drugs Laboratory, Calcutta and Director, Central Indian Pharmacopoeial Laboratory, Ghaziabad who have from time to time offered their valuable suggestions and co-operation.

H I S T O R I C A L

Homoeopathy: Homoeopathy, as a specialized method of drug therapy is a therapeutic method of curing the *natural sufferings* of a man by the administration of drugs which have been experimentally proved to possess power of producing *similar, artificial suffering* in a healthy human being. In short, it is a medicine of likes, according to a law of therapeutics, known as "Similia Similibus Curentur" (let likes be treated by likes).

Drug Proving: Controlled experiments made upon relatively healthy human volunteers with substances prepared according to pharmaceutical technique peculiar to Homoeopathy, in varying doses, produce "provings" which constitute the basis of Homoeopathic Materia Medica.

Such provings are carried only to the extent of causing gross temporary reversible alterations and sense perceptible objective signs, the totality of which depicts the image of altered Vital Force constituting the disease.

Homoeopathic Materia Medica: The collective statements (in a more or less, definite anatomical order) of perceptible reactions of the healthy, human body, recorded in the words of persons acted upon by such drugs (known as provings) and also clinical observations.

Homoeopathic Medicines : Homoeopathic medicines include any substance which is recorded in the standard books on Homoeopathic Materia Medica from Hahnemann down to the present day authorities with symptoms gathered from proving on healthy human beings; or symptoms, not found during provings but observed to have been actually cured (and verified by sufficient number of observations) by the substances during their administration to sick persons; or symptoms observed either accidentally or by controlled experiments; or observed as toxicological effects on human beings or animals and which after being prepared according to the principle and technique peculiar to Homoeopathic pharmacy and are administered to a sick person according to the law of similar.

Homoeopathic Pharmacy: It is concerned with the collection, identification, preparation, standardization and preservation of drugs used in homoeopathic practice. Consistant with the individualistic and holistic philosophy of homoeopathy, homoeopathic drugs, derived from whatever source in nature are accepted and prepared from natural entity and totality without attempting to separate them into specific chemical constituents. However, specific constituents of substances are also be used as drug in Homoeopathy. As an illustration, difference in the wealth of symptoms appearing between provings with Belladonna and Atropine (which is reckoned as the main active principle of Belladonna) can be cited. Freshness of material and simplicity of manipulations (*viz*. triturations and successions as the case may be) for preserving as fully as possible the natural complex of the drug distinguish the pharmaceutical technique of homoeopathy.

History and Development of Homoeopathic Pharmacopoeia: Hahnemann combined in himself a physician, a pharmacologist and pharmacist as well. In fact, he was his own Columbus in every field of medicine. Besides being a discoverer of a new system of therapy he may justifiably be styled as the "Father of experimental Pharmacology" as he was the first to ascertain the positive effects of drugs on healthy human beings. Homoeopathy was born when Hahnemann started his revolutionary career in the field of therapeutics with the publication in 1796, of an article in Hufeland's Journal, under the title "Essay on a new principle for ascertaining the

curative powers of drugs". He started as a pharmacologist and a therapeutist and ended as a discoverer or a complete system of medicine comprising its science-portion and the art-portion, as well. The fruits of his herculean labour in the field of pharmacology or pharmacodynamics are preserved for all times in the pages of his volumes of "Materia Medica Pura" and those of "the Chronic Diseases, their peculiar nature and their homoeopathic cure". Though he left no specially systematised book on pharmacopoeia, he was not less keen on this department of medicine as it is evident from the pharmaceutical notes he incorporated with what is known as drug-provings, recorded in the above mentioned books as well as in relevant sections of Organon. These scattered materials served as a nucleus of the homoeopathic pharmacopoeia of the future.

From records it is found that the first Homoeopathic Pharmacopoeia was published by Dr. C. Caspari (Leipzig, Germany) in 1825; the first British Homoeopathic Pharmacopoeia was published in 1870 by the British Homoeopathic Society, London and which has been followed by publication of the second and third (and so far, the last) edition in 1876 and 1882 respectively. The first pharmacopoeia of the American Institute of Homoeopathy, was published for the Committee on Pharmacopoeia of the said Institute in 1897 by Otis Clap and Son, Inc. Agent Boston, U.S.A. In 1901, American Institute of Homoeopathy published second edition of the "Homoeopathic Pharmacopoeia of the United States" to give it a broader field and make it more appropriate for such a work, national in character. Since then it has run into several editions of which the current edition is the seventh, (revised) published in 1964. By the final passage (June, 1938) of the Food, Drugs and Cosmetic Act (Commonly known as the Pure Food Law), the Homoeopathic Pharmacopoeia of the United States became the sole authority in the United States, for the preparation of all remedies claiming to be homoeopathic. It is to be noted that the British Homoeopathic Pharmacopoeia is not an official pharmacopoeia of U.K.— it is by virtue of its intrinsic merit and worth, accepted by the homoeopathic profession of England and abroad and its general principles regarding standardization and preparation of drugs used in homoeopathic practice, have also been accepted by the United States Homoeopathic Pharmacopoeia as a basis because of "the care taken in the tincture making processes, the recognition of the effect of the natural plants moistures and the prescription of alcohol of different strengths for the preparation of drug tinctures and the general accuracy of the detailed description of the drug in that work (H.P.U.S. 1941)". There are also German Homoeopathic Pharmacopoeiae, especially one compiled by Von Willmar Schwabe, Leipzig, which is also considered to be an authoritative work, was first published in 1872 under the title "Pharmacopoeia Homoeopathic Polygolottica". It has run into several editions and a new Homoeopathic Pharmacopoeia is in course of preparation under the sponsorship of the West German Federal Government, a few volumes of which have been published. It is to be noted that a second English edition of the aforesaid pharmacopoeia was published in 1929. New edition of the French Homoeopathic Pharmacopoeia (Pharmacopoeia Homoeopathique Francaise); has just come out. In India the first attempt in this line was made by M. Bhattacharyya and Co. by the publication of Pharmaceutists Manual in 1893. It has run into twelve editions, the tenth one being published in 1944 which incorporated and contained about 70 of the important Indian drugs. A thoroughly revised and enlarged edition of it was published in July 1962, on behalf of M. Bhattacharyya and Co. Private Ltd., Calcutta, under the name and style of "M. Bhattacharyya & Co's Homoeopathic Pharmacopoeia".

GENERAL NOTICES

Title : The title if this books, including the supplements thereto is the HOMOEOPATHIC PHARMACOPOEIA OF INDIA, First Edition. When the abbreviation H.P.I. is used, it shall be presumed to refer to the current edition of the Homoeopathic Pharmacopoeia of India.

Names of Drugs : The main title of each drug is given in Latin or the conventional name used by the profession. The abbreviation given below the main title of each drug has the same significance as the main title.

Synonyms : Whole the main title of the drug or its abbreviation alone should be used as the descriptive name on the label or in prescribing, the alternate names in Hindi, as well as names in English, French and German under which the drug is known commonly are given for information and these names cannot be considered to have the same significance as the main title.

Initial Capital Letters in the text : Whenever the names of drug, processes or substances occur in the text of Homoeopathic Pharmacopoeia of India and are printed with capital initial letters, such substances will be deemed to be substances of the Homoeopathic Pharmacopoeia of India.

Italics : Words in the text of monograph which differ to reagents substances and process described or defined in Appendix are printed in italics. Where words printed in italics refer to reagents, substances or processes, these must conform to the requirements specified in the appropriate Appendix. Italic type is also used in the systematic names of plants, animals, micro-organisms and for some sub-headings.

Official : The word ‘official’ wherever used in the pharmacopoeia or with reference thereto is synonymous with ‘pharmacopoeia’ and applies to any statement included in the General Notices, Monographs and Appendices of the Pharmacopoeia.

Official standards : The standards of purity and strength stated in the monographs of the pharmacopoeia apply to articles which are intended to be used as Homoeopathic medicines but not necessarily to articles meant for other purposes.

All statements contained in the individual Monographs, with the exception given below, constitute standards for the official substances.

A substance is not of the pharmacopoeial quality unless it complies with all the requirements stated in the Monograph, except the molecular formula given at the beginning of the Monographs, the statements given under History and Authorities; Solubility and Habitat.

Chemical formulae : When the chemical composition of a substance is known or generally accepted, the chemical formula and molecular weight are given at the beginning of the monograph for the purpose of information. The chemical formulae and molecular weights given at the beginning of the monographs are those of the chemically pure substances and not to be regarded as an indication of the purity of the official drug.

Method of Manufacture of Chemical substances : Unless specifically described in the monograph a chemical substance may be prepared by any method provided the substance conforms to the pharmacopoeial standards.

Temperature : Unless otherwise specified, all temperature refer to the Centigrade scale. All measurements are made at 25° unless otherwise specified.

Solubility : When stating the solubilities of chemical substances the term 'soluble' is necessarily sometimes used in a general sense irrespective of the concomitant chemical change.

Statements of solubilities, which are expressed as a precise relation of weight of dissolved substance to volume of solvent, at a stated temperature, are intended to apply at the temperature. Statements of approximate solubilities, for which no figures are given, are intended to apply at ordinary room temperature.

Pharmacopoeial chemicals when dissolved may show slight physical impurities such as fragments of filter paper, fibres and dust particles unless excluded by definite tests in the individual monographs.

When the expression 'parts' is used in defining the solubility of a substance it is to be understood to mean that one gramme of a solid or one mililitre of a liquid is soluble in that number of millilitres of the solvent represented by the stated number of parts.

When the exact solubility of a pharmacopoeial substance is not known the descriptive term is used to indicate its solubility. The following table indicates the meaning of such terms :

Descriptive terms	Relative quantities of solvent for 1 part of solute
Very soluble	Less than 1 part
Freely soluble	From 1 to 10 parts
Soluble	From 10 to 30 parts
Sparingly soluble	From 30 to 100 parts
Slightly soluble	From 100 to 1000 parts
Very slightly soluble	From 1000 to 10000 parts
Practically insoluble	More than 10000 parts

Identifications : The tests described under this heading are provided only as an aid to identification. They are not in all cases sufficient to establish proof of identity. The qualitative tests by which the basic and acid radicals of ordinary salts and certain other groups of substances are recognised, are brought together in an appendix instead of being frequently repeated in the text of monograph.

Solutions : Unless otherwise specified in the individual monographs all solutions are prepared with purified water.

Odourless : The term 'Odourless' in the 'Description' would imply that its odour is discernible when a sample of not more than 25 g of the substance is examined immediately after opening the package. If any odour is discernible the sample should be rapidly transferred to an open container and re-examined after one minute. The sample shall be deemed not to comply with the description 'odourless', if the odour is still discernible.

Wt. per ml. Density, Specific gravity – The relation of weight to volume is expressed in most instances, in absolute units as weight per milliliters, this form of expression being regarded as more convenient than specific gravity.

Specific gravity is retained to distinguish the composition of mixture of alcohol and water, since alcoholic content is defined in terms of specific gravity.

Assay : The assays and tests described are the methods upon which the standards of the Pharmacopoeia depend. The analyst is not precluded from employing an alternate method in any instance if he is satisfied that the method which he uses will give the same result as the pharmacopoeial method. In suitable instances the methods of microanalysis, if of equivalent accuracy, may be substituted for the tests and assays described. In the event of doubt or dispute, the methods of analysis of the pharmacopoeia are alone authoritative.

Quantities to be weighed for Assays and Tests : In all description of Assays and Tests the quantity to be taken of the substance to be tested is indicated. The amount stated is approximate only, but the quantity actually used must be accurately weighed and must not deviate by more than ten percent, from the stated.

Constant Weight– The term 'constant weight' when it refers to prying or ignition means that two consecutive weighings do not differ by more than 1.0 mg per g of the substance taken for the determination, the second weighing following an additional hour of drying or further ignition.

Crude Drugs : Vegetable drugs are required to be free from insects and other animal matter, and from animal excreta and extraneous contaminants and to show no abnormal odour, colour, mould or other evidence of deterioration.

Reagents and solutions : The reagents required for the tests of pharmacopoeia are described in Appendices I and II showing their nature and degree of purity together with the strengths of the solutions to be made from them for purposes of tests, listing of these reagents in no way implies that they are also homoeopathic drugs. Solutions employed for volumetric determinations are described in detail in terms of a 'Normal solutions' 1 N or of a 'Molar solution' 1-M. The expression 'Test solution' has been employed in Appendix I in a few instances to avoid confusion with other solutions of different strengths which are defined in the text of the pharmacopoeia.

Weights and Measures : The metric system of weights and measures is employed.

Weights are given in terms of a gramme or a Milligramme.

Fluid measures are given in terms of millilitres. The term 'ml' is used as a short designation for the term 'millilitre'.

All measures are required to be graduated at 25 C and all measurements involved in the analytical operations of the pharmacopoeia are unless otherwise stated, to be made at that temperature.

Percentage of solutions : In defining standards, the expression 'percent' is used according to circumstances, with one of four meanings. In order that the meaning, to be attached to the expression in each instance, may be clear, the following notations are used :

Percent w/w (percentage weight in weight), expresses the number of grammes of substance in 100 grammes of product.

Percentage w/v (percentage weight in volume), expresses the number of grammes of substance in 100 grammes of product.

Percentage v/v (percentage volume in volume), expresses the number of grammes of substance in 100 grammes of product.

Percentage v/w (percentage volume in weight), expresses the number of grammes of substance in 100 grammes of product.

When the strength of a solution is expressed as parts of dissolved substance in parts of the solution, it is to be understood to mean parts by weight (grammes) of a solid in parts by volume (millilitres) of the final solution; or parts by volume (millilitres) of Liquid in parts by volume (millilitres) of the final solution; or parts by weight (grammes) of a gas in parts by weight (grammes) of the final solution.

Storage : The container and its closure must not interact physically or chemically with the substance which it holds so as to alter the strength, quality or purity of the substance; if interaction is unavoidable, the alteration must not be so great as to bring the substance below pharmacopoeial requirements.

A well closed container protects the contents from contamination by extraneous solids or moisture, from loss of the substance through efflorescence, deliquescence or evaporation under the ordinary or customary conditions of handling, shipment, storage or sale and shall be capable of tight enclosure.

Protection from light : The substance must be kept in an opaque container or in a bottle of amber, dark-red or dark-brown glass. In certain specified instances when additional protection against light is necessary, the bottle must further be covered with a black paper.

Label : In addition to the labeling and packing requirements mentioned under individual monographs, all pharmacopoeial substances must comply with the provision relating to labeling and packing as prescribed by the Rules made under the Drugs and Cosmetics Act., 1940. In respect of drugs produced by Old Hahnemannian Method the latter ‘H’ shall be added after the name of the drug preparation to differentiate them from those manufactured according to new method.

Dose : Statement regarding ‘dose’, intended for the guidance of the prescriber, has not been given in the monographs. Unlike in other systems of medicine in Homoeopathy, the average range of quantities considered suitable for administration does not arise. It is the potency indicating the qualitative measure of the medicine which has significant role. The medical practitioners will exercise their own judgment and act on their own responsibility in respect of the quantity and potency of any medicine they may prescribe or administer or the frequency of its administration.

GENERAL INSTRUCTIONS

1. Unit of Medicinal Strength : While the German Homoeopathic Pharmacopoeia still holds to Hahnemannian methods, the drug strength differs from class to class as described in Appendix XVII; the Homoeopathic Pharmacopoeia of United States has preferably adopted the uniform one tenth drug strength except in cases of few drugs. In order to obtain the uniform one tenth drug strength of tinctures, H.P.U.S. has taken the dried drug as the unit to contain one gramme of drug in ten milliliters of tincture. In the preparation of mother tinctures made from plants, the plant moisture is taken into consideration when calculating for the one tenth drug strength. While Hahnemann observed that plant moisture is a part of medicinal substance, the modern view is that the plant moisture constitutes merely as a vehicle or menstruum and forms no part of medicinal substance. As there are arguments for and against each of the method, the H.P.I. accepts new methods of the H.P.U.S. as well as the old Hahnemann methods in the preparation of tinctures.

2. Homoeopathic Medicines : The substance can be or can become a homoeopathic remedy only after the pharmacist has processed the crude products of nature in accordance with Homoeopathic technique in order to develop its inherent properties and to make its medicinal properties ready for use.

For this purpose Homoeopathic Pharmacy recognises three forms of preparation.

2.1 Solution in water, in alcohol or in mixtures of alcohol and water in varying proportions or very rarely in either glycerin or syrup.

2.2 Triturations and potencies with sugar of milk.

2.3 Potencies with alcohol.

2.4 **Various menstrual, vehicles of Solvents used in the preparation of homoeopathic remedies**

(i) Purified Water (Aqua purificata)

(ii) Alcohol

(iii) Solvent Ether

(iv) Glycerin

(v) Saccharum Lactis (Lactose)

(vi) Other vehicles as per prescription of the Physician.

For full description, methods of preparation, precautions to be observed, tests to be done, etc. please *see* respective monographs and the Appendices.

3. Drugs and Medicinal Substances : The mass of drugs used for homoeopathic practice is derived from natural divisions *e.g.* animals, plants, minerals, many synthetic chemical products, Nosodes, Sarcodes as well as physical energies, known as Imponderabilia *e.g.* Magnetism, Electricity, X-ray, Radium etc. etc. Hence all these substances and energetic are prepared as remedies by the homoeopathic pharmacist.

4. Method of procuring medicinal substances :

4.1 All vegetable and animal products are to be collected fresh, as far as possible.

4.2 Where they are the produce of foreign countries and can be only had as imported, they are to be obtained from reputed and reliable druggists, but preferably, in their natural, formal state and proper identification shall be carried out before using them.

4.3 As regards plants, the parts which are used in the preparation, are to be collected at a specific time as directed below with a few exceptions, so as to exhibit more fully their characteristic properties.

(i) Whole plant : Wherever the term 'Whole plant' is used in the text, it denotes the whole plant including the roots. When the roots are not to be used in the preparation of the mother tincture the term 'Whole Plant excluding the roots' is used. The whole plant should be gathered when it is partly in flower and partly in bud during sunny weather. They should be carefully cleaned by shaking, gently rubbing or clean specimen should be selected.

(ii) When the 'Leaves' are used, they should be collected just before or during the early part of the flowering time This rule required modification in the case of biennials, since the leaves which first appear in the spring of the second year are in this case the best and shall be collected as soon as the flowering stem begins to shoot.

(iii) When the 'Flower' is used, they should be collected partly in bud and partly in blossom and in dry weather.

(iv) When the 'Stems' are used, they should be collected after the development of leaves.

(v) When the 'Seeds and Fruits' are used, they should be collected when fully ripe.

(vi) When 'Young shoots' are used, they should be collected in the spring when the whole plant is in full vigour.

(vii) When 'Bark' of resinous trees is used it should be collected in the early spring *i.e.* at about the time of development of leaves and blossoms. Non-resinous bark should be collected late in autumn from young vigorous trees.

(viii) When 'Roots' are used, different directions are to be followed according to the nature of the plant.

(a) Roots of 'Biennials', should be collected in the spring.

(b) Roots of 'Annuals', should be dug out early in the autumn because they die after the ripening of the seeds.

(c) Roots of 'perennials' should be collected in the second and third year, before they develop woody fibre. The roots should be cleaned without the use of much water. Roots should be free from mould and woody appearance.

4.4 (i) After the fresh materials are collected, they should be processed as soon as possible, to avoid determination. If gathered at some distant from the place of manufacture, the fresh plants should be packed carefully.

(ii) General treatment of dried plants.

After their collection, they should be carefully dried by tying them in loose bundles and hanging them in the shade, protected from sun, rain etc.

4.5 Odourous substances are to be kept in separate vessels so that peculiar odour of such drugs may not be transmitted to others.

4.6 Animal substances :

These substances, *e.g.* Apis, Cantharis, Moschus etc. should be collected from healthy animal specimen. Their collection, method of preparation and preservation are described under the respective monographs of the drugs.

4.7 Minerals and Chemical Compounds :

Identity, purity and specification must comply with those laid down in the monographs.

4.8 Imponderabilia :

Energy available from physical and natural resources, *e.g.* Electricity. Magnetism, X-ray, Radium etc., are also utilised in preparing some homoeopathic drugs. For details, *see* respective monographs.

4.9 Nosodes :

Nosodes are diseased tissue products or excretions of living organism (*i.e.* Plants and animals) and bacterial and viral products.

4.10 Sarcodes :

Sarcodes are healthy tissue products or secretions or living organism *i.e.* plants and animals.

Details of their collection, preparation and preservation of nosodes and sarcodes are incorporated under respective monographs.

5. General methods of the drug preparation : Drug preparations are made either in the liquid from or in the solid form.

Substances soluble in the liquid menstrua or vehicles are made into solutions or tinctures for their subsequent potentisation and all substances which are not soluble in the liquid menstrua or vehicle are converted into solid form of preparation by the process of trituration. Soluble substances may also be made into solid preparation by trituration with sufficient care to prevent deterioration, similarly substances which are not soluble in liquid vehicle may also be converted into liquid potencies at a subsequent stage after the sixth potency in the decimal scale (6x).

5.1 **Solutions** :

(i) **Solution in Purified Water** (Aqueous Solution) : Aqueous solutions are made of substances which are soluble in water but not in alcohol or of those which, when soluble in alcohol are liable to chemical change or decomposition in it.

These are to be dissolved in different proportions as prescribed in monographs depending upon the degree of solubility of the substance. Aqueous solutions, as a rule, deteriorate and will keep well only for a short time.

No such preparation can be considered satisfactory unless the solution is perfectly free of all sediment and stays clear and transparent. If after a time, it deposits any crystals or if any of the salt effloresces around the neck of the bottle or if a fibrous-looking sediment (conferva) appears in the solution or if the solution changes colour materially, in each and all these instances the preparation should be rejected and a fresh quantity made. Since many aqueous solutions do not keep well fresh for long, the first decimal or centesimal potency should be prepared fresh.

(ii) **Solution in alcohol** (Tinctures) : They are preparations containing the soluble ingredients of the drug in alcohol.

5.2 Moisture content of a plant should be determined first * according to the method described in Appendix No. X-b,

The dry crude material after evaporation is taken as the unit of strength, the tincture being made to represent. One part of this crude material in each ten parts of completed solution. Having determined how much of dry substance is contained in a given quantity of the fresh moist material, it shall be compared with the special tincture formula for this drug. If the water-content is less than that given as the standard in the formula, the shortage is made up with addition of Purified Water. But if the water is in excess than that given as the standard in the formula either enough of water shall be deducted from alcohol to be used for preparation or if it is not possible for any reason, the fresh moist material should be subjected to a slow method of evaporation by drying in a moderate temperature to reduce the water-content and to bring it to standard formula.

6. Mother tinctures

A. *Maceration*

Apparatus :

(i) Macerating Jar with Lid,

(ii) Drug material,

(iii) Menstruum,

(iv) Chopping board and knife

Maceration process shall be used in such cases where the material requires ample time for the extraction of medicinal properties. Gummy and mucilaginous substances and those having much viscid juice which do not allow alcohol to permeate the mass readily as in the process of percolation should be macerated in the preparation of tincture.

The plant moisture shall be ascertained as described in the Appendix X and the quantity of menstruum, shall be calculated accordingly.

Reduce the drug material to a pulp (or maintain it in its natural state if not reducible) and then place it in a macerating jar (preferably make up of a stainless steel or glass). Add the pre-calculated quantity of menstrumm so as to cover the whole mass of the drug substance. Keep the Jar well corked in a cool dark place free from dust, odour, heat or direct sunlight. Agitate the whole mass once a day and keep for a period of two weeks.

* This applies to the preparation of Mother Tincture according to new methods.

Decant the supernatant liquid and press out the residue through a press or a piece of clean linen cloth.

Measure the whole fluid and if found less than the calculated quantity, add the fresh menstruum to the mass and press it again so as to make the required volume.

In case of viscid or mucilaginous material, where the alcohol does not act fully on the substance, the process can be modified as follows :

Task half the quantity of pre-calculated vehicle and add to the pulp. Keep it for three to seven days and press out the tincture thereafter.

Triturate mass which remains behind with washed sand or with green glass powder, twice the bulk of this mass and add to it the remaining half of the vehicle. Percolate the whole material as described below.

Add sufficient quantity of alcohol to the percolated volume so as to make the prescribed volume. This necessitates because of the contraction of volume where two liquids of different specific gravity are mixed.

B. *Percolation*

Apparatus :

(i) Percolator with sieve and regulating cork stopper

(ii) Glass rod with cork

This method is adopted for the extraction of dried drugs, dry vegetable substances and other organic (animal) substances. Reduce them to powder form according to one of the grades of fineness as specified in the formula of respective drug monograph.

Take a clean sterilised percolator and evenly lay the bottom with layers of powdered glass or sand, pressing it down gently with a spread, flat cork fixed on the end of a glass rod. Over this, lay the moistened pulp of the dried substance (Moistening with little menstruum) and evenly press it more firmly especially when the mass is coarse and particularly when the menstrumm is strongly alcoholic, taking care that the mass is compact and not too tight but free from fissures or empty spaces. Cover the upper surface of the mass with the disc of filter paper or a thin layer of finely powdered glass or sand.

Take sufficient quantity of the solvent so that it covers the drug substance completely. Taking care, that while pouring the solvent the arrangement of the drug substance and the powdered glass and sand is not disturbed.

Close the percolator with the lid to prevent dust from contaminating. Allow it to stand for 24 hours or longer according to the nature of the drug. Allow the fluid to percolate in the receiver drop by drop regulating the flow with the help of the stop cork. Keep a constant watch over the level of the menstruum. It should always be above the mass of the drug substance. Add fresh quantity from time to time without disturbing the arrangement within the percolator. Continue this until the requisite quantity of the menstruum has passed through the percolator and the last drop from it has been received in the receiver.

Once the last drop is received, add sufficient quantity of menstruum to cover the mass in the percolator and close the mouth of percolator with the lid to prevent further percolation. This arrangement is allowed to stand for six hours. Open the stop cork and allow the whole fluid to percolate in the receiver. Remove the mass, press it strongly to extract the remaining tincture from it. Add sufficient menstruum to make the required volume.

7. Potentisation of Drugs : In the preparation of potencies of liquid drug substances three scales are used *i.e.* (i) Decimal, (ii) Centesimal, and (iii) Fifty Millesimal.

In the preparation of potencies from solid drug substances decimal and centesimal scales are used. When the triturations attains 6x potency then only it is fit to be converted into liquid potency and subsequently treated as described on

7.1 **Decimal Scale** : The decimal scale is based on the principle that the first potency should contain one tenth part of the original drug and each succeeding potency should contain one tenth part of the potency preceding it. This method was introduced by Dr. Hering. The potency in this scale is denoted by suffixing latter 'X' to the number indicating the potency.

Take a phial preferably of ten milliliters or bigger size, perfectly clean and new, fit a good new cork into it. Mark the name of the drug with 2x on the cork. Check the name of the mother tincture to be potentised. Pour into it the exact proportion (1/10) of the mother tincture of the drug and then add the dispensing alcohol, taking care that one-third of the phial remains empty for succussion. Put the cork (marked 2x) again on the phial. Grasp the phial in the right hand or hard but elastic body or by a suitable mechanical potentiser, letting each stroke terminate in a jerk. The 2x potency on the phial. For each potency a separate new phial has to be used.

7.2 **The Centesimal Scale** : The centesimal scale is based on the principle that the first potency should contain one hundredth part of the original drug and each succeeding potency should contain one hundredth part of the potency preceding it. This method was introduced by Dr. Hahnemann. The potency in this scale is denoted by suffixing letter 'C' to the number indicating the potency. In practice it may also be denoted by simple numerical also.

Take a phial preferably of ten milliliters or bigger size, perfectly clean and new, fit a good, new cork into it. Mark the name of the drug with (1) on the cork. Check the name of the mother tincture to be potentised. Remove the cork from the phial. Pour into it the exactly proportion (1/100) of the mother tincture of the drug and then add the *dispensing alcohol*, taking care that one third of the phial remains empty for succession. Fit the cork "Marked" '1' again into the phial. Grasp the phial in the right hand with the thumb held firmly over the cork and strike it with ten powerful downwards strokes of the arm or hand but elastic body or by a suitable mechanical potentiser, letting each stroke terminate in a jerk. The first dilution is now ready. Mark the name of the drug with suffix '1' on the phial.

In making all succeeding potencies mix one part of the preceding potency to 99 parts of dispensing alcohol and shake the phial as directed above. For each potency, a separate new phial shall be used.

Now, as all the mother-tinctures, excepting a few, are prepared in such a way that the drug strength is one tenth, it is really the first decimal (1x) preparation. To prepare on centesimal scale, this 1x mother-tincture is raised to the 2x potency by adding '1' part of the mother-tincture to 9 parts of required vehicle and giving ten succussions. The 2x potency, this prepared, is really equal to the 1st centesimal potency. From now onwards the succeeding centesimal potencies are

prepared, on Hahnemannian principle, by mixing 1 part of the preceding potency to 99 parts of required vehicle.

7.3 **Fifty Millesimal Potency** : The 'Fifty Millesimal Potency' is based on the principle enunciated by Hahnemann in the Organon of Medicine — 6th Edition.

100 globules weighing sixty five mg (one grain) and such 500 globules, can hardly absorb one drop for their saturation. So the proportion of medicine to alcohol will be 1 to 50,000 (1/500 x 100). So this scale of potency goes by the name of Fifty Millesimal Potency.

Triturate the crude drug substance in the usual manner, with the sugar of milk in the proportion of 100 mg of dry substance or 0.1 mg of liquid substances with 10 g of milk sugar. Triturate the 1st potency thus prepared again in the usual manner in the proportion of 100 mg of 1st potency with 10 g of sugar of milk. Triturate the 2nd potency thus obtained in the same proportion and manner for preparing the 3rd potency.

Prepare a 'solution' of 3rd potency by adding in the proportion of 100 mg of the 3rd potency to 50 ml of a mixture of Purified Water and *dispensing alcohol* prepared by taking 4 parts of Purified Water and 1 part *dispensing alcohol*. To make the solution properly, first dissolve 100 mg of the 3rd potency in 40 ml of Purified Water and then add 10 ml of *dispensing alcohol* to it. Call it 'Mother solution'.

Mix one drop or part of this mother solution with 100 drops or part of *dispensing alcohol* and give 100 globules of which weigh 65 mg, in a drop of the preceding potency, dry them. Take one globule and dissolve it in a drop of Purified Water in new phial. Add 100 drops of *dispensing alcohol* to it and give 100 strong succussions.

8. Trituration : The object of triturations is to reduce the dry drug to the finest possible powder.

Whether a triturations is prepared manually or by a machine, the following process is adopted :

Take one part by weight of crude drug and one part by weight of Milk Sugar in coarse powder. Mix the two for a moment and then rub the mixture thoroughly for six minutes. After six minutes scrap the pestle and mortar with a spatula so that nothing adheres either to the sides of the mortar or to the pestle; stir the mixture with pestle for six minutes and stir for four minutes.

Now add 3 parts by weight of Sugar of Milk and repeat the processes of rubbing and stirring two times each as described above, *i.e.* rubbing for six minutes and stirring for four minutes.

Then add 5 parts by weight of Sugar of Milk and repeat the processes of rubbing and stirring. At the end of this process we get 1x potency of a medicine.

It will be seen that the total quantity of Milk Sugar taken is 9 parts of weight which is divided in the proportion of 1 : 3 : 5. For the next higher potency the same process is to be employed. The triturations may also be made in the centesimal scale, *i.e.*, in the proportion of 1 : 99 dividing the Sugar of Milk to 11 : 33 : 55 parts, but preparation in this scale up to 4x potency is not recommended as it may be found difficult to bring the crude drugs in the desired state of fineness. To increase the quantity of triturations without modifying other conditions is bound to result in inferior preparation and therefore, inadvisable. But as the demand for homoeopathic medicine has extensively increased all over the world and the pharmacists have to supply them

on a large commercial scale, new mechanical devices for triturating greater quantity have to be employed. It is not feasible to give strict rules for such mechanical appliances in all their interdependent details.

All insoluble substances are submitted to this process of triturations and as it is carried on as far as the third centesimal potency (or 6th decimal potency) it follows that this through rubbing and stirring is continued until the medicine constitutes only the one-millionth part of the mixture.

9. Conversion of triturations into liquid potencies : Dissolve one part by weight of the 6x triturations in fifty parts by volume of Purified Water to which fifty parts by volume of *dispensing alcohol* is added. Give ten succussions to this liquid mixture. Number 7x dilution from 6x triturations is not possible. The first potency prepared from 6x triturations is 8x (4C). Subsequent potencies may be prepared either in the decimal or centesimal scale in the usual manner but it preparing the first potency from '8x' potency use *dilute alcohol*.

10. Dispensing of Homoeopathic Medicine : Dispensing of Homoeopathic medicine is done according to the direction of the physician.

Proper precautions and cleanliness shall be observed. While dispensing in Milk Sugar, tablets of Milk Sugar or globules, medicines prepared in Purified Water or *dilute alcohol* shall not be served as they will dissolve the vehicle. When saturating globules with medicines, it is necessary to pour on the globules only sufficient quantity of medicine to saturate them. If at any time more medicine is added, it will be necessary after proper saturation of all globules to drain out the excess liquid.

11. External Application and their Components : The external preparation consists of drugs incorporated in a suitable base.

Mother Tinctures for external use : When the mother tincture is prepared according to old Hahnemannian Method, the mother tincture of the drug to be used in the preparation of external application shall satisfy the following specification.

Tincture prepared according to formula for class one and two.	If no special direction for the preparation is given, 1 part by weight of mother tincture and 1.5 parts by weight of ethyl alcohol (45%) are to be mixed.
Tincture prepared according to formula for class three.	If no special direction for the preparation is given, 1.5 parts by weight of mother tincture and 1 part by weight of ethyl alcohol (60%) are to be mixed.
Tincture prepared according to formula for class four.	If no special direction for the preparation is given, 1 part by weight of mother tincture and 1 part by weight of ethyl alcohol which was used for preparation of the tinctures are to be mixed.

All Mother Tinctures unless otherwise specified are to be diluted with equal parts of alcohol of the same strength used for the preparation of the Mother-tinctures.

12. The following are some of the bases used for preparation of Ointments, Liniments, Glycerols, Cerates, Lotions, Opodeldoes, formulations for internal use (urethral, rectal etc.), Plasters, Poultices and Oils etc.

1. Olive Oil
2. Glycerin
3. Almond Oil
4. Paraffin soft (Petrolatum)
5. White Wax
6. Spermaciti
7. Sesame Oil
8. Rosemary Oil
9. Prepared Lard
10. Curd Soap
11. Hard Soap
12. Soft Soap
13. Starch
14. Lanolin
15. Bees Wax
16. Simple Ointment
17. Coconut Oil

For details information refer to the Appendix XIV.

13. External Applications : These consists of Glyceroles, Liniments, Ointments, Cerates, Lotions, prepared for vaginal, nasal, ophthalmic, ear, skin applications, Plasters, Poultices and Oils etc. etc.

13.1 **Glyceroles** : These are readily made by adding the mother tincture of a drug or a crude drug of Glycering in various proportions.

In preparing glyceroles of a pure substance, finely triturate it in a mortar before mixing with Glycering.

The glyceroles are very convenient preparations and being soluble in all proportions in water and alcohol and can be diluted to make liniments, lotions etc.

All glyceroles (except of starch) are prepared by mixing one part of the required drug with four parts of glycerin.

(i) **Glycerole of Starch** is prepared as follows :

Take one part of starch and mix it with eight parts of glycerin, rub together till intimately mixed, transfer the mixture to porcelain dish, apply heat gradually raising to 116° and stir constantly till the starch-particles are completely broken and a jelly-like preparation is made.

13.3 **Liniments** : Liniments and embrocations are suitable for application, rubbing, anointing or painting. These are generally ioly or soapy, prepared by mixing one part of the required drug with four parts of olive oil or tincture of soap.

In making tincture of soap, take

Soft Soap	10 g
Alcohol Fortis	25 ml
Purified Water	16 ml

Dissolve with gentle heat and strain.

13.3 **Ointments** : Ointments are prepared by two general methods :-

(1) Mechanical incorporation and (2) Fusion. Mechanical incorporation is performed by triturations in a mortar or on a glass slab with a spatula. The medicament used in the ointment shall be reduced to an impalpable fine powder. Preparation by fusion : When wax, spermaceti resin or other hard fusible bodies are to be incorporated with soft, oleaginous materials, they are melted on a water-bath to avoid excessive temperatures beginning with the material which has the highest fusion point and adding the other ingredients in order of decreasing values.

Medicated ointments are usually prepared by mixing the mother tincture of the required drug with any suitable base.

13.4 **Cerates** : Cerates are unctuous substances which owe their name to the presence of wax (cera). They are of such consistency that they may be easily spread, at ordinary temperature, upon gauge or similar material with a spatula and yet not be so soft as to liquefy and run when applied to the skin. They are mostly used as dressings for inflamed surfaces and are generally made with oil, lard or petrolatum as basis with sufficient bees wax to give the desired consistency.

13.5 **Lotions** : Lotions are liquid suspensions or dispersions intended for external application over the body.

They are prepared either by simply diluting the medicine with purified water in a suitable proportion or by adding one part glycerol or the intended medicine in purified water in suitable proportion.

To prepare evaporating lotions, add medicine to dilute alcohol in required proportion.

13.6 **Opodeldocs** : These are semi-solid liniments prepared by mixing

White Curd Soap	140 g
Purified Water	266 ml
Alcohol	444 ml
Mother tincture of the drug	100 ml

Method : Dissolve soap in purified water with a gentle heat until it becomes transparent, add gradually alcohol of the same strength as used for the preparation of mother tincture and then add mother tincture of the drug. Stir well and strain (while fluid) and pour into suitable container.

13.7 **Plasters** : Plasters are substances intended for external application, made of such material and of such consistency as to adhere to the skin and thereby attach a dressing.

Method : Take 30 g of *isinglass* in shreds and dissolve it first by digesting and then by boiling a sufficient quantity of purified water. Filter through clean towel moistened with purified water, evaporate the solution on a water-bath until it is reduced to 300 g. Spread about half of this evenly on a piece of linen or muslin, silk etc., now add the desired mother tincture, to the remaining half and mix, with this complete the spreading. Arnica and Calendula Plasters are generally used and prepared according to the above mentioned method.

13.8 **Poultices** (Cataplasms) : Poultices are soft, semi-liquid, external applications which either stimulate the body surface or alleviate an inflamed area by applying medicated substances in the presence of heat and moisture. For many centuries they have been made from hot water and linseed meal or other cohesive material which maintain intimate contact with skin at the same time remaining hot and moist, for fairly long period.

13.9 **Oils** : Some oils such as olive oil, almond oil or til oil are used as base in which the medicinal substance is steeped for some time.

ABBREVIATIONS OF TECHNICAL TERMS

The abbreviations commonly employed are as follows :

mm	Millimetre
cm	Centimetre
µ	Micron (0.001 mm)
mµ	Millimicron
Kg	Kilogramme
gr	Grain
g	Gramme
mg	Milligramme
mcg	Microgramme
ml	Millilitre
Wt. per ml.	Weight per millilitre
Sp. Gr.	Specific gravity
I.P.	Indian Pharmacopoeia, 2nd Edition 1966
H.P.I.	Homoeopathic Pharmacopoeia of India
ϕ	Mother tincture
0/1	Mother solution of 50 Millesimal potency
C	Centesimal potency
X	Decimal potency
At. Wt.	Atomic weight
Mol. wt.	Molecular weight
M	Molarity
N	Normality
H.P.U.S.	Homoeopathic Pharmacopoeia of the United States
T.S.	Transverse Section
Bot.	Botanical

List of Monographs for H.P.I. Volume – I with Abbreviations

S. No.	Name of the Monograph	Abbreviation
1.	Abroma Augusta	Abrom. ag.
2.	Abrotanum	Abrot.
3.	Acalypha Indica	Acal. ind.
4.	Acidum Aceticum	Ac. acet.
5.	Acidum Muriaticum	Ac. mur.
6.	Acidum Nitricum	Ac. nit.
7.	Acidum Phosphoricum	Ac. phos.
8.	Acidum Sulphuricum	Ac. sul.
9.	Aconitum Napellus	Acon. np.
10.	Aesculus Hippocastanum	Aesc. hip.
11.	Aethusa Cynapium	Aeth. cy.
12.	Agaricus Muscarius	Agar. m.
13.	Agnus Castus	Agn. cast.
14.	Alcohol Fortis—Strong Alcohol	Alc.
15.	Allium Cepa	All. cepa.
16.	Allium Sativum	All. sat.
17.	Aloe Socotrina	Alo. soc.
18.	Alumina	Alumin.
19.	Ambra Grisea	Ambr. gr.
20.	Ammonium Carbonicum	Am. carb.
21.	Ammonium Causticum	Am. caust.
22.	Ammonium Muriaticum	Am. mur.
23.	Amyl Nitrosum	Am. nit.
24.	Anacardium Orientale	Anac. or.
25.	Andrographis Paniculata	Andro. pan.
26.	Antimonium Arsenicicum	Ant. ars.
27.	Antimonium Crudum	Ant. cr.
28.	Antimonium Tartaricum	Ant. tart
29.	Apis Mellifica	Apis. mel.
30.	Apocynum Cannabinum	Apoc. can.
31.	Aralia Racemosa	Aral. rac.
32.	Argentum Metallicum	Arg. met.
33.	Argentum Nitricum	Arg. nit.
34.	Arnica Montana	Arn. mont.
35.	Arsenicum Album	Ars. alb.
36.	Arsenicum Iodatum	Ars. iod.
37.	Arsenicum Sulphuratum Flavum	Ars. s. f.
38.	Arsenicum Sulphuratum Rubrum	Ars. s. r.
39.	Artemisia Vulgaris	Art. vul.
40.	Arum Triphyllum	Arum. tri.
41.	Asafoetida	Asaf.
42.	Aurum Metallicum	Aur. met.

S. No.	Name of the Monograph	Abbreviation
43.	Aurum Muriaticum	Aur. mur.
44.	Avena Sativa	Aven. sat.
45.	Azadirachta Indica	Azad. ind.
46.	Baptisia Tinctoria	Bapt.
47.	Baryta Carbonica	Bar. carb.
48.	Baryta Muriatica	Bar. mur.
49.	Belladonna	Bell.
50.	Bellis Perennis	Bel. per.
51.	Berberis Vulgaris	Berb. vul.
52.	Blatta Orientalis	Blat.
53.	Boerhaavia Diffusa	Boer. dif.
54.	Borax	Borax
55.	Bovista	Bovist.
56.	Bryonia Alba	Bry. alba.
57.	Bufo Rana	Bufo. ran.
58.	Cactus Grandiflorus	Cact. grn.
59.	Calcarea Arsenicosa	Cal. ars.
60.	Calcarea Carbonica	Cal. carb.
61.	Calcarea Fluorica	Cal. fl.
62.	Calcarea Phosphorica	Cal. phos.
63.	Calcarea Sulphurica	Cal. sul.
64.	Calendula Officinalis	Calend.
65.	Calotropis Gignatia	Calot. gig.
66.	Camphora	Camph.
67.	Cannabis Indica	Can. ind.
68.	Cannabis Sativa	Can. sat.
69.	Cantharis	Canthr.
70.	Carbo Animalis	Carbo. an.
71.	Carbo Vegetabilis	Carbo. veg.
72.	Carduus Marianus	Card. mar.
73.	Caulophyllum Thalictroides	Caulph.
74.	Causticum	Caust.
75.	Ceanothus Americanus	Ceano. am.
76.	Chamomilla	Cham.
77.	Chelidonium Majus	Chel. maj.
78.	Chininum Arsenicosum	Chin. ars.
79.	Chininum Sulphuricum	Chin. sul.
80.	Cicuta Virosa	Cic. vir.
81.	Cimicifuga Racemosa	Cim. rac.
82.	Cina	Cina
83.	Cinchona Officinalis	Cinc. of.
84.	Cocculus Indicus	Coc. ind.
85.	Coffea Cruda	Coff. cr.
86.	Colchicum Autumnale	Colch. at.

S. No.	Name of the Monograph	Abbreviation
87.	Colocynthis	Coloc.
88.	Conium Maculatum	Con. mac.
89.	Crataegus Oxyacantha	Crat. oxy.
90.	Croton Tiglium	Crot. tig.
91.	Cuprum Arsenicosum	Cup. ars.
92.	Cuprum Metallicum	Cup. met.
93.	Digitalis Purpurea	Dig. pur.
94.	Dioscorea Villosa	Dios. vil.
95.	Drosera Rotundifolia	Dros. rot.
96.	Dulcamara	Dulc.
97.	Echinacea Angustifolia	Echin. an.
98.	Eupatorium Perfoliatum	Eup. perf.
99.	Euphrasia Officinalis	Euph. of.
100.	Ferrum Metallicum	Fer. met.
101.	Ferrum Phosphoricum	Fer. phos.
102.	Ficus Religiosa	Ficus rl.
103.	Gelsemium Sempervirens	Gels.
104.	Geranium Maculatum	Gern. mac.
105.	Graphites	Graph.
106.	Gymnema Sylvestre	Gymn. syl.
107.	Hamamelis Virginica	Ham. virg.
108.	Helleborus Niger	Hell. nig.
109.	Hepar Sulphur	Hep. sul.
110.	Holarrhena Antidysenterica	Hol. andy.
111.	Hydrastis Canadensis	Hydr. can.
112.	Hydrocotyle Asiatica	Hydro. as.
113.	Hyoscyamus Niger	Hyos. nig.
114.	Hypericum Perforatum	Hyper.
115.	Ignatia Amara	Ign.
116.	Iodium	Iod.
117.	Ipecacuanha	Ipecac.
118.	Janosia Ashoka	J. ashok.
119.	Justicia Adhatoda	Just. ad.
120.	Kali Bichromicum	Kali. Bich.
121.	Kali Carbonicum	Kali. carb.
122.	Kali Iodatum	Kali. iod
123.	Kali Muriaticum	Kali mur.
124.	Kali Phosphoricum	Kali. phos.
125.	Kali Sulphuricum	Kali. sul.
126.	Kreosotum	Kreos.
127.	Lachesis	Lach.
128.	Ledum Palustre	Led. pal.
129.	Lycopodium Clavatum	Lyco.
130.	Magnesia Carbonica	Mag. carb.

S. No.	Name of the Monograph	Abbreviation
131.	Magnesia Muriatica	Mag. mur.
132.	Mercurius Corrosivus	Merc. cor.
133.	Mercurius Dulcis	Merc. dul.
134.	Mercurius Iodatus Flavus	Merc. i. f.
135.	Mercurius Iodatus Ruber	Merc. i. r.
136.	Mercurius Solubilis	Merc. sol.
137.	Mezereum	Mez.
138.	Myrica Cerifera	Myri. cer.
139.	Natrum Carbonicum	Nat. carb.
140.	Natrum Muriaticum	Nat. mur.
141.	Natrum Phosphoricum	Nat. phos.
142.	Natrum Sulphuricum	Nat. sul.
143.	Nux Moschata	Nux. mos.
144.	Nux Vomica	Nux. vom.
145.	Ocimum Sanctum	Oci. sant.
146.	Opium	Opium
147.	Petroleum	Petrol.
148.	Phosphorus	Phosph.
149.	Phytolacca	Phyto.
150.	Platinum Metallicum	Plat. met.
151.	Plumbum Metallicum	Pb. met.
152.	Podophyllum Peltatum	Podo.
153.	Psoralea Corylifolia	Psorl. cor.
154.	Pulsatilla Nigricans	Puls.
155.	Purified Water	—
156.	Rauvolfia Serpentina	Rau. serp.
157.	Rhus Toxicodendron	Rhus. tox.
158.	Ruta Graveolens	Ruta.
159.	Sabadilla	Sabad.
160.	Sabina	Sabin.
161.	Saccharum Lactis	Sac. lac.
162.	Sanguinaria Canadensis	Sang. ca.
163.	Secale Cornutum	Sec. cor.
164.	Selenium	Selen.
165.	Senega	Seneg.
166.	Sepia	Sepia
167.	Silicea	Sil.
168.	Spongia Tosta	Spong. to.
169.	Stannum Metallicum	Stan. met.
170.	Staphysagria	Staph.
171.	Sulphur	Sulph.
172.	Sulphur Iodatum	Sul. iod.
173.	Syzygium Jambolanum	Syz. jam.
174.	Tabacum	Tabac.

S. No.	Name of the Monograph	Abbreviation
175.	Terminalia Arjuna	Term. arj.
176.	Thuja Occidentalis	Thuja.
177.	Tribulus Terrestris	Trib. ter.
178.	Veratrum Viride	Vert. vir.
179.	Withania Somnifera	With. som.
180.	Zincum Metallicum	Zinc. met.

Revised Monograph Appeared in HPI Vol. IX

ABROMA AUGUSTA
(Abrom. ag.)

Botanical name : *Abroma augusta* Linn. f. **Family**: Sterculiaceae

Common name : *Hindi*: Olat Kambal.

Description : A large shrub or a small tree with downing branches. Leaves 8 to 15 cm long, narrowed to 3 to 7 nerved base, repand, denticulate, glabrous above, tomentose below; stipulate, linear, deciduous, as long as petiole. Peduncles 4 cm auxillary flowers 5 cm across. Calyx-lobes lanceolate, free nearly to the base. Petals slightly exceeding the sepals imbricate in bud, deciduous. Capsule 4 to 5 cm in diameter, thrice as long as the persistant calyx, glabrous or nearly so when ripe.

Microscopical : Leaf, prominently stellate hairs, which are often simple unicellular, uniseriate, glandular and peltate types. The vascular bundles in the petiole are closely placed but separate. The leaf is dorsiventral. Crystals are quite frequent in large clusters and found in mesophyll, mid rib and in petiole. Palisade and spongy parenchyma clearly differentiated; the palisade being one layered. Stomata are on the lower side and are of ranunculaceous type. The mucilaginous receptacles are present, which in the form of cell cavities and canals.

Habitat : It occurs wild or cultivated throughout India from Uttar Pradesh to Sikkim, Khasia Hills, Assam, Bengal and Bihar.

History and authority : Mentioned in the drugs of Hindoostan, V. edition Dr. D. N. Ray of Calcutta made a short proving.

Part used : Leaves.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Abroma Augusta, moist magma containing Solids 100 g and Plant Moisture 400 ml	500 g
Purified Water	159 ml
Strong Alcohol	478 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *dilute alcohol.* 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IX

ABROTANUM
(Abrot.)

Botanical name : *Artemisia abrotanum* (Tourn) Neck

Family: Compositae (Asteraceae)

Common names : *English*: Southernwood, lady's love; *French*: Auroma de-sjerdins; *German*: Eberrante

Description : An evergreen, under shrub with upright stem, 1 to 1.5 meter high; leaves are greyish-green, alternate, lower bipinnate, upper pinnate, capillary; covered with minute white pubescence. Flowers are yellow, appearing from August to October, fertile; the heads nodding in wand-like panicles. The involucres whitish; downy hemispherical, the corolla naked. It contains a crystallisable alkaloid abrotine.

Habitat : Great Britain; Europe-particularly Southern Europe. Cultivated for its fragrant foliage.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 558; Cyclop. Drug. Path. Vol. I.

Part used : Leaves and young shoots.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Abrotanum in moderately *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	794 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and *dilute alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III,

Revised Monograph Appeared in HPI Vol. VIII

ACALYPHA INDICA

(Acal. ind.)

Botanical name : *Acalypha indica* Linn. **Family**: Euphorbiaceae

Synonyms : *Acalypha spicata* Forsk, *Acalypha cilliata* Wall, *Acalypha canescen* Wall.

Common names : *Hindi*: Khokali; *English*: Indian nettle.

Description : An annual Indian weed, growing 30 to 90 cm in height; leaves 4 to 8 cm in length, ovate, petiole gradually narrowing, dentate margin, having smooth hairs and light green in colour; flowers and fruits small, finely indented. The root vertical, woody somewhat tortous and of a pale buff colour. Its flowers and bears fruit throughout the year. It contains alkaloid, acalyphine, resin, tannin and volatile oil. It also contains a cyanogenetic glycoside.

Microscopical : Leaf: a transverse section shows, a layer of upper epidermal cells next to which there one layer of palisade cells. The spongy parenchyma consists of 4 to 6 layers of loosely arranged parenchymatous cells beneath which there is lower epidermis. The hairs are present especially on the veins, mid ribs and petioles on the under surface and they are mostly unicellular with spiny projections on the walls. The mid rib region shows, a prominent ventral bulge composed of thick-walled collenchymatous cells. The vascular bundle lies in the centre and shows a compact crescent shaped mass.

Stem: Hairs present. Epidermis consists of isodiametric cells. Cortex of 6 to 8 layers with collenchymatous patches altering with parenchymatous tissue, containing some dark cell contents. Laticiferous cells and laticiferous vessels are present in cortex and pith. Rosette crystals are present in the pith especially.

Root: Transverse section characterised by the presence of deep pale buff coloured wood and comparatively small cortex including cork. Many cortical cells contain starch and rosette crystals of calcium oxalate. The bulk wood mainly made up of tracheids, vessels and wood fibres. Medullary rays are composed of 1 to 2 rows of cells, containing starch. Fibres with irregular margins and broad or tapering ends. Tracheids have both pitted and scalariform thickening on their walls.

Habitat : Throughout the plains of India. It is a common weed in gardens and waste places.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 3. Drugs of Hindoostan, S. C. Ghose. Hering's Guid. Symp. Vol. I, 34.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Acalypha Indica, moist magma containing solids 100 g and plant moisture 300 ml	400 g
Purified Water	100 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x with *dilute alcohol.* 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VIII & IX

ACIDUM ACETICUM

(Ac. acet.)

Chemical symbol : CH_3COOH **Mol. Wt.**: 60.053

Common names : Acidum aceticum glaciale, Aceti acidum, Glacial acetic acid; *French*: Acide acetique; *German*: Essigsaure.

Description : A clear, colourless liquid having a very strong odour of vinegar and a sharp acid reaction. It is miscible with water and alcohol in all proportions. It is prepared from alcohol or by synthesis. Its specific gravity is 1.0471. It boils at about 118° and congeals at a temperature not lower than 15.6°. Contains not less than 99.4 percent of $C_2H_4O_2$.

Identification : (i) when warmed with *dilute sulphuric acid* and alcohol, the characteristic odour of ethyl acetate is evolved.

(ii) When neutralised, responds to the *reactions* characteristic of acetates.

Arsenic : Not more than 2 parts per million,

Chlorides : 5 ml complies with the *limit test for chlorides*,

Heavy metals : Evaporate 5 ml to dryness in a porcelain dish on a water-bath, warm the residue with 2 ml of 0.1 N *hydrochloric acid* and add *water* to make 25 ml, the *limit of heavy metal* is 10 parts per million.

Non-volatile matter : Leaves not more than 0.01 percent w/w of residue, when evaporated to dryness and dried to constant weight at 105°.

Assay : Weigh accurately about 5.0 g into a stoppered flask containing 50 ml of *water* and titrate with 1 N *sodium hydroxide*, using solution of phenolphthalein as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.06005 g of $C_2H_4O_2$.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 4. Hering's Guid. Symp. Vol. I.

Preparation : (a) Mother Solution — Drug Strength 1/10

(I) Acidum Aceticum — 104.7 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x with Purified Water to be freshly made for immediate use only, 4x and 5x with *dilute alcohol.* 6x and higher with *Dispensing Alcohol.*

(II) Trituration 1x	Drug Strength 1/10
Acidum Aceticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

During the process of trituration care should be taken to ensure that the temperature does not rise above 12°.

(b) Potency: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

ACIDUM MURIATICUM
(Ac. mur.)

Chemical symbol : HCl **Mol. wt.**: 36.461

Common names : Acidum hydrochloricum, Acid muriatic, Hydrocholoric acid; *French*: Acide chlorhydrique, s. muriatique; *German*: Chlorwasserstoffsaure.

Description : A colourless fuming liquid, odour pungent and a very acid taste. Its fumes and odour disappears when it is diluted with 2 volumes of *water*. It is soluble in water and alcohol, producing strong acid solutions. When distilled, it yields a constant boiling mixture containing approximately 20.2 percent w/w of hydrogen chloride. Boiling at about 110° and has a specific gravity of 1.16. It is commonly prepared by the interaction of sodium chloride and sulphuric acid or by combining chlorine and hydrogen. Contains not less than 35.0 percent w/w and not more than 38.0 percent w/w of HCl.

Identification : (i) when neutralised, it responds to all the *reactions* characteristic of *chlorides*.

(ii) When added of *potassium permanganate*, *chlorine* is evolved.

Arsenic : Not more than 1 part per million,

Lead : Not more than 5 parts per million,.

Residue on ignition : Leaves on evaporation and gentle ignition, not more than 0.01 percent w/w of residue.

Assay : Weigh accurately about 4 g into a stoppered flask containing 40 ml of *water* and titrate with 1 N *sodium hydroxide*, using solution of methyl orange as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.03646 g of HCl.

Storage : Preserved Hydrochloric Acid in well-closed container.

History and authority : The first proving were made under Hahnemann's directions. Allen's Encyclop. Mat. Med. Vol. VI, 415.

Preparation : (a) Mother Solution Drug strength 1/10

Acidum Muriaticum 322 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x to be prepared with Purified Water. 4x and higher with *Dispensing Alcohol*.

Old method : Class V a,

Revised Monograph Appeared in HPI Vol. VIII

ACIDUM NITRICUM
(Ac. nit.)

Chemical symbol : HNO_3 **Mol. Wt.**: 63.013

Common names : Acidum nitri, aquafortis, Hydrogen nitrate, Nitric acid; *French*: Acide azotique s. nitrique; *German*: Salpetersaure.

Description : A fuming liquid, very caustic, has a characteristic and highly irritating odour. It is miscible with water and dilute alcohol in all proportions. Its specific gravity is 1.41. It boils at 120°. It is prepared by oxidation of ammonia with air in the presence of platinum as catalyst. It attacks most metals evolving brown fumes. Contains not less than 69 percent and not more than 71 percent w/w of HNO_3.

Identification : (i) It is strongly acidic even when freely diluted with *water*.

(ii)When neutralised, responds to the *reactions* characteristic of nitrates.

Arsenic : Not more than 5 parts per million,

Copper & Zinc : Dilute 1 ml with 20 ml of water and add a slight excess of dilute solution of *ammonia*; a blue colour is produced. Into this mixture pass *hydrogen sulphide*, a precipitate is not produced.

Chloride : 5 ml neutralised with *dilute ammonia* solution complies with the *limit* test for chloride,

Lead : Not more than 2 parts per million, I**on** : 0.5 ml complies with the *limit test for iron*,

Sulphate : To 2.5 ml, add 10 mg of *sodium bicarbonate* and evaporate to dryness on a water-bath; the residue dissolved in *water*, complies with the *limit test for sulphates*,.

Non-volatile matter : Not more than 0.01 percent w/w.

Assay : Weigh accurately about 4 g into a stoppered flask, containing 40 ml of *water* and titrate with 1 N *sodium hydroxide* using solution of methyl orange as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.06302 g of HNO_3.

History and authority : The first proving were made under Hahnemann's directions. Allen's Encyclop. Mat. Med. Vol. VII, 10.

Preparation : (a) Mother Solution Drug Strength 1/10

Acidum Nitricum 141 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x with Purified Water, to be freshly made for immediate use only. 4x and 5x with *dilute alcohol*. 6x and above with *Dispensing Alcohol.*

Storage : The preparations of this acid upto 3x potency are to be stored in well closed containers with glass stopper.

Old method : Class Va

ACIDUM PHOSPHORICUM

(Ac. phos.)

Chemical symbol : H_3PO_4 **Mol. wt.**: 97.995

Common names : Orthophosphoric acid, Acidum ossium; *French*: Acide Phosphorique; *German*: Phosphorsaure.

Description : A colourless, odourless liquid of a syrupy consistency. At 200º, the acid gradually changes to pyrophosphoric acid and at higher temperature it passes into metaphosphoric acid. It is miscible with water or alcohol, with the evolution of heat. Its specific gravity is 1.71. It may be obtained by the oxidation of phosphorus in contact with water. Contains not less than 88 percent and not more than 90.0 percent w/w of H_3PO_4.

Identification : (i) It is strongly acidic even when freely diluted with *water*.

(ii) When carefully neutralised with *potassium hydroxide* test solution and a solution of *silver nitrate* added, a characteristic yellow precipitate, soluble in *ammonium hydroxide* is formed.

Arsenic : Not more than 5 parts per million

Aluminium and Calcium : 1 ml diluted with 10 ml of *water* gives no precipitate when made alkaline with *dilute solution of ammonia*.

Lead : Not more than 10 parts per million

Iron, Chloride and Sulphate : Complies with the *limit tests for Iron, chlorides* and *sulphates*

Phosphorus and Hypo-phosphoric acid : 0.05 ml diluted with 10 ml of *water* and it does not become brown on warming with a *solution of silver nitrate.*

Assay : Mix about 1.5 g accurately weighed with a solution of 10 g of *sodium chloride* in 30 ml of water and titrate with 1 N *sodium hydroxide*, using solution of *phenolphthalein* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.04900 g of H_3PO_4.

History and authority : The drug was first proved and Hahnemann's directions. Allen's Encyclop. Mat. Med. Vol. VII, 346.

Preparation : (a) Mother Solution — Drug strength 1/10 w/v

Acidum Phosphoricum — 118 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x with Purified Water to be freshly made for their immediate use only; 4x and 5x with *dilute alcohol*. 6x and above will be prepared in *Dispensing Alcohol.*

Old method : Class VB

ACIDUM SULPHURICUM

(Ac. sul.)

Chemical symbol : H_2SO_4 **Mol. wt.**: 98.078

Common names : Acidum sulphuricum, Sulphuric acid, Oil of virtriol; *French*: Acide sulfurique; *German*: Schwefelsaure.

Description : A colourless heavy caustic and corrosive liquid of oily consistency; odourless, a very sharp and acid taste. It is miscible with *water* and *alcohol* with the evolution of much heat. Its specific gravity is 1.84. It freezes to a colourless crystalline mass, melting at 10.5°. It is obtained by the oxidation of *sulphur* or *sulphur dioxide* in the presence of *water*. Contains not less than 95 percent w/w of H_2SO_4.

Identification : When neutralised, it responds to all the *reactions* characteristic of sulphates.

Arsenic : Not more than 3 parts per million

Chloride : 5 ml dilute with *water* and neutralised with dilute *ammonia* solution complies with the *limit* test for *chlorides*

Lead : Not more than 20 parts per million

Ash : Not more than 0.01 percent

Assay : Weigh accurately about 2 g and mix with about 40 ml of water and titrate with 1 N *sodium hydroxide*, using solution of *methyl red* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.04904 g of H_2SO_4.

History and authority : This was first proved by Hahnemann. Allen's Encyclop. Mat. Med. Vol. IX, 417.

Preparation : (a) Mother Solution — Drug strength 1/10

Acidum Sulphuricum	183.5 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x to be prepared in Purified Water. 4x and higher with *Dispensing Alcohol*.

Storage : Potencies prepared in Purified Water should be freshly prepared and all preparation of this acid should be kept in ground stoppered vials.

Old method : Class V a

ACONITUM NAPELLUS
(Acon. np.)

Botanical name : *Aconitum napellus* Linn. **Family**: Ranunculaceae

Synonyms : *Aconitum angustifolium* Bernh ex Reichb, *A. Coeruleum* Blocki, *A. disectum* D. Don, *A. multifidum* Royle, *A. stoerckianum* Reichb, *A. tauricum* Wul, *A. vulgare* DC.

Common names : *Hindi*: Mitha zaher; *English*: Helmet flower; *French*: Aconit; *German*: Eisenhut, Sturmhat.

Description : A perennial herb, having perpendicular, tapering tuberous roots. The stem is upright, round, smooth, slightly hairy above and grows upto the height of 2 meter. The leaves are alternate long stalked, hairy on the under surface. They are palmately lobed, the lower more deeply than the upper into three or five segments, which are again divided. The flowers are of dark-violet colour and appear from May to July. They are stalked and racemose. Petaloid sepals five, the upper helmet shaped and beaked, nearly hemispherical, the two laterals are roundish and hairy internally; the lower two are oblong oval.

Macroscopical : The roots are tuberous and are either single or in clusters of two or more, the younger smoother root or roots being connected with the older deeply wrinkled roots by means of side branch or branches. Each root is obconical, usually from 4 to10 cm and 1 to 3.5 cm wide at the crown to which is attached the base of an aerial stem or the remains of the bud with numerous thin, wiry rootlets, the scars left by these. Old roots are brown and the young roots are yellowish-white internally. The external surface is dark brown. Fracture short, horny or mealy.

Microscopical : Near the tip of the root, cross section show diarch radial bundles, gradually upwards these become successively tetrarch, pentarch and occasionally octarch. The root cortex consists of narrow region bounded externally by a metaderm of about 1 to 4 layers of brownish cells. Cortical cells are pitted cellulosic parenchyma. The endodermis consists of brownish, longitudinally elongated rectangular cells, enclosing a pericycle of about 1 to 20 layers of parenchyma cells. Sclereids are occasionally present in cortex and pericycle. Five to eight bundles of primary phloem alternating with the angles of cambium lies within the pericycle. The metaphloem is a broad band of parenchyma cells, densely packed with starch grains, both simple and compound, 2 - 6 to 15 - 20 µ in diameter. Numerous islets of sieve tissues are embedded in this region; cambium in the upper part of the root, stellate in transverse section, consists of rectangular prismatic cells, enclosing at each angle, a wedge shaped group of parenchymatous medullary ray cells on the inner margin of which is a small primary xylem, containing spiral

vessels, the wedge flanked on either side by a small group of secondary xylem, consisting mainly of reticulate and pitted vessels; additional groups of secondary xylem are distributed along the cambium. The medullary rays are indistinct and the pith consists of cellulosic parenchyma.

Habitat : It is found in wet, shady places in mountainous regions at the high altitudes. It is found in Western Himalayas, in central, Southern Europe and Siberia. It is also found in mountainous ranges of Pacific coast of America.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 12. Hering's Guid. Symp. Vol. I, 28.

Part used : The whole plant. Moisture contents of fresh plant 350 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aconite Napellus in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	683 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I and II

Revised Monograph Appeared in HPI Vol. X

AESCULUS HIPPOCASTANUM
(Aesc. hip.)

Botanical name : *Aesculus hippocastanum* Linn. **Family**: Sapindaceae

Common names : *Hindi*: Pu; *English*: Horse chestnut; *French*: Marronier d'Inde; *German*: Gemeine Kastaive.

Description : It is a large ornamental tree, 12 to 18 meter high, with many branches. Bark smooth, white, not very firm wood. Leaves opposite, digitate, bright green; leaflets serrate, straight veined. Flowers appear in June on a terminal inflorescence, consisting of a panicle, with the lower branches shorter than the middle ones, often polygamous, the greater portion with imperfect flowers. Pedicels jointed, corolla spreading, white spotted with purple and yellow of five petals. Stamens declined. The fruit a nut, large, ovoid, mahogany coloured, perfectly smooth and shining with a large oval hilum, which is pale in colour and rough.

Habitat : It is native of middle Asia but flourishes well in temperate climate. It was introduced into Europe in 1576. It is now extensively cultivated as an ornamental tree in both Europe and America. It is extensively grown in India.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 48. Hering Guid. Symp. Vol. I, 74.

Part used : The ripe nut excluding the outer shell. The fresh nut's moisture content, 120 ml per 100 gm of solid.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Aesculus Hippocastanum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three part Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

(c) Trituration: 1x and higher to be triturated in accordance with the method6x may be converted to liquid 8x9x and higher with *Dispensing Alcohol*.

Old method : Class III

Revised Monograph Appeared in HPI Vol. VIII

AETHUSA CYNAPIUM

(Aeth. cy.)

Botanical name : *Aethusa cynapium* Linn. **Family**: Umbelliferae (Apiaceae)

Common names : *English*: Fool's parsely, Dog poison, Garden Hemlock; *French*: Ciguedes Jardins; *German*: Garten schierling.

Description : An annual, poisonous herb, growing upto 60 cm in height, strongly resembling parsley in appearances, yet easily distinguished from it, by its nauseous smell, when rubbed and its loathsome taste. Root spindle shaped, stem erect and quite smooth, hollow and sometimes violet striped, often branched in a zigzag; leaves shining, dark green in colour, but light coloured on the under surface and twice or thrice pinnatified; the umbels are without involucres and with three leaved pendulous involucres, which distinguishes this plant from the garden parsley. Flowers are small on slender pedicles, the outer ones slightly radiant. Calyx teeth absent. Petals obcordate, with a deep notch and a short incurred tongue, white, disk board, flat, styles short reflexed; fruit small, about 33 mm or little more in length and about the same in width, nearly orbicular, smooth, a pale greenish grey.

Habitat : It grows throughout Europe, also found in cultivated grounds from New England to Pennsylvania.

History and authority : Allens, Encyclop. Mat. Med. Vol. I, 59. Hering Guiding. Symp. Vol. I.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Aethusa Cynapium in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitre of the Mother tincture.

(b) Potencies: 2x to contain one part tincture, three part Purified Water and six parts *Strong Alcohol*. 2x and higher with *Dispensing Alcohol*.

Old method : Class III

Revised Monograph Appeared in HPI Vol. IX

AGARICUS MUSCARIUS
(Agar. m.)

Botanical name : *Amanita muscarius* Linn. **Family**: Agaricaceae

Synonyms : *Amanita muscaria* Linn, *Amanita citrina* (Schaeff.) Pers.

Common names : *English*: Bug or fly agaric; *French*: Orange fausse; *German*: Fliagenschwamm.

Description : The pileus is 7 to 13 cm broad, globose at first, then dumble in shape, convex, then expanded, nearly flat with age; margin slightly striate; the surface of the cap is covered with white floccose scales, fragments of the volva, these scales can be easily removed. The colour of the young plant is usually red, then orange to pale yellow; later in the old plants, it fades to almost white. The flesh is white, sometimes stained yellow close to the cuticle. The gills are pure white, very symmetrical, various in length, the shorter ones terminating under the cap very abruptly, crowded, free but reaching the stem decurrent in the form of lines somewhat broader in form, sometimes a slight tinge of yellow can be seen in the gills. The stem is white often yellowish with age, pity and often hollow, becoming rough and snazzy, finally scaly. The veil covers the gills in young plant and later is seen as a collar like ring on the stem. The spores are white and broadly elliptical.

Habitat : It is found in dry pine and birch forests in Northern Europe, Asia and America, abundant in pine woods in some parts of Scotland and sandy deserts in Asia.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 69. Hering Guid. Symp. Vol. I, 169.

Part used : The whole young fungus except the outer skin.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Agaricus Muscarius in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the tincture, four parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III

Revised Monograph Appeared in HPI Vol. IX

AGNUS CASTUS
(Agn. cast.)

Botanical name : *Vitex agnus castus* Linn. **Family**: Verbenaceae

Synonym : *Vitex verticillata* Linn.

Common names : *English*: Chaste tree; *French*: Gattilier Commun; *German*: Keuschlamm.

Description : A deciduous shrub or a tree of about 2 meter height. Leaves opposite, petiolate and digitate, five to seven partite, dark green on upper surface and grey on under surface, having a strong aromatic odour. Pepper-corn-like, berries purple in colour, yellowish and hard, with an aromatic odour and taste.

Habitat : Southern Europe, shores of the Mediterranean, South of France, Greece on sandy spots and the base of rocks. It is also cultivated in gardens.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 127.

Part used : The berries.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Agnus castus in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Old method : Class III.

Revised Monograph Appeared in HPI Vol. IX

ALCOHOL FORTIS – STRONG ALCOHOL
(Alc.)

Chemical Symobol : C_2H_5OH **Mol. Wt.**: 46.07

Description : A clear, colourless, mobile, volatile liquid; odour, characteristic and spirituous; taste, burning. It is miscible with water, forming clear, colourless solution, miscible with *acetone*, *ether* and *chloroform*, in all proportions. It boils at about 78° but volatilizes even at a low temperature and is readily inflammable, burning with a blue smokeless flame. It is commonly obtained by the distillation of fermented liquids, containing carbohydrates or by synthesis. It contains not less than 94.7 percent v/v or 92.0 percent w/w and not more than 95.2 percent v/v or 92.7 percent w/w of C_2H_5OH.

Identification : (i) To about 10 ml of a 0.5 percent v/v solution in *water*, add 2 ml of a 4 percent w/v solution of *sodium hydroxide* and then slowly add about 4 ml of solution of *iodine*; the odour of iodoform develops and a yellow precipitate is produced.

(ii) Refractive index n_D^{20} 1.3637 to 1.3639

(iii) Specific gravity (25°)0.8104 to 0.8075

Test for steroid : Carry out TLC method for steroid as per appendix, HPI Vol. IX. No violet coloured spot appears.

Acidity or alkalinity : 20 ml requires not more than 0.2 ml of N/10 *sodium hydroxide* to give a pink colour with *phenolphthalein* solution or not more than 0.1 ml of N/10 *hydrochloric acid* to give a red colour with *methyl red solution.*

Aldehyde : To 10 ml add 5 ml of solution of *sodium hydroxide*, shake and allow to stand for five minutes; no yellow colour is produced.

Ketones : To 1 ml add 3 ml of *water* and 10 ml of solution of *mercuric sulphate* and heat in a boiling water-bath; no precipitate is produced in 3 minutes.

Fusel oil and allied impurities : Allow 25 ml to evaporate spontaneously in a porcelain dish protected from dust until surface of the dish is barely moist; no foreign odour is perceptible and on the addition of 1 ml of *sulphuric acid*, no red or brown colour is produced.

Oily or resinous substances : Dilute 5 ml to 100 ml with *water* in a cylinder; the solution remains clear when examined against a black Background.

Non-volatile matter : When evaporated and dried at 105°, leaves not more than 0.005 percent of residue.

Preparation : Used as a vehicle.

Strong Alcohol is diluted with Purified Water to produce *dispensing / dilute alcohols.* They may be prepared as described below: The final adjustment of volume being made at the same time temperature about 20°, as that at which the Strong Alcohol is measured.

Dispensing alcohol : (90.0 percent) (limit 89.6 to 90.5 percent v/v) (Rectified spirit or 60.0 p spirit/ alcohol).

Dilute 947 ml of Strong Alcohol to 1000 ml with Purified Water. Specific gravity (20°/ 20°) 0.8289 to 0.8319.

Dilute Alcohol : (66 percent) (contains 62.5 percent v/v or 60.6 percent w/w). Dilute 695 ml of Strong Alcohol to 1000 ml with Purified Water. Specific gravity (20°/ 20°) 0.9139 to 0.9169.

Revised Monograph Appeared in HPI Vol. X

ALLIUM CEPA

(All. cepa.)

Botanical name : *Allium cepa* Linn. **Family**: Liliaceae

Common names : *Hindi*: Piyaz; *English*: Onion; *French*: Oignon; *German*: Zwiebel.

Description : A bulbous plant with a fistulous scape, swelling towards the base. The scape appears in the second year, approximately 1 meter height and is surmounted by a large globular umbel of greenish white flowers. There are many verities and the bulbs vary in size, shape (compressed, round or oblong) and colour. The bulb grows underground. The leaves are terete, fistulous pointed.

Macroscopical : The fresh onion consists of a pear shaped tunicated bulb, bearing fibrous roost from its base. The bulb consists of a compressed stem at the base covered by dry membranous scales on extreme outside and fleshy scale-leaves on upper side. Odour strong, pungent and characteristic.

Microscopical : The epidermis consists of axially elongated polygonal, tabular cells. Next to the epidermis there are number of layers of mesophyll cells in which groups of vascular bundles are scattered. The lower epidermis consists of somewhat smaller cells than the upper epidermis. The mesophyll cells contain crystals of calcium oxalate in abundance as well as oil globules.

Habitat : It is very commonly cultivated in India.

History and authority : Hering Guid. Symp. Vol. III. Allen's Encyclop. Mat. Med. Vol. I, 146.

Part used : The red, mature bulbs.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Allium Cepa, moist magma containing solids 100 g and plant moisture 567 ml	667 g
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

Revised Monograph Appeared in HPI Vol. X

ALLIUM SATIVUM
(Alli. sat.)

Botanical name : *Allium sativum* Linn. **Family**: Liliaceae

Synonyms : *Allium ophioscorodon* G. Don., *Porrum sativum* (L.) Mill.

Common names : *Hindi*: Lasan, Lasun; *English*: Garlic; *French*: Ail; *German*: Knoblauch.

Description : This is an acaulescent bulbous plant. Bulbs compound stem and grows underground; leaves linear lanceolate; spathe, one leaved, long, pointed; stem simple, 60 to 90 cm high, surrounded by sheathing leaves, seven or eight in number, all form the root stock; umbel bulbiferous-(Umbel-liferous), white flowers. The bulb is somewhat ovate, flattened below, tapering upwards and composed of small bulbs, enclosed in a three layered white membrane.

Macroscopical : Sub-globular, compound bulbs, greyish-white, 4 to 6 cm in diameter, consisting of 8 to 20 cloves, the whole surrounded by 3 to 5 whitish papery membranous scales formed from the leaf-base of the previous year's bulb and terminating in a thick papery out growth; cloves attached to a flattered circular woody axis from the underside of which arise numerous thin wiry roots and upon the upper surface of which are short-sub-cylindrical out-growths, each forming the axis of a clove, each clove ovoid and appearing 3 to 4 sided when cut transversely; the transversely cut surface showing each clove surrounded by two papery scale-leaves, the outer one whitish and loose, of the inner one pink and adherent but easily separable from the solid portion of the clove; the papery scale leaves enclosing whitish, fleshy scales, the inner one thinner and smaller than the outer, two yellowish-green, co duplicate foliage leaves in the centre.

Microscopical : The outer epidermis of the papery scales consisting of elongated sub-rectangular cells with beaded walls; polyhedral, isodiametric or transversely elongated hypodermal cells of papery scales, possessing thick walls, the longitudinal ones being beaded, each cell usually containing a single prism of calcium oxalate, about 20 to 50 µ long; elongated lignified sclerenchymatous, strongly pitted, outer epidermal cells with narrow lamina of the tough envelope of each clove; hypodermal cells of the tough envelope with small vascular bundles, mostly with spirally thickened vessels; thin walled epidermis and mesophyll of the fleshy scales of the cloves without calcium oxalate; delicate epidermis of rudimentary foliage leaves, showing stomata; distinguishable from onion chiefly by the lignified sclerenchymatous epidermal cells of the tough envelopes of the cloves.

Habitat : Universally cultivated. Native of Mediterranean region.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 160.

Part used : The mature bulb.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Allium Sativum, moist magma containing solids 100 g and plant moisture 300 ml	400 g
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III

ALOE SOCOTRINA

(Alo. soc.)

Botanical name : *Aloe succotrina* Linn. **Family**: Liliaceae

Common name : *Hindi*: Ghi kanvar, Ghikumari; *English*: Mocha, Hepatic; *French*: Aloes; *German*: Aloe.

Description : A coarse looking perennial plant with short, thick, somewhat divided stem, 30 to 60 cm high. Leaves glaucous green, sessile, crowded, lanceolate, erect, spreading, rather concave, spiny toothed at the margin, about 30 to 60 cm long, 10 cm broad and 1.8 cm thick, full of juice. Scape longer than the leaves, scaly, branched; racemes long, dense, bracts short lanceolate, membranous and longer than short pedicel. Flowers pendulous, imbricated, yellow; anthers somewhat exerted.

Macroscopical : Aloe occurs in dark chocolate-brown to black, irregular mass; surface dull, opaque with slightly vitreous appearance. Odour characteristic; taste nauseous and bitter.

Microscopical : Powder mounted in glycerin shows innumerable crystallized particles embedded in a brownish matrix or dark brown or greenish-brown glossy masses, transparent in thin fragments (Cape aloes); or hard, dark brown, opaque masses with an uneven porous fracture (Socotrina aloes); or dark reddish-brown, opaque masses with a nearly smooth and slightly porous fracture (Zanzibar aloes).

Habitat : India, East Indies, Southern and Eastern Africa, shores of Red Sea and Arabia.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 163. Hering Guid. Symp.Vol I, 126.

Part used : The inspissated juice of the leaves of Socotrina Aloes.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Aloe Socotrina in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV.

ALUMINA
(Alumin.)

Chemical symbol : $Al(OH)_3$ **Mol. wt.**: 78.120

Common names : Aluminium tryhydrate, Aluminium hydroxide; *French*: Hydrate d' alumina; *German*: Thonerdehydrate.

Description : The gel is a white, viscous suspension, translucent in thin layers from which small amounts of water may separate on standing. The dried gel is a white, odourless, tasteless, amorphous powder. It is insoluble in water and in alcohol but readily soluble in dilute mineral acids and fixed alkali. It is amphoteric in character. It is prepared by treating a hot solution of potassium alum with a hot solution of sodium carbonate. The precipitated aluminium hydroxide is then washed thoroughly to make it free of sulphates. Contains not less than 65 percent of Al_2O_3.

Identification : (i) When moistened with a solution of *cobalt nitrate*, a blue residue is produced.

(ii) A hydrochloric acid solution responds to the *tests* for *Aluminium*.

Arsenic : Not more than 1 part per million

Chlorides : Dissolve 0.5 g in 5 ml of *dilute nitric acid*, boil, cool, dilute to 100 ml with *water* and filter; 25 ml of the filtrate complies with the *limit test for chlorides*

Heavy metals : Not more than 10 parts per million

Sulphates : Dissolve 2.5 g in a 5 ml of *dilute hydrochloric acid*, boil, cool, dilute to 200 ml with *water* and filter; 10 ml of the filtrate with the addition of 2 ml of *dilute hydrochloric acid* complies with the *limit test for sulphates*

Assay : Weigh accurately about 0.2 g and dissolve in 5 ml of *hydrochloric acid* and add 50 ml of *water*. Heat to boiling, filter, wash the filter with 50 ml of *water* and add 5 drops of a solution of *methyl red*, followed by sufficient dilute *ammonia solution* to produce a distinct yellow colour in the mixture. Heat to boiling and filter. Wash with 2.5 percent w/v solution of *ammonium nitrate* until precipitate free from *chloride*. Dry the precipitate to constant weight at a temperature above 120º and then weigh the residue of Al_2O_3.

Storage : Keep in tight container and store in cool place.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 206. Hering Guid. Symp. Vol. I, 149.

Preparation : (a) Trituration 1x — Drug strength 1/10

Alumina in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method 6x may be converted to liquid 8x 9x and higher with *Dispensing Alcohol*.

Old method : Class VII

Revised Monograph Appeared in HPI Vol. IX

AMBRA GRISEA
(Ambra. gris.)

Zoological Name : *Ambra grisea.*

Common names : Ambarum, Ambra ambrosiaca, Ambra Vera, Ambra Maritima.

Description : Ambergris is found in the intestines and among the excreta of the sperm whale, *Physeter macrocephalus* Linn. It is found floating upon the sea and thrown upon the coast in tropical regions. It has many of the charachteristics of concretions and is considered to be of intestinal or biliary origin.

It is fat-like in appearance or more properly, waxy. It comes in pieces of various sizes and shapes of ash-grey colour, marbled with whitish or dark streaks and spots. Although quite friable, it is with difficulty rubbed to powder. It is without taste, has a peculiar and agreeable odour. It becomes soft at the temperature of the hand, melts in boiling water and at higher temperature is dissipated with the production of white fumes, only a trace of ash remaining. It is soluble in alcohol, either in fatty and volatile oils. Its specific gravity is 0.8 to 0.9.

Habitat : Usually found on the coast of the Indian and Pacific Oceans.

History and authority : Mentioned by Hahnemann in Mat. Med. Pura Vol. I. Allen's Encyclop. Mat. Med. Vol. I, 238.

Preparation : I (a) Trituration 1x — Drug strength 1/10

Ambra Grisea in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method 6x may be converted to liquid 8x 9x and higher with *Dispensing Alcohol*.

II (a) Mother Tincture ϕ — Drug strength 1/100

Ambra Grisea in *coarse powder*	10 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 3x and higher with *Dispensing Alcohol.*

Old method : Class VII

AMMONIUM CARBONICUM
(Am. carb.)

Chemical symbol : $NH_4HCO_3NH_4CO_2NH_2$

Common names : Ammonii carbonas, Carbonas ammonicus, Volatile salt; *French*: Carbonated' ammoniaque; *German*: Kohlensaures Ammonium.

Description : Ammonium carbonate consists of ammonium bicarbonate (NH_4HCO_3) and ammonium carbonate (NH_4COONH_2) in varying proportions. A white powder or hard, white or translucent masses, having a strong odour of ammonia. On exposure to air, it loses ammonia and carbon-dioxide, becoming opaque and is finally converted into a white powder. Soluble in 4 parts of water and is partly soluble in alcohol. It may be prepared from an intimate mixture of ammonium sulphate and calcium carbonate. It yield not less than 30 percent and not more than 33 percent of NH_3.

Identification : (i) When heated, it is volatilized without charring and the vapour is strongly alkaline to moistened *litmus paper*.

(ii) Aqueous solution of it effervesces with acids.

(iii) Yields *reactions* characteristic of *ammonium* salts.

Arsenic : Not more than 2 parts per million.

Lead : Not more than 5 parts per million.

Non-volatile matter : Leaves, when volatilized, not more than 0.01 percent of residue.

Assay : Place in a weighing bottle about 10 ml of *water*, tare the bottle and its contents, add about 2 g of *Ammonium carbonicum* (accurately weighed). Transfer the contents of the bottle to a 250 ml flask, add 50 ml of 1 N *sulphuric acid* and when solution has been affected, add *methyl orange* and titrate the excess acid with 1 N *sodium hydroxide*. Each ml of 1 N *sulphuric acid* is equivalent to 0.01703 g of NH_3.

Storage : Preserve in well-closed light resistant containers preferably and a temperature not above 30°.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 259. Hering's Guid. Symp. Vol. I, 229.

Preparation : (a) Mother Solution — Drug strength 1/10

Ammonium Carbonicum in crystalline salt	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher up to 6x with Purified Water to be prepared freshly for immediate use. 7x and higher to be prepared with *Dispensing Alcohol.*

Old method : Class Va.

AMMONIUM CAUSTICUM

(Am. caust.)

Chemical symbol : NH_4OH

Common names : Liquor ammonii fortis, Strong solution of ammonia; *French*: Eaud' ammoniaque; *German*: Ammoniak-Flussigkeit.

Description : A clear, colourless liquid; odour, strongly pungent and characteristic taste, very caustic and alkaline. Miscible with *water* in all proportions and with alcohol. Specific gravity is 0.900 to 0.915; upon exposure to air it loses *ammonia* rapidly. Contains not less than 27 percent w/w and not more than 30.0 percent w/w of NH_3.

Identification : (i) When freely diluted with *water*, it is strongly alkaline.

(ii) Dense white fumes are produced, when a glass rod dipped in *hydrochloric acid* kept near the surface of the solution.

Non-volatile matter : When evaporated to dryness on a water bath leaves not more than 0.01 percent of residue.

Arsenic : Not more than 0.4 parts per million.

Assay : Weigh accurately about 2 g in a flask containing 50 ml of 1 N *sulphuric acid* and titrate the excess of acid with 1 N *sodium hydroxide*, using a solution of *methyl red* as indicator. Each ml of 1 N *sulphuric acid* is equivalent to 0.01703 g of NH_3.

Storage : Preserve in a well-closed container in a cool place.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 283.

Preparation : (a) Mother Solution — Drug strength 1/10

Ammonium Causticum	100 g

Purified Water in sufficient quantity so as to reduce the specific gravity to 0.959.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

AMMONIUM MURIATICUM
(Am. mur.)

Chemical symbol : NH_4Cl **Mol. wt.** 53.469

Common names : Ammonii chloridum, Ammonium chloride, Sal. Ammoniacum, Sal. Ammoniac; *French*: Chlorured' ammonium; *German*: Chlorammonium.

Description : A white, crystalline granular powder, odourless taste, saline and cooling; somewhat hygroscopic. Soluble in 2.6 parts of water, in 1.4 parts of boiling water and in about 100 parts of alcohol. It contains not less than 99.5 percent of NH_4Cl, calculated on dried basis.

Identification : (i) An aqueous solution responds to the *tests* for ammonium salts.

(ii) The solution also responds to the *tests for chloride.*

Arsenic : Not more than 2 parts per million.

Iron : 1 g complies with the *limit* test for *Iron.*

Lead : Not more than 5 parts per million.

Sulphates : 1 g complies with the *limit* test for *sulphates.*

Loss on drying : Loses not more than 0.5 percent of its weight, when dried over silica gel for 4 hours.

Sulphated Ash : Not more than 0.1 percent.

Assay : Weigh accurately about 0.2 g dried to a constant weight and dissolve in 40 ml of *water*, add 3 ml of *nitric acid*, 5 ml of *nitrobenzene* and 50 ml of 0.1 N *silver nitrate*, shake vigorously for 1 minute and titrate with 0.1 N *ammonium thiocyanate*, using 2 ml of solution of *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *silver nitrate* is equivalent to 0.005346 g of NH_4Cl.

History and authority : The first proving by Nenning in Germany. Allen's Encyclop. Mat. Med. Vol. I, 286.

Preparation : (a) Mother Solution Drug strength 1/10 w/v

Ammonium Muriaticum, fresh crystals	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x with Purified Water, 4x and 5x with *Dilute Alcohol*. 6x and higher with *Dispensing Alcohol.*

Old method : Class Va.

Storage : Preserve in a well-closed container.

AMYL NITROSUM
(Am. nit.)

Chemical symbol : $C_5H_{11}NO_2$ **Mol. wt.** 117.149

Common names : Amyl nitris, Amylum nitrosum, Amyl nitrite; *French*: Azotitd' amyl; *German*: Amylnitrit.

Description : A transparent, yellowish liquid; a peculiar ethereal, fruity odour and pungent, aromatic taste. It is volatile even at low temperature and inflammable. It is practically insoluble in water; miscible with alcohol, ether and chloroform. Its specific gravity is between 0.865 and 0.875. It boils at about 97°. It slowly decomposes on exposure to air and light. It is obtained by directing nitrous vapours into isoamyl alcohol and dilute sulphuric acid. Contains not less than 90.0 percent w/w of $C_5H_{11}O_2N$.

Identification : (i) To 2 drops, add 2 drops of *water* and 2 ml of *sulphuric acid* shake and dilute with *water;* amyl valerate is produced which is recognised by its characteristic odour.

(ii) To 3 drops, add a few drops of 2 N *sodium hydroxide*, warm, dilute with *water* and cool. Add a crystal of *potassium iodide* followed by a few drops of solution of *starch* and acidify with *sulphuric acid*, a blue colour is produced.

Non-volatile matter : Leaves not more than 0.01 percent w/v of the residue when evaporated and dried to constant weight at 150°.

Water : Cool 10 ml to 0°; no cloudiness is produced.

Assay : Weigh accurately about 0.5 g, in a 100 ml graduated stoppered flask and add 10 ml of *alcohol*, 15 ml of 5.0 percent w/v solution of *potassium chlorate* and 50 ml of *dilute nitric acid*. Stopper the flask and allow to stand for 30 minutes. Add 30 ml of 0.1 N *silver nitrate solution*, shake vigorously and make up with *water* to the mark. Filter through the dried filter paper into a dry flask, discarding the first 20 ml of the filtrate. Titrate 50 ml of the filtrate with 0.1 N *ammonium thiocyanate* solution to a yellowish-pink colouration, using 5 ml of solution of *ferric-ammonium sulphate* as indicator. Perform the parallel control test under the same conditions. The difference between the titrations represents quantity of 0.1 N *silver nitrate* used by the amyl nitrite. Each ml of 0.1 N *silver nitrate* solution is equivalent to 0.03513 g of $C_5H_{11}NO_2$.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 309.

Storage : Preserve in well-closed container, protected from light and in a cool place away from fire.

Preparation : (a) Mother Solution — Drug strength 1/10

Amyl Nitrosum — 87.5 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class Via.

Revised Monograph Appeared in HPI Vol. V & VII

ANACARDIUM ORIENTALE

(Anac. or.)

Botanical name : *Semecarpus anacardium* Linn. f. **Family**: Anacardiaceae

Synonyms : *Anacardium latifolium* Linn, *A. officinarum* Gaertn.

Common names : *English*: Marking-nut; *Hindi*: Bhilawa; *French*: Acajou a' pommes; *German*: Caschunuss.

Description : It is an evergreen tree, upto 7 meter in height with rough, ash coloured bark and numerous spreading branches. The leaves are petiolate, alternate, about 45 cm long and 10 or 13 cm broad. The flowers are small and of a green-yellow colour.

Macroscopical : The fruit is borne on a pear shaped receptacle and ripen in January and February. It is a blackish-brown, heart shaped nut, with somewhat reddish tinge, containing corrosive resinous juice in cells, between the hard outer shell and the sweet kernel. The juice is at first of a light colour of the consistency of honey, becoming brown on drying. It is not soluble water and only in 90 percent alcohol, after it has been made alkaline.

Identification : Macerate 5 g with 50 ml. of 90 percent *alcohol* for overnight and filter.

(i) To 5 ml of filtrate, add 10 drops of dilute HCl; no change of colour.

(ii) To 5 ml of the filtrate, add 5 drops of ferric chloride solution (5 percent freshly prepared); black precipitate formed immediately.

Habitat : It is commonly found in India and in mountainous forests of Asia.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 312. Hering Guid. Symp. Vol. I, 285.

Part used : The resinous juice of the seed.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Anacardium Orientale 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV.

Revised Monograph Appeared in HPI Vol. X

ANDROGRAPHIS PANICULATA

(Andro. pan**.)**

Botanical name : *Andrographis paniculata* Wall. ex. Nees **Family**: Acanthaceae.

Common names : *Hindi*: Kalmegh, Kiryat, Kirata.

Description : An erect annual, 30 to 90 cm high, branches sharply four angled or almost winged. Leaves 5.8 cm long, lanceolate, acute, tapering to the base, pale beneath, main lateral nerves 4 to 6 pairs, petioles none or upto 0.6 mm long. Flowers small, solitary, arranged in lax spreading axillary and terminal racemes or panicles, pedicles, the pedicles distinct gland-pubescent; bracts 2.5 mm long, lanceolate, bracteoles smaller or none. Calyx 3 mm long, segments equal, linear-lanceolate; Corolla pink, 1 cm long hairy outside, tube 5 mm long, dilated below the limb. Filaments hairy upwards, rugose and glabrous.

Microscopical : Leaf trichomes are of two types, glandular and non-glandular. The glandular hairs have a short stalk of a single cell and upto 20 µ long with a head of eight cells appearing as disc-shaped in surface view. The covering trichomes are 1 to 3 celled. Glandular trichomes are distributed throughout the lower surface and on the mid-rib, on the upper surface. Covering trichomes are distributed on the upper surface mostly towards the margin. Upper epidermis has cells with more or less straight walls and walls of lower epidermal cells are sinuous. Stomata caryophyllaceous; stomatal index 16 to 24 and the stomata occur in the abaxial epidermis; cystoliths present in the epidermis. Mesophyll with a single layer palisade cells; palisade ratio 3 to 5.5. Mid-rib varies in outline at different parts of the leaf. A large fan shaped vascular bundle is present into the centre of the mid-rib and is surrounded by a layer of pericycle on the side. Stem with trichomes as in leaf, covering trichomes, mostly unicellular, cortical collenchymas occurring in small strands below the epidermis and also filling the whole inner space of the bulges; endodermis distinct with casparian dots; secondary phloem contains acicular fibres. The vascular bundle is ectopholic siphonostele; small acicular crystals of calcium oxalate present in pith and cortex.

Habitat : In the plains, throughout India.

History and authority : Proved at Midnapore Homoeopathic Medical College Research Centre.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Andrographis Paniculata, moist magma containing solids 100 g and plant moisture 300 ml	400 g
Purified Water	100 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2X with *dilute alcohol*. 3X and higher with *Dispensing Alcohol*.

Old method : Class III.

ANTIMONIUM ARSENICICUM

(Ant. ars.)

Chemical symbol : $SbAsO_4$ **Mol. wt.** 260.669

Common names : Antimonium Arsenate, Antimony Arsenate.

Description : A heavy, white powder, consisting of approximately 56.0 percent antimony trioxide (Sb_2O_3) and 44 percent arsenic pentoxide (As_2O_5). It is obtained by precipitating a solution of tartar emetic with arsenic acid. It is insoluble in water and in alcohol. Poison!

Identification : It responds to the reactions characteristic of antimony salt and of *arsenates*.

Assay : About 0.5 g accurately weighed, is dissolved in 20 ml of concentrated nitric acid and a slight excess of an accurately measured volume of neutral *silver nitrate solution,* is vigorously stirred in and the precipitate of silver arsenate is allowed to settle in the dark. The supernatent liquid is poured off through a filter and the precipitate washed by decantation with cold purified water, then thrown on the filter and washed free of silver nitrate. The funnel is filled with water and 20 ml of *concentrated nitric acid* added. The dissolved silver arsenate is collected in the original beaker, in which the precipitation was made, the residue on the filter is thoroughly washed with cold water and the filtrate, washings made upto 100 ml. The solution is now titrated by addition of standard *ammonium* or *potassium thiocyanate* until a faint red colour is evident, using *ferric ammonium alum* as indicator. Each ml of 0.1 N *thiocyanate* is equivalent to 0.08960 g of $SbAsO_4$.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 362. Haarer is the chief authority for this drug.

Preparation : (a) Trituration 1C — Drug strength 1/100

Antimonium Arsenicicum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method.6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

Caution : Not to be prescribed below 3x.

ANTIMONIUM CRUDUM
(Ant. cr.)

Chemical symbol : Sb_2S_3 **Mol. wt.**: 339.692

Common names : Antimonii sulphidum, Antimonium sulphuratum, Stibium sulphuratum nigrum, Antimony sulphide, Tri-sulphide of antimony; *French*: Sulfured' antimoine; *German*: Schwefelspiessglanz.

Description : A grey or greyish-black, lustrous, crytsalline mass, when obtained from natural sources; when pulverised, it is of an iron-gray colour. It is insoluble in water; soluble in concentrated hydrochloric acid with the evolution of hydrogen sulphide through a solution of an antimonous compound. It is also found in nature and is purified by fusion. Contains not less than 99.0 percent of Sb_2S_3.

Identification : A *solution in hydrochloric acid* responds to the tests characteristic of antimony.

Assay : About 0.5 g, accurately weighed, is dissolved in sufficient quantity of *sodium hydroxide solution*. The solution is then made mildly acid with some *hydrochloric acid* and *hydrogen sulphide gas* is passed through the solution. The orange red precipitate of antimony sulphite is filtered, washed, dried and weighed.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 363.

Preparation : (a) Trituratin lx Drug strength 1/10

Antimonium Crudum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

ANTIMONIUM TARTARICUM

(Ant. tart)

Chemical symbol : $K(SbO)C_4H_4O_6.½H_2O$ **Mol. wt.**: 333.932

Common names : Antimonii et potassii tartars, Tartrate of antimony and potassium, Tartar Emetic; *French*: Tartrated' antimone et de postassee; *German*: Brechweinstein.

Description : A colourless, transparent crystals or a white, granular, odourless powder, having a sweet, metallic taste. The crystals effloresce upon exposure to air. It is soluble in 12 parts of water and 3 parts of boiling water; insoluble in alcohol. Its aqueous solution is slightly acidic. It may be prepared by dissolving a mixture of 10 parts of potassium bitartrate with 8 parts of antimony trioxide in 75 parts of boiling water, filtering while hot and allowing it to crystallise. Contains not less than 99.0 percent of $K(SbO)C_4H_4O_6.½H_2O$.

Identification : (i) Aqueous solution responds to the *tests* characteristic of antimony and of tartarates.

(ii) An acidic solution gives orange-red precipitates with *hydrogen sulphide.*

Arsenic : Not more than 10 parts per million.

Lead : Not more than 5 parts per million.

Assay : Dissolve about 0.5 g accurately weighed, in 50 ml of water, add about 2 g of *sodium bicarbonate* and titrate with 0.1 N *iodine* using *mucilage of starch* as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.01670 g of $K(SbO)C_4H_4O_6.½H_2O$.

History and authority : The drug appears first in Homoeopathic Materia Medica in Hartlaub & Trinks. Allen's Encyclop. Mat. Med. Vol. I, 379.

Preparation : (a) Trituration 1x — Drug strength 1/10

Antimonium Tartaricum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

APIS MELLIFICA
(Apis. mel.)

Zoological Name : *Apis mellifica* Linnaeus, 1758 **Family**: Hymenopterae

Common names : *Hindi*: Madhu Makkhee; *English*: Honey Bee, Common Hive Bee; *French*: Abeille; *German*: Honing Biene.

Description : Under Apidae there are three general groups; Melipona (stingless bees), Bombus (Bomble bees) and the Apis (honey bees). The genus *Apis* is of European origin and is widely distributed throughout civilized world. A swarm of bees consist of queen bee, several hundred drones and ten thousand or more workers.The queen bees are the perfectly developed female. The drones are male, the workers female. The bees have three parts of body which are well separated by constrictions. The head carries the eyes, antennae and mouthparts; the thorax, wings and legs; the abdomen, wax glands and sting. The Bees are hairy which are branched or feathery. The eyes of male are united above, the mouthpart nearly aborted and the hind legs are smooth. There are two paraglosae on the lingula in the female and the maxillary palpi are one jointed. The shorter abdomen of the female marks the external difference from the male. This species is without terminal spurs on hind legs. Only queens and workers have poison apparatus, commonly called the sting.

Habitat : India and also in other parts of the world.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 400.

Part used : The live bees.

Preparation : Place live bees in a clean, wide mouthed container preferably of glass. After irritating them by shaking, the menstrum should be poured in and the whole allowed to macerate for ten days, being shaken twice daily. The resulting tincture should be poured off and filtered. The bees should not be pressed. The drug strength of the tincture varies depending on the season of the year, when the bees are secured. When they are dormant, their poisons are supposed to be less virulent.

(a) Mother Tincture ϕ — Drug strength 1/10

Apis Mellifica, moist magma containing solids 100 g, moisture 150 ml	250 g
Glycerin	225 ml
Purified Water	225 ml
Strong Alcohol	425 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x with *dilute alcohol*. 4x and higher with *Dispensing Alcohol*.

Old method : Class IV.

Caution : Not to be prescribed below 3x.

Revised Monograph Appeared in HPI Vol. VII & X

APOCYNUM CANNABINUM
(Apoc. can.)

Botanical name : *Apocynum cannabinum* Linn. **Family**: Apocynaceae

Synonyms : *Apocynum hypercifollum* Ait, *Apocynum sibiricum* Jacq, *Apocynum pubescens* R. Br.

Common names : *English*: Indian Hemp; *French*: Chanre du candad; *German*: Andische Hanfwurzel.

Description : A deciduous, perennial herb; stem erect, glabrous or downy pubescent, upto 1.25 meter high, branched above in long, slender branches, root creeping, rarely branched, longitudinally wrinkled, grayish-brown externally, yellow soft, porous wood; leaves opposite, petiolate, varying form nearly oval to oblong and sometimes lanceolate, sessile or nearly so, flowers greenish-white and appears from June to September in terminal and lateral cymes; fruits is in pods, 7.5 to 12.5 cm long, slender and pendulous.

Macroscopical : The drug occurs as cylindrical, sometimes branched, segment of rhizomes and roots of varying length and upto 1.5 cm in diameter, rhizome vertical; *Apocynum* gummiferous root horizontal, externally reddish-brown to brownish, longitudinally wrinkled, transversely fissured.

Microscopical : Section of rhizome and gummiferous root exhibit the following: the cork of 5 to 15 layers of tangentially elongated cells with slightly lignified walls. Cortex, a zone of starch-bearing parenchyma; numerous, thick walled, tabular, latex-cells and resin-cells. Phloem, a narrow zone separated into oblong phloem patches by narrow phloem rays, the latter to 3 cells wide. Cambium of meristematic cells. Xylem, a broad zone of narrow wood wedges separated by narrow medullary rays. The wood wedges contain numerous wood fibres and large tracheids with simple slits and bordered pits.

Habitat : Borders of thickets. Common in hedges and fields from Maine to Florida (USA) in dry, sandy soil. Also common on river banks of streams, moist grounds of U.S.A. and Canada.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 425. Hering's Guid. Symp. Vol. I, 488.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Apocynum Cannabinum in *coarse powder* 100 g

Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol*.

Old method : Class III.

Revised Monograph Appeared in HPI Vol. IX

ARALIA RACEMOSA

(Aral. rec.)

Botanical name : *Aralia racemosa* Linn. **Family**: Araliaceae

Common names : Spikenard, American spikenard, Indian Spikenard; *English*: Spikenard; *French*: Nard Americain; *German*: Amerikenische Narde.

Description : An aromatic, perennial, deciduous herb, growing 1 to 2 meter in height; stem ligneously herbaceous, smooth, bifurcating, much branched and devoid of prickles; root large, thick, whitish internally; leaves very large, odd-pinnately compound; leaflets ovate-cordate, doubly serrate, acuminate, slightly downy; flowers small, greenish-yellow, monoeciously polygamous or perfect, appearing in July; fruit globular, dark purplish to reddish brown, aromatic, baccate drupes retaining the persistent calyx and divariacate styles.

Macroscopical : Roots large, thick (about 25 mm at the base), pale brown, wrinkled, with fracture short, whitish and in transverse section yellow resinous cells can be seen, it readily peels off the layer surrounding the main bulk of the root, the central portion is somewhat dense, dotted with scattered bundles of woody fibre and surrounded by ligneous sheath 1 mm thick.

Habitat : Rocky wood in North America.

History and authority : Allen's Encyclop. Mat. Med. Vol. X 323.

Part used : Root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aralia Racemosa in *coarse powder*	100 g
Purified Water	150 ml
Strong Alcohol	870 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class III.

ARGENTUM METALLICUM
(Arg. met.)

Chemical symbol : Ag **At. wt.**: 107.87

Common names : Silver; *French*: Argent; *German*: Silber.

Description : A white, brilliant, tenacious, ductile metal; tasteless and odourless. Next to gold, it is the most malleable and ductile of all metals. It is insoluble in water, alcohol and in most acids; readily soluble in dilute nitric acid and in hot sulphuric acid. Its specific gravity is 10.49. It melts at 960.5^{o} and boils at 1950°. It does not oxidise in air, but is tarnished quickly by hydrogen sulphide. It is prepared from native silver ores.

Identification : (i) Solution in nitric acid gives a heavy, white, curdy precipitate with solution of soluble chloride or hydrochloric acid. The precipitate is soluble in *ammonium hydroxide*.

(ii) An ammonical solution when treated with a small quantity of *formaldehyde* and warmed causes the formation of a *silver* mirror on the walls of the test tube.

Assay : About 0.32 g, accurately weighed is dissolve in sufficient quantity of *dilute nitric acid* (Sp. Gr. 1.2). Titrate with 0.1 N *ammonium thiocyanate* using solution of *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *ammonium thiocyanate* is equivalent to 0.010788 g of Ag.

Caution : Inhalation of dust should be avoided.

History and authority : Allen's Encyclop. Mat. Mad. Vol. I, 436.

Preparation : (a) Trituration 1x Drug strength 1/10

Argentum Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

ARGENTUM NITRICUM
(Arg. nit.)

Chemical symbol : $AgNO_3$ **Mol. wt.**: 169.875

Common names : Argenti Nitrus, Silver nitrate; *French*: Azotated' argent; *German*: Silbernitrat.

Description : A colourless or white crystals; odourless, having a bitter caustic, metallic taste. Soluble in 0.4 part of water, in slightly more than 0.1 part of boiling water and in 30 parts of alcohol. Its specific gravity is 4.3. It melts at 212° into a slightly yellow liquid. It is obtained by the action of nitric acid on silver. Silver nitrate, powdered and then dried in the dark, over silica gel, for 4 hours, contains not less than 99 percent of $AgNO_3$.

Identification : (i) With *sodium chloride* its aqueous solution gives an abundant white precipitate, soluble in ammonia.

(ii) It responds to the *tests* characteristic of silver and of nitrates.

(iii) A solution in water is clear and colourless and neutral to litmus.

Bismuth, copper and lead : To a solution of 1 g in 5 ml of *water*, add a slight excess of dilute ammonia solution; the mixture remains clear and colourless.

Assay : Weigh accurately about 0.5 g and dissolve in 50 ml of *water*, add 2 ml of *nitric acid*, titrate with 0.1 N *ammonium thiocyanate* using solution of *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *ammonium thiocyanate* is equivalent to 0.10699 g of $AgNO_3$.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 452.

Preparation : (a) Mother Solution — Drug strength 1/10

Argentum Nitricum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x to 4x with Purified Water, 5x with *dilute alcohol*. 6x and above with *Dispensing Alcohol*.

(c) Trituration: 1x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x higher with *Dispensing Alcohol*.

Storage : Argentum Nitricum and its preparations up to 6x potency to be kept in well-closed container protected from light.

ARNICA MONTANA

(Arn. mont.)

Botanical name : *Arnica montana* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Crysanthemum latifolium* (DC) Baksay, *Doronicum auftriacum quartum* Cluf. Pan., *D. montanum* Lam.

Common names : *English*: Celtic nard, Leopard's bane, Mountain arnica, Mountain tobacco; *French*: Arnique; *German*: Arnika, Wohlverleth.

Description : A perennial herb with a creeping, slender, blackish rhizome, 2 to 5 cm long and 5 mm in thickness, giving from its sides and undersurface numerous dark brittle, wiry, curved and twisted roots, about 8 cm in length; the scars that are left by their removal together with encircling scares of cataphyllary leaves, render the surface of the rhizome, which is in addition longitudinally shriveled, distinctly rough.

Stem: 25 to 30 cm high, erect, pubescent, rough, striated, either simple or with one pair of opposite branches. Leaves 10 to 20 cm long, are few, entire, sessile opposite, obovate; radical ones crowded at the base, the upper smaller than the rest. The heads, 5 to 6 cm wide, large and solitary at the summit of the stem and lateral branches. The involucre is cylindrical, dull green, with purplish points and hairy. The ligulate florets are in single row of sixteen to twenty; calyx represented by a pappus numerous bristles, each of which is 4 to 5 cells in diameter and minutely denticulate on the surface; strap of the corolla about 2 to 3 cm long and 3 to 5 mm wide, with 3 acute teeth at the apex and 7 to 9 veins, sometimes 4 to 5 teeth and upto 15 veins; stamens absent; ovary inferior, 5.5 to 7.5 mm long, five-ribbed unilocular, the wall bearing numerous appressed twin trichomes, each composed of 2 cells which diverge at the tips; style filiform, stigma bi-fid and spreading. Tubular floret has a regular, 5 toothed, yellow, tubular corolla about 7 to 8 mm long; 5 epipetalous stamens with syngenesious anthers; pappus and ovary as in ligulate florets. The drug as a whole has a faint, but rather agreeable apple like odour and bitter, acrid taste. Flowers too have a pleasant sweet and aromatic odour and bitter, acrid taste.

Microscopical : The smoothed transverse section of rhizome shows, externally thin-layer of brown cork, a fairly wide whitish cortex in the inner layers of which is a circle of dark resin ducts; a circle of about 20 vascular bundles having a yellowish xylem and separated by fairly wide medullary rays and a large whitish central pith.

Habitat : Moist, upland meadows of the cooler parts of Europe, a plant of hills in Central Europe. It extends through Russia to Siberia. It is also found sparsely in the North Western part of U.S.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 476.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Arnica Montana in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III.

ARSENICUM ALBUM
(Ars. alb.)

Chemical symbol : As_2O_3 **Mol wt.**: 197.841

Common names : Acidum arsenicum, White arsenic, Arsenious acid; *French*: Acide arsenieux, Arsenic blanc; *German*: Arsenige Saure.

Description : A white or transparent amorphous lumps or crystalline powder; odourless, stable in air. Poison! It is slowly soluble in water. The amorphous variety being more soluble than crystalline variety. It is sparingly soluble in alcohol. It is completely soluble in glycerine. It may be obtained by roasting certain arsenical ores. Arsenic trioxide, dried at 105° for 2 hours contains not less than 99.8 percent of As_2O_3.

Identification : (i) Sublimes, on heating, with the formation of transparent octahedral crystals.

(ii) A small quantity warmed with about 5 ml of *hydrochloric acid*, gives a brown coloured or white precipitate on the addition of few drops of *solution of stannous chloride*.

(iii) An acidified solution gives yellow precipitate with *hydrogen sulphide*.

Non-volatile matter : Leaves not more than 0.1 percent of the residue.

Assay : Dissolve about 0.2 g accurately weighed, in 20 ml of boiling *water*, 5 ml of 1 N *sodium hydroxide*, cool; add 5 ml of 1 N *hydrochloric acid* followed by about 3 g of *sodium bicarbonate* and titrate the mixture with 0.1 N *iodine* using starch as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.004946 g of As_2O_3.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 496.

Preparation : (a) Mother Solution — Drug strength 1/100

Arsenicum Album in fine powder	10 g
Glycerine	100 ml
Strong Alcohol	100 ml
Purified Water in sufficient quantity (about 800 ml).	

to make one thousand millilitres of the Mother Solution.

Heat fine powder of *Arsenicum Album* with *Glycerine* at 100° until a clear solution is obtained. Cool this solution and add to it 750 ml of Purified Water and 100 ml of strong alcohol. Mix well. Bring the

volume to one thousand millilitres by adding Purified Water if found necessary.

(b) Potency: 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1C	Drug strength 1/100
Arsenicum Album in fine powder	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(d) Potency: 3x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

Old method : Class VI (solution).

Caution : Not to be prescribed below 3x.

ARSENICUM IODATUM

(Ars. iod.)

Chemical symbol : AsI_3 **Mol. wt.**: 455.635

Common names : Arseni iodidum, Arsenici iodidum, Arsenious iodide; *French*: Iodure d' arsenic; *German*: Arsenikjodur.

Description : An orange-red coloured crystals, having the odour of iodine: gradually losing iodine on exposure to air. Posion! It is soluble in 12 parts of water with partial decomposition. It is soluble in 30 parts of alcohol; soluble in ether, chloroform and carbon disulphide. Its aqueous solution is yellow. Its specific gravity is 4.39 and melts at 146°. It is prepared by treating arsenic with a solution of iodine in carbol-di-sulphide. Contains not less than 97 percent of AsI_3.

Identification : (i) With *nitric acid*, it emits violet vapours of iodine.

(ii) Its aqueous solution is strongly acid and colourless but becomes yellow on keeping.

(iii) Sublimes when heated slowly but decomposes, if heated rapidly.

Assay : Dissolve about 0.5 g, accurately weighed in 50 ml of water, add about 2 g of *sodium bicarbonate* and titrate with 0.1 N *iodine*, using *starch solution* as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.0227 g of AsI_3.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 552.

Preparation : (a) Trituration 1C — Drug strength 1/100

Arsenicum Iodatum crystals	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

Caution : Not to be prescribed below 3x.

ARSENICUM SULPHURATUM FLAVUM

(Ars. s. f.)

Chemical symbol : As_2S_3 **Mol. wt.**: 246.035

Common names : Arsenii sulphidium, Arsenic trisulphide, Yellow sulphide of arsenic, Orpiment; *French*: Sulfure jaune d' arsenic; *German*: Sulfide arsenieux, Goldgelb.

Description : A yellow or orange powder; odourless. Poison! It is insoluble in *water* and *alcohol*; soluble in alkalies; slowly soluble in hot *hydrochloric acid* and decomposes in boiling dilute *nitric acid* with separation of *sulphur*. Its specific gravity is 3.43 and melts at 300°. It is found in nature and is also prepared by the action of *hydrogen sulphide* on aqueous solution of *arsenious oxide*. Contains not less than 98 percent of As_2S_3.

Identification : (i) When heated with *charcoal*, it is reduced to the metallic State.

(ii) It responds to all the tests characteristic of *arsenic*.

Assay : Dissolve about 0.5 g accurately weighed, in 50 ml of *water*, to which is added about 2 g of *sodium bicarbonate*. Titrate with 0.1 N *iodine* using starch as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.00615 g of As_2S_3.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 556.

Preparation : (a) Trituration 1C Drug strength 1/100

Arsenicum Sulphuratum flavum in *coarse powder*	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

Caution : Not to be prescribed below 2x.

Revised Monograph Appeared in HPI Vol. X

ARSENICUM SULPHURATUM RUBRUM

(Ars. s. r.)

Chemical symbol : As_2S_3 **Mol. wt.**: 213.971

Common names : Arsenicum rubrum, Rubinus arsenicalis, Bisulphide of arsenic Realgar; *French*: Rubis d' arsenic; *German*: Sulphied hypoarsenieux.

Description : An orange red prism or ruby red amorphous mass. Poison! It is insoluble in *water*; soluble in alkali hydroxides; slowly in hot *hydrochloric acid* and decomposed by dilute nitric acid. Its specific gravity is 3.51 and melts at 307°. It is prepared by fusing together five parts of arsenious acid and three parts of sulphur.

Identification : (i) It responds to all the *tests* characteristic of arsenic.

(ii) It ignites at high temperature and burns with a blue flame.

Assay : Dissolve about 0.5g accurately weighed in 50 ml of *water* to which is added about 2 g of *sodium bicarbonate*. Titrate with 0.1 N *iodine* using starch as indicator. Each ml. of 0.1 N *iodine* is equivalent to 0.003 g of As_2S_3.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 557.

Preparation : (a) Trituration 1C Drug strength 1/100

Arsenicum Sulphuratum Rubrum in *coarse powder*	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

Caution : Not to be prescribed below 2x.

Revised Monograph Appeared in HPI Vol. IX

ARTEMISIA VULGARIS
(Art. vul.)

Botanical name : *Artemisia vulgaris* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Artemisia heterophyllus* Nutt., *A. indica* willd.

Common names : *Hindi*: Nagadouna; *English*: Mugwort; *French*: Couronne de saint Jean; *German*: Beifuss.

Description : A perennial, aromatic, shrub like herb with creeping root. Stem 1 meter or more in height furrowed and loosely branched; lower leaves petioled, 5 to 10 cm long, ovate, 1 to 2 pinnatifid, with stipule-like lobes at the base, more or less pubescent above, white tomentose beneath, the upper lanceolets, entire or 3-fid. Heads sessile or shortly pedicelled, ovoid or sub-globose, arranged in a sub-secund spike like, sub-erect or horizontal panicled racemes. Involucre bracts weely or glabrous; outer small or herbaceous, inner mostly scarious. Outer female flowers vary slender, inner hermaphrodite flowers fertile. Achenium minute.

Habitat : Naturalised from Europe. In Canada and states, found in waste places, on banks of streams, road sides, near dwellings. Common in mountainous region of India up to 2000 m

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 558.

Part used : The roots (collected in dry season) taking care not to wash them.

Preparation : (a) Mother Tincture ϕ

	Drug strength 1/10
Artemisia Vulgaris in *coarse powder*	100 g
Purified Water	333 ml
Strong Alcohol	694 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

ARUM TRIPHYLLUM

(Arum. tri.)

Botanical name : *Arisaema triphyllum* Schott. **Family**: Araceae

Common names : *English*: Bog Onion, Canada Turnip, Dragon's Root, Dragon's Turnip, Indian Turnip; *French*: Gouet at trois feuilles; *German*: Dreiblattriger Aron.

Description : A perennial, deciduous herb. The root turnip shaped corm, the lower and larger parts tuberous and fleshy, with the stalks. Generally 2 opposite on long, sheathing foot-stalks are present. Spadix often dioecious, club-shaped obtuse, much shorter than the spathe, the later being flattened and incurred, hooded at the summit with the petiole and sheath green or often variegated with dark purple or whitish stripes or spots. Flowering from May to June.

Habitat : Indigenous to United States and Canada. Found in rich woods and wet places.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 561.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Arum Triphyllum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III.

ASAFOETIDA

(Asaf.)

Botanical name : *Ferula asafoetida* Linn. **Family**: Umbelliferae (Apiaceae)

Synonyms : *F. narthex* Base, *F. persica* Willd, *F. foetida* St., *Narthex asafoetida* Fale, *Scordorma foetidum* Bunge.

Common names : *Hindi*: Heeng; *English*: Assafetida; *French*: Asefetide; *German*: Asant Stinkasant.

Description : Asafoetida is an oleo-gum-resin. The gum resin is an amorphous mass. Asafoetida occurs in three forms, *viz*. paste, tear and mass (block or lump). Paste and tear pure forms, but bulk of the drug is mass. The tears, some of which are separate, some more or less agglutinated together, are rounded or flattened and vary from 0.5 to 4 cm in diameter. These are of a dull yellow or sometimes dingy grey colour; some darkens on keeping, finally becoming reddish-brown, but other retains their original colour for years. The red variety is derived from *F. foetida* and the white from *F. rubricaulis* (Small, 1913). When fresh they are usually tough at ordinary temperatures, becoming harder when cooled and softer when warmed. Internally they may be yellowish or milky-white, translucent or opaque; the fleshly exposed surface may gradually pass through very characteristic change of colour, becoming first pink then red and finally reddish-brown (*F. foetida*) or may remain nearly white (*F. rubricaulis*). Mass asafoetida consists of the tears agglutinated into a more or less uniform mass and mixed with varying quantities of extraneous substances such as stones, slices of the root, earthly matter, calcium carbonate and calcium sulphate etc; it is generally much inferior to the tears, the drug itself has an intense penetrating, persistent, alliaceous, odour and bitter acrid, alliaceous tests.

Habitat : India (Kashmir, mountains in the South East of Samar Kand), Iran and Afghanistan.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 560.

Part used : Gum resin.

Preparation : (a) Mother tincture ϕ — Drug strength 1/10

Asafoetida in *coarse powder* — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Old method : Class IV.

AURUM METALLICUM

(Aur met.)

Chemical symbol : Au **At. wt.**: 196.967

Common names : Aurum precipitatum, Aurum foliatum, Precipitated gold, Gold Leaf; *French* or *German*: Gold.

Description : A bright yellow metal; most malleable and ductile; in powdered form is brown. It is not attacked by air or by hydrogen sulphide. Ordinary acids do not attack; soluble in *aqua-regia*. Its specific gravity is 19.3. It melts at 1063° and boils at about 2600°. Gold generally occurs in the free state and its commercial purification commonly effected electrolytically.

Identification : (i) With *sodium hydroxide, solutions* of gold salts gives a brown precipitate which is soluble in excess of the reagent.

(ii) When treated with *stannous chloride*, solution of salt in *aqua-regia* slowly forms a purple precipitate (purple of Cassius).

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 1.

Preparation : (a) Trituration 1x Drug strength 1/10

Aurum Metallicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

AURUM MURIATICUM
(Aur. mur.)

Chemical symbol : $AuCl_3.2H_2O$ **Mol. wt.**: 339.357

Common names : Aurichloridum, Gold chloride, Gold trichloride; *French*: Chlorure d'or; *German*: Goldchlorid.

Description : A yellow orange, reddish-yellow or dark orange-red crystals; strong metallic taste, deliquescent in moist air. It is soluble in water and in alcohol. Its aqueous solution stains the skin purple. It is prepared from metallic gold and iodine-monochloride. Contains not less than 48 percent of Au.

Identification : It responds to the *reactions* characteristic of gold and of chlorides.

Foreign metals : The filtrate obtained in the '*assay*' (see below) does not darken when *hydrogen sulphide* is passed through it for few seconds, nor on further treatment with *dilute ammonia solution* in excess.

Assay : Dissolve about 0.5 g accurately weighed in 50 ml of *water*, add 10 ml of 0.1 N *sodium hydroxide*, 10 ml of *solution of hydrogen peroxide*, boil until the excess of *hydrogen peroxide* is destroyed, acidify with *dilute hydrochloric acid*, filter off precipitated gold, wash with water, dry and ignite to constant weight and weigh.

Storage : Keep well closed and protected from light.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 14.

Preparation : (a) Mother Solution — Drug strength 1/10

Aurum Muriaticum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class Va.

AVENA SATIVA
(Aven. sat.)

Botanical name : *Avena sativa* Linn. **Family**: Graminae (Poaceae)

Common names : *Hindi*: Jey; *English*: Oat; *French*: Farine d' Avoine; *German*: Hafermehl.

Description : Annual grass, culms terete, erect, 60 to 120 cm high. Leaves few, alternate, 15 cm long, sheaths long, split or bent on side opposite blade. Spiklets pendulous, about 2.5 cm long without 13 to 18 mm exserted awn. Glumes very long-acuminate. Rachilla tenacious or disarticulating below glums III. Every tip villous.

Macroscopical : Whole oat occurs as a somewhat spindle shaped, light yellowish-brown to light greenish-yellow; grain upto 1.5 cm in length and about 3 mm broad, enveloped by chaff consisting of larger scale or lemma (flowering glume), a palet. The front or naked grain is tapered toward either end exhibit a distinct longitudinal groove on its ventral side at the micropylar end of which occurs a wart-like out growth or caruncle and at summit a "beard" of long slender hairs.

Microscopical : Fruit: epicarp of longitudinally elongated, thin-walled cells, except at apex and base where they are more or less isodiametric, from a number of these arise slender pointed unicellular, non glandular hairs, up to 2 mm in length. Other layers of caricarp, the spermoderm and perisperm of collapsed or poorly defined cells. Endosperm consisting of an outer layer of aleurone cells with walls, the remainder of the tissue composed of large, thin-walled parenchymatous cells, filled with polygonal and spindle shaped starch grains, the starch grains being frequently gathered in ellipsoded or rounded aggregates. Embryo forming a broad, spindle shaped region about 2 mm in length and found embedded in the endosperm near the micropylar end.

Habitat : India and cultivated in all temperate climates.

History and authority : A dictionary of Practical Materia Medica, Clarke's Vol. I, 234.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Avena Sativa in fine powder	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III.

Revised Monograph Appeared in HPI Vol. VIII

AZADIRACHTA INDICA

(Azad. ind.)

Botanical name : *Azadirachta indica* A. Juss. **Family**: Meliaceae

Synonym : *Melia azadirachta* Linn.

Common names : *Hindi*: Nimba, Nim.

Description : A large evergreen tree, upto 15 meter in height, with a straight trunk. Leaves simply pinnate, 20 to 38 cm long, crowded near the ends of branches; leaflets 9 to 12, sub-opposite, 2.5 to 7.5 by 1 to 4 cm, obliquely lanceolate, sometime felcate, acuminate, serrate, glabrous on both surfaces, base inequilateral, acute; petioles very short. Flowers white, fragrant, in branched glabrous panicles shorter than leaves; bracts minute, lanceolate caducous. Calyx puberulous outside, divided almost to the base, lobed rotund-ovate. Petals 1 cm long obovate-oblong, faintly puberulous, outside ciliolate. Staminal tube glabrous, a little shorter than petals; anthers 10. Ovary glabrous, 3-celled; 20 ovules in each cell; stigma 3-teethed. Drupes the shape of an olive, upto 2 cm long, glabrous 1-seeded.

Macroscopical : The bark has a dark grey to greyish black colour, rough, feebly fissured and exfoliating. The entire bark comparatively thin about 10 mm. The outer bark constitutes nearly half the thickness of the entire bark. It is not easily detachable from the tissues within and its inner surface is pinkish brown. The inner region is fibrous.

Microscopical : In old barks there is a well defined outer rind formed of alternating strips of cork layers and dead secondary bast. The cork tissue is composed of rectangular cells, often with reddish brown contents. Phellogen is not very distinct and a secondary cortex is not normally present. The secondary bast is found next within composed of groups of sclerenchyma, medullary rays; in the older barks collapsed and compressed phloem tissue is also present. The phloem parenchyma cells are fully packed with compound starch grains. Medullary rays are usually 2 to 5 seriate.

Habitat : Usually planted throughout India.

History and authority : Drugs of Hindoostan by Dr. S. C. Ghose.

Part used : Fresh Bark.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Azadirachta Indica, moist magma containing plant moisture 25 ml and solids 100 g	125 g

Purified Water	375 ml
Strong Alcohol	635 ml

to make one thousand millilitres to the Mother Tincture.

(b) Potencies: 2x with dilute alcohol. 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IX

BAPTISIA TINCTORIA
(Bapt.)

Botanical name : *Baptisia tinctoria* Vent. **Family**: Leguminosae (Fabaceae)

Synonym : *Sophora tinctoria* Linn.

Common names : *English*: Wild indigo; *French*: Indigo sauvage; *German*: Baptisie.

Description : An erect, perennial herb, planted as an ornamental plant, glabrous and somewhat glaucous, much branched, 1.5 meter in height. Leaves palmately compound are made up of 3 leaflets, leaflets cuneate-obovate; about 1.5 cm long, obtuse, stipules very small and caducous. Flowers bright yellow, about 1.25 cm long, few in racemes. Each flower has an erect petal not much larger than the straight, lateral petals and keel. Pod sub-globose or ovoid, 1.25 cm or less long, with slender beak.

Macroscopical : Fleshy up to 4 cm in thickness, usually cut into the elongated cylindrical segments, the crown form 5 to 8 cm in thickness, more or less warty and marked by stem scars; outer surface dark brown; usually longitudinally wrinkled, transversely warty or the thicker pieces covered with soft corky layer, fracture though and surface whitish.

Microscopical : Powder: Light greyish to greyish-brown, starch grains numerous, simple or 2 to 4 compound, the individual grains spheroidal, plane-convex up to 16 µ diameter, the larger grains occasionally showing a central cleft, fragments of parenchyma the cells of which are filled with starch, relatively few fragments of slightly lignified cork tissue with cells being yellowish-brown walls, tracheae with slit like or bordered pores associated with fragments of sclerenchyma fibres that are long, thick-walled, fragments of medullary rays with cells having thick, lignified, porous walls and containing starch.

Habitat : Found from Southern New England, New York Westward to Minnesota and South of Florida.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 31; X, 372.

Part used : Bark of Root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Baptisia Tinctoria in *coarse powder*	100 g
Purified Water	333 ml
Strong Alcohol	700 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

BARYTA CARBONICA
(Bar. carb.)

Chemical symbol : $BaCO_3$ **Mol. wt.**: 197.349

Common names : Barii carbonas, Barium carbonicum, Carbonate of barium; *French*: Carbonate de baryte; *German*: Kohlensaures Barium.

Description : A white, heavy powder with no taste and odour; Poison! It is almost insoluble in water; readily decomposed by acids with the evolution of carbon di-oxide; soluble in dilute hydrochloric acid, nitric acid and acetic acid. Its specific gravity is 4.43. It occurs in nature as mineral witherite and is purified by precipitation. Contains not less than 98 percent of $BaCO_3$.

Identification : (i) Moisten with *hydrochloric acid*, heat on a platinum wire in Bunsen flame; it imparts a green colour to the flame.

(ii) Heat 1 g with 5 ml of *nitric acid*, cool, dilute with 3 times its volume of water and filter; the filtrate gives a precipitate with *sulphuric acid*.

Assay : Cover 4 g accurately weighed with 50 ml of water, run in 50 ml of 1 N *hydrochloric acid*, boil, cool and titrate excess of the acid with 1 N sodium hydroxide using bromophenol blue as indicator. Each ml of 1 N *hydrochloric acid* is equivalent to 0.09868 g $BaCO_3$.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 49; X 372.

Preparation : (a) Trituration 1x — Drug strength 1/10

Baryta carbonica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

Caution : Not to be prescribed below 3x.

BARYTA MURIATICA

(Bar. mur.)

Chemical symbol : $BaCl_2.2H_2O$ **Mol. wt.**: 244.277

Common names : Barii chloridum, Barium chloride; *French*: Chlorure de baryum; *German*: Chlorbaryum.

Description : A colourless, translucent crystals or granules or powder odourless; Poison! It is soluble in 5 parts of water and slightly soluble in alcohol. It loses its water of crystallisation at 120°. Its specific gravity is 3.1. It is commonly obtained from barium carbonate and hydrochloric acid. Contains not less than 99.0 percent and not more than the equivalent of 100.5 percent of $BaCl_2.2H_2O$.

Identification : It responds to the *reactions* characteristic of barium and of chlorides.

Loss on drying : Loses not less than 14.0 percent and not more than 16.0 percent of its weight, when dried to constant weight at 120°.

Nitrate : Dissolve 1 g in 10 ml of *water*, add 1 ml of solution of indigo caramine, 10 ml of nitrogen free *sulphuric acid* and heat to boiling. The blue colour does not entirely disappear.

Lead : Dissolve 1 g in 40 ml of recently boiled and cooled water, add 5 ml of *lead-free acetic acid*, render alkaline with *lead-free ammonia solution of sodium sulphide*. Not more than a slight colour is produced.

Assay : Dissolve about 0.5 g, accurately weighed, in 50 ml of *water* in a stoppered vessel, add 10 ml of *nitric acid*, 50 ml of 0.1 N *sliver nitrate* and 3 ml of *nitrobenzene* and shake vigorously for 1 minute. Titrate the excess of *silver nitrate* with 0.1 N *ammonium thiocyanate*, using *ferric ammonium sulphate* solution as indicator and shaking well between successive additions of titrant. Each ml of 0.1 N *silver nitrate* is equivalent to 0.01221 g of $BaCl_2.2H_2O$.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 65; X 373.

Preparation : (a) Trituration 1x — Drug strength 1/10

Baryta Muriatica in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

(c) Mother Solution — Drug strength 1/10

Baryta Muriatica — 100 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x to contain one part Solution, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol*.

Old method : Class Va (solution).

BELLADONNA
(Bell.)

Botanical name : *Atropa belladonna* Linn. **Family**: Solanaceae

Synonyms : *Atropa lethalis* Salisb, *Belladonna baccifera* Lam., *B. Trichotoma* Scop., *Solanum fluriosum, S. hortense* Scop.

Common names : *Hindi*: Sag-angur; *English*: Deadly night shade; *French*: Belladone; *German*: Tollkraut.

Description : A large, bushy, perennial herb with a thick, fleshy, juicy, branched and spreading root. The plant is 1 to 1.6 meter high, cylindrical, smooth. Leaves numerous, alternate below, opposite above, one larger than other short stalked, 7 to 23 cm long, ovate, entire and dark green. Flowers solitary (rarely 2 or 5 together), axillary, pedicillate, drooping, pedicel as long or longer than calyx 5 cleft, corolla bell-shaped, about 2.5 cm long, 5-lobed, dull reddish-purple, tinged with pale green. Fruit a berry.

Microscopical : Leaf: epidermal cells with more or less sinuous anticlinal walls and striated cuticle. Trichomes, more numerous on young leaves, simple uniseriate, conical trichomes, with smooth outer walls, shorter clavate, glandular trichomes with multicellular heads, long glandular hairs with uniseriate stalks and cellular heads; stomata, more numerous in the lower epidermis, of the cruciferous type. Lamina, palisade in single layer; occasionally cells of spongy parenchyma cells containing microsphenoidal crystals, palisade ratio 6 to 10. Mid-rib containing an arc of several collateral vascular bundles with upper supernumerary strands of phloem also with upper collenchyma.

Stem: an epidermis with striated cuticle and few hairs, distinct endodermis with a small strand of long, thin-walled, slightly lignified pericyclic fibres and a circle of bicollateral bundles. Parenchyma of cortex and pith interspersed with crystal cells.

Root: epidermis and cortex, usually lost, cork of 6 to 8 layers of brownish quadrangular cells; phelloderm of upto 5 layers of radially arranged parenchymatous cells; secondary phloem containing simple rounded or angular starch grains, forming a broad band containing of small bundles of sieve tissue embedded in abundant phloem parenchyma, the inner part radially arranged with numerous iodioblasts containing microsphenoidal crystals of calcium oxalate; cambiform tissue of about 5 to 8 layers of rectangular prismatic cells, secondary xylem forming the greater part of the root and consisting mainly of cellulosic xylem parenchyma, radially arranged with numerous scattered groups of about 3 to 10 vessels with associated pitted tracheids and fibrest vessels are bordered pitted; occasionally reticulate, sometimes sinuous, distinctly

articulated, the segments about 50 to 145 μ long; interxylary phloem, occasional, small scattered groups of sieve tubes; medullary rays 1 to 5 cells wide, cells near vessels sometimes thick-walled and pitted a central solid diarch strand of primary xylem.

Rootstock: periderm and phloem, similar to those of the root, sometimes with portions of parenchymatous cortex remaining externally and occasional pericyclic fibres; a broad, cream coloured or yellowish xylem showing secondary growth as alternating rings of parenchyma and lignified tissue containing scattered groups of vessels similar to those of root and much lignified xylem parenchyma with bordered pits; perimedullary phloem, with occasionally slender. Fibres singly or in groups of up to about 5; outer part of pith, parenchymatous with idioblasts containing microsphenoidal crystals of calcium oxalate, sometimes enclosing an internal periderm; inner part of pith, lacunar. Phloem fibers and stone cells absent. Epicarp of fruit, with polygonal epidermal cells having straight walls and cuticle striae; testa of seed, white to brown with undulated ridges over anticlinal walls. Odour, slight and characteristic; taste, sweetish, then slightly bitter.

Habitat : It is distributed in Central and Southern Europe. Cultivated in India (Kashmir).

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 67; X 373, 645.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Belladonna in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	470 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts of Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class I.

Revised Monograph Appeared in HPI Vol. IX

BELLIS PERENNIS
(Bel. per.)

Botanical name : *Bellis perennis* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: English daisy; *French*: La paquerette; *German*: Maslieben.

Description : A perennial herb, up 1 to 2 meter in height; leaves fleshy, forming a basal tuft, spathulate or obovate, 2.5 to 5.0 cm long, narrowed into margined petioles, slightly toothed, pubescent; midrib, broad. Heads solitary, 2.5 to 5 cm across on hairy peduncles; involucral bracts oblong, obtuse hairy; rays numerous, linear, white or rose, wholly or partly red and often incurved or relaxed or quilled. Root stock short, fibres stout.

Habitat : Britain, grown in floral gardens and often escaping to lawns.

History and authority : Mentioned in Homoeopathic literature in 1858 by Dr. Henry Thomas B. J. Hom. XVI 128; Allen's Encyclop. Mat. Med. Vol. II, 128.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Bellis Perennis in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	683 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I.

BERBERIS VULGARIS
(Berb. vul.)

Botanical name : *Berberis vulgaris* Linn. **Family**: Berberidaceae

Synonyms : *Berberis canadensis* Mill., *B. sinensis* DC, *B. serrulata* Raf.

Common names : *Hindi*: Kashmal; *English*: Pipperidge bush; *French*: Epine-vinette; *German*: Berberitzen.

Description : A deciduous shrub, having roots of pale yellow colour. The plant is 1 to 2.5 meter high and even higher under cultivation, with thorny alternate, angular branches. Leaves in tufts, somewhat obovate, more or less pointed, serrated and fringed, with 3-cleft spreading, sharp thorns at base of each leaf bud. Flowers in drooping, many-flower racemes, golden yellow with red glands. Fruit a berry, oblong in loose bunches.

Macroscopical : Bark of the root is yellowish, externally with sometimes orange shade.

Microscopical : Root: transverse section of young root shows, epidermal cells with a thick cuticle, varying in size and showing no hair growth. Cortex consists of 4 to 6 layers of cellulose-walled cells, irregular in shape. Few isolated or small groups of roundish lignified cells are present. Pericycle is of 2 distinct zones of sclerenchymatous and parenchymatous origin. The phellogen develops from cellulose parenchyma. The crescent of fibres behind each phloem is about 3 cells wide in central part. In old roots, cork cells are tabular and lignified. Pericycle represented by inner lacunous walls, with large air gaps. Fibres of 2 types, containing sclerenchymatous sheath and semilunar groups behind primary phloem bundles present. Prismatic crystals of calcium oxalate present.

Habitat : India, Europe and North of Asia.

History and authority : Introduced into homoeopathic practice in 1835 by Dr. Hesse, Bib. Hom. de Gen. V, 46; Allen's Encyclop. Mat. Med. Vol. II, 139.

Part used : Bark of the root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Berberis Vulgaris in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one parts tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x with *dilute alcohol.* 4x and higher with *Dispensing Alcohol.*

Old method : Class III.

BLATTA ORIENTALIS
(Blat.)

Zoological Name : *Blatta orientalis* Linn. **Family**: Orthoptera

Common names : *Hindi*: Tail-chatta; *English*: Cockroach.

Description : Blatta orientalis is a common cockroach in India, where it in-habits human dwelling and damp moist corners. It is an orthopterous insect, with an elongated oval, rather flat body, from 12 to 16 lines in length, of a red or brown-red colour, which becomes paler under belly. The prothorax is smooth, shining, with 2 large brown spots. In the male, the elytra reach beyond the belly by a few lines. In the female, they are little shorter. The wings are striate and reticular, of the length of elytra. The antennae, which are longer than the body, exhibit at their base a small yellowish point. The feet are provided with black prickles and terminate in the tarsus, with 5 articulations. In *Blatta orientalis*, the dorso-plunal line of the abdomen is contained in the narrow, unfolded lateral membrane uniting the paratargites and the larger ventral plates. In the male cockroach, the ventral plate of the ninth segment bears a pair of the style. Genital segments of the female almost entirely concealed within seventh segment.

History and authority : Ray Hom. Recorder 1890, page 254, 1891, page 193. A dictionary of Pract. Mat. Med. Clarke. Vol. I, 290.

Part used : Whole insect.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Blatta Orientalis 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IX.

Revised Monograph Appeared in HPI Vol. X

BOERHAAVIA DIFFUSA

(Boer. dif.)

Botanical name : *Boerhaavia diffusa* Linn. **Family**: Nyctaginaceae

Common names : *Hindi*: Punarnava, Sant.

Description : A diffusely branched herb, root stout, fusiform, root stock woody. Stem up to 1 meter long, slender, prostrate or ascending, swollen at the nodes, mostly hairy and sometimes viscid or sub-glabrous, often tinged with purple; leaves rather thick, arranged in unequal pair at each node, 1 to 4 cm long, ovate-oblong or sub-orbicular, green and glabrous above, usually white beneath, base rounded or sub-cordate, margins subundulate, often pink; petiole as long as the blade. Flowers minute, pink or red, sub-capitate, 4 to 10 together in small bracteolate, umbels, forming slender, long stalked axillary and terminal panicles; bracteoles lanceolate, acute. Perianth 3 mm long, clavate, rounded viscidly glandular on the 5 broad blunt ribs.

Microscopical : Stem: epidermal layer contains multicellular uniseriate, glandular trichomes consisting of 8 to 12 stalked cells and an ellipsoidal head, 150 to 200 µ long; cortex consisting of 1 to 2 layers of collenchymas or more in corners and a few layers of parenchyma; endodermis indistinct; pericycle 1 to 2 layered, thick walled often containing scattered isolated fibres; stele, many small vascular bundles are scattered in the ground tissue; intrafacicular cambium present. Leaves, stomata on sides, numerous, few short hairs, 3 to 4 celled, present on the margin and on veins, palisade, one layered, spongy parenchyma 2 to 4 layers with small air spaces, idioblasts containing raphides, orange-red resinuous matter and occasionally cluster crystals in mesophyll. Palisade ratio 3.5 to 6.5, stomatal index 11 to 16.

Habitat : A common weed throughout the plains in India.

History and authority : Drugs of Hindoosthan: Ghose.

Part used : Entire fresh herb with flowers or dried powder of the whole plant with flowers.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Boerhaavia Diffusa, moist magma containing solids 100 g and plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x with *dilute alcohol*. 3x and higher with *Dispensing Alcohol*.

BORAX
(Borax)

Chemical symbol : $Na_2B_4O_7.10H_2O$ **Mol. wt.**: 381.373

Common names : Sodii boras, Natrum boracicum, Borate of Sodium, Sodic pyro borate; *French*: Borate de soude; *German*: Natrium Pyroborat.

Description : A colourless, odourless, transparent crystals or a white, crystalline powder; taste sweetish and alkaline; effloresces in warm, dry air; loses its water of crystallisation on heating. It is soluble in 16 parts of water and in 1 part of boiling water; insoluble in alcohol. Its specific gravity is 1.694. It is mainly prepared from *borax* minerals and also found native. Contains not less than 99 percent and not more than 103 percent of $Na_2B_4O_7.10H_2O$.

Identification : (i) An acidulated aqueous solution of borax in *water* gives a reddish-brown colour to *turmeric paper;* colour is intensified on drying; dried paper when moistened with *ammonia solution*, the colour changes to greenish-black.

(ii) It responds to all the characteristic *tests* of sodium.

(iii) The mixture obtained by the addition of sluphric acid and alcohol (95 percent) when ignited, burns with a green bordered flame.

Arsenic : Not more than 10 parts per million.

Chloride : 1 g complies with the *limit test* for *chlorides.*

Iron : 0.5 g complies with the *limit test* for *iron.*

Sulphate : 1 g complies with the *limit test* for *sulphate.*

Carbonate or free boric acid : The difference between the volumes of 0.5 N *hydrochloric acid* and 1 N *sodium hydroxide* used in the '*assay*' does not exceed 0.1 ml.

Assay : Weigh accurately about 3 g and dissolve in 75 ml of water and titrate with 0.5 N *hydrochloric acid*, using solution of *methyl red* solution as indicator; record the volume of 0.5 N *hydrochloric acid* required. Boil and cool the solution, add 20 g of *mannitol* and titrate with 1 N *sodium hydroxide* using *phenolphthalein* solution as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.09534 g of $Na_2B_4O_7.10H_2O$.

Storage : Borax should be kept in a well-closed container.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 195.

Preparation : (a) Trituration 1x — Drug strength 1/10

Borax in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

BOVISTA
(Bovist.)

Botanical name : *Lycoperdon bovista* Pers **Family**: Lycoperdaceae

Synonyms : *Bovista lycoperdon* Sowerby 1803, *B. nigrescens* Pers., *B. officinalis.*

Common names : *English*: Warted Puff ball; *French*: Vesse-loup; *German*: Bovist.

Description : The fungus is as round as a ball; it is at the base narrowed to form a thick, folded stalk. It is of variable in size, upto 30 cm; when young, it is white, later of a dirty yellow colour, finally changing to umber brown (Black).

Microscopical : The periderm in the unripe condition covers and mass of soft cellular tissue. Upon ripening, is mass divided into many branched compartments that are separated from each other by walls made up of branched hyphae. These walls are lined with a hymenium composed of many basidia, each of which constrict of usually four basidiospores. Grows mostly over rotten log of wood.

Habitat : Most parts of Europe and Asia Minor in pasture land and dry meadows.

History and authority : Allen's Encyclop. Mat. Med.Vol. II, 212.

Part used : Ripe Bovista (Fungus).

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Bovista in moderately *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration: 1x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x .9x and higher with *Dispensing Alcohol*

Old method : Class IV.

Revised Monograph Appeared in HPI Vol. IX

BRYONIA ALBA
(Bry. alba)

Botanical name : *Bryonia alba* Linn. **Family**: Cucurbitaceae

Synonyms : *Bryonia vera, Uva angina, U. serpentine, Vitis alba, V. nigra.*

Common names : *English*: Black-berried bryony; *French*: Couleuvree; *German*: Zaunrube.

Description : A perennial, climbing, herbaceous vine with a fusiform, branched root. Leaves alternate, cordate, five-lobed, rough, bright green in colour. Flowers small, greenish-yellow, monoecious; in axillary racemes; the male flowers being on long peduncles and the female flowers are larger than the male. Berries, globular, black and about 6 mm in diameter.

Macroscopical : The drug root is in the form of circular or elliptical slice from 1.5 to 10 cm in diameter and up to 15 mm in thickness, the edges light grey or yellowish, rough and striate, the cut surface light yellowish-orange to moderate, showing a thin bark and broad wood, the latter exhibiting a thin cortex and several concentric zones of collateral fibro-vascular bundles; fracture short and mealy; whitish internally.

Microscopical : Powdered: light yellowish-orange to light yellow, fragments of parenchyma, numerous starch grains, both simple and 2 to 6 compounds, the individual grains spheroidal, plano-convex and polygonal, usually with a central hilum, from 4 to 254 µ width, reticulate or with bordered pores markings, large yellow cork fragments.

Habitat : Middle and South of Europe.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 249.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Bryonia Alba in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x with *dilute alcohol*. 4x and higher with *Dispensing Alcohol*.

Old method : Class I.

BUFO RANA
(Bufo. ran.)

Zoological Name : *Bufo vulgaris* Lacepede, 1788 **Family**: Bufonidae

Common names : *English*: Cinereus, Bufo Rana, Common Toad.

Description : The live animal is fastened to a slab of cork by 4 strong pins stuck through webs of feet. Poles of an induction apparatus in action are slowly drawn over the back of the animal, where upon the poison very soon issues from the dorsal glands. This is removed with small horn knife and triturated.

Habitat : This well-known animal is a native of North America, Europe, Southern Asia and Japan.

Part used : Poisonous venom from the dorsal glands.

History and authority : Proved by Carl Hencke of Germany. Allen's Encyclop. Mat. Med. Vol. II, 303.

Preparation : (a) Trituration 3x Drug strength 1/100

Bufo Rana dry venom	1 g
Saccharum Lactis	999 g

to make one thousand grammes of the trituration.

(b) Potencies: 4x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x.9x and higher with *Dispensing Alcohol*.

Old method : Class VIII.

Caution : Not to be prescribed below 4x.

Revised Monograph Appeared in HPI Vol. X

CACTUS GRANDIFLORUS
(Cact. grn.)

Botanical name : *Cereus grandiflorus* Mill. **Family**: Cactaceae

Common names : *English*: Night blooming cereus; *French*: Ciege a' qrandes fleurs; *German*: Konigin der Nacht.

Description : An evergreen under-shrub, with a creeping root. The green branching stem is succulent and armed with clusters of 5 or 6 short radiating spines or bristles. Flower large, sweet scented, white and is about 30 cm in diameter, opening only once that is in evening and closing again before morning.

Macroscopical : Cactus stem occurs in the segments of variable length from 1.5 to 4 cm in diameter and with 5 to 6 angles or ribs, the later intervals of about 2 cm, showing tufts of 9 to 12 acicular spines of about 5 mm in length.

Microscopical : Transverse section of stem 5 to 9 angled in outline. Epidermis of cutinised and papillose cells, a narrow type dermis of 3 to 4 rows of collenchymas tissue, a narrow circle of small, open collateral fibro-vascular bundles with bast fibres in the outer portion of the phloem, the bundles separated by medullary rays and a narrow central pith; mucilage sacs and crystals cells scattered throughout the cortex, pith and medullary rays.

Habitat : Generally hot and stony places of tropical America.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 321.

Part used : Flowering stem. Moisture content of fresh stem, 566 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cactus Grandiflorus in moderately *coarse powder*	50 g
Purified Water	283 ml
Strong Alcohol	754 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

CALCAREA ARSENICOSA

(Cal. ars.)

Chemical symbol : $Ca_3(ASO_3)_2$ **Mol. wt.**: 336.08

Common names : Calcium arsenicosum, Calcium arsenite.

Description : A white, granular powder, slightly soluble in *water*; soluble in acids. Poison!

Identification : It responds to all the *tests* characteristic of *calcium* and of arsenites.

Assay : Weigh accurately about 0.2 g and dissolve in a mixture of 50 ml of *water* and 2 ml of *hydrochloric acid*. Add 25 ml of *dilute ammonium acetate* solution and slight excess of solution of *ammonium oxalate*. Heat for 1 hour on a water bath, filter, wash the residue with warm water, suspend in 50 ml of water, acidify to *litmus paper* with dilute *sulphuric* acid. Heat to 70° and titrate with 0.1 N *potassium permanganate* keeping the solution at 70° during the entire titration. Each ml of *potassium permanganate* is equivalent to 0.0061 g of $Ca_3(ASO_3)_2$.

History and authority : Dr. Hering first prepared this and proved in 1948. A Dictionay. of Pract. Mat. Med. Clarke Vol. I, 335.

Preparation : (a) Trituration 1C — Drug strength 1/100

Calcarea Arsenicosa	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be Triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

Caution : Not to be prescribed below 3x.

CALCAREA CARBONICA

(Calcium Carbonate of Hahnemann)
(Cal. carb.)

Chemcical Symbol : $CaCO_3$ **Mol. wt.**: 100.08

Common names : Calcarea ostrearum, Ostrea edulis, Oyster shells, Carbonate of lime; *French*: Carbonate de chaux; *German*: Calciumkarbonat.

Description : The substance used by Hahnemann was an impure carbonate of limes as it exists in the oyster shell. Take well selected, tolerably thick oyster shells, clean and break into small pieces. The pure middle layer is selected, washed carefully with purified water, dried over a water bath and reduced to a fine powder using non-metallic instruments. It is fine white, micro-crystalline powder; odourless, tasteless. Almost insoluble in water; slightly soluble in water containing carbon di-oxide. This may also be obtained by the process of precipitation. The precipitated calcium carbonate contains not less than 98.5 percent of $CaCO_3$, calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) It responds to the *reactions* characteristic of *calcium* and of *carbonates*.

(ii) Loses not more than 1.0 percent of its weight when dried to constant weight at 105°.

Assay (for calcium carbonate precipitated) : Weight accurately about 1 g and transfer to a 250 ml beaker. Moisten with a few ml of *water* and add drop wise sufficient dilute *hydrochloric acid* to effect complete solution. Transfer the solution to a 250 ml flask; add *water* to make the volume and mix. Pipette 50 ml of the solution in a suitable container, add 100 ml *water* and 15 ml of solution of *sodium hydroxide*, 40 mg of *muroxide* indicator preparation, 3 ml of solution of *napthol green* and titrate with 0.05 M *disodium ethylene diamine tetra-acetate* until the solution deep blue in colour. Each ml of 0.05 M *disodium ethylene diamine tetra-acetate* is equivalent to 0.005005 g $CaCO_3$.

Storage : Preserve Calcium carbonate in well-closed container.

History and authority : Hahnemann prepared and proved this salt of Calcium. Allen's Encyclop. Mat. Med. Vol. II, 351.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Carbenica precipitate	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

CALCAREA FLUORICA

(Cal. fl.)

Chemical symbol : CaF_2 **Mol. wt.**: 78.067

Common names : Calcii fluorica, Calcium fluoride, Fluor spar, Fluorite; *German*: Fluorcalcium.

Description : A white or whitish-grey powder; odourless and tasteless; becomes luminous when heated. It is practically insoluble in water, slightly soluble in very dilute acids; soluble in concentrated mineral acids. It occurs in nature in large deposits. Contains not less than 99.0 percent of CaF_2.

Identification : It melts at a low red heat and after fusion assumes the appearance of a glassy substance.

Assay : Weigh accurately about 0.2 g of the substance in a *platinum* crucible, add about 1 g of *sodium bicarbonate, sodium nitrate* and heat for an hour. Cool, dissolve the residue in 50 ml of *water* and 2 ml of *hydrochloric acid*. Add 25 ml of *dilute ammonium acetate* solution and a slight excess of solution of *ammonium oxalate*, complete the assay as under *'calcium arsenite'*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.0039 g of CaF_2.

History and authority : Dr. Schussler made use of this salt of calcium first. Allen's Encyclop. Mat. Med. Vol. X, 398.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcaria Fluorica in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol*.

CALCAREA PHOSPHORICA

(Cal. phos.)

Chemical symbol : $Ca_3(PO_4)_2$ **Mol. wt.**: 310.183

Common names : Galcii phosphas precipitatus, calcium phosphoricum, Precipitated phosphate of calcium, Tribasic calcium phosphate; *French*: Phosphated chaux hydrate; *German*: Calciumphosphat.

Description : A white, amorphous or micro-crystalline powder; odourless and tasteless. It is stable in air. It is almost insoluble in water and is decomposed slightly by boiling *water*; insoluble in alcohol. It is readily soluble in dilute nitric acid or hydrochloric acid. Its specific gravity is 3.14. It is commonly obtained by purifying bone-ash or by the interaction of *calcium chloride* and secondary *sodium phosphate* in the presence of ammonia water. Contains not less than the equivalent of 85.0 percent of $Ca_3(PO_4)_2$.

Identification : (i) A solution in *nitric acid* responds to the *test* of phosphates.

(ii) A solution in dilute *hydrochloric acid* responds to the *tests* of calcium.

(iii) It gives a characteristic flame *test* for calcium.

Arsenic : Not more than 5 parts per million.

Chloride : Dissolve 0.1 g in *water* by addition of 1 ml of *nitric acid*; the solution complies with the *limit* test *for chlorides.*

Lead : Not more than 20 parts per million.

Sulphate : Dissolve 0.15 g in *water* by the addition of 1 ml of *hydrochloric acid*; the solution complies with the *limit test for sulphates.*

Assay : Weigh accurately about 0.2 g and dissolve in a mixture of 50 ml of *water* and 2 ml of *hydrochloric acid*. Add 25 ml of dilute *ammonium acetate* solution and a slight excess of solution of *ammonium oxalate*. Heat for 1 hour on a water bath and filter, wash the residue with warm *water*, suspend in 50 ml. of *water*, acidify to *litmus paper* with *dilute sulphuric acid*. Heat to 70° and titrate with 0.1 N *potassium permanganate* solutions, keeping the solution at 70° during the entire titration. Each ml of 0.1 N of *potassium permanganate* equivalent to 0.00517 g of $Ca_3(PO_4)_2$.

Storage : Preserve in a well-closed container.

History and authority : Proved and tested clinically; adopted by Dr. Schussler as a chief antipsoric drug. Allen's Encyclop. Mat. Med. Vol. II, 394.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Phosphorica in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

CALCAREA SULPHURICA

(Cal. sul.)

Chemical symbol : $CaSO_4.2H_2O$ **Mol. wt.**: 172.172

Common names : Calcii sulphas, Sulphate of Calcium, Gypsum; *French*: Sulfate de chaux; *German*: Calciumsulfat.

Description : A fine, white to slightly yellowish-white powder; odourless and tasteless. It is soluble in 375 parts of cold water or 485 parts of boiling water. Its solubility in water is increased by acids, ammonium chloride and rising temperature. It is insoluble in alcohol, ether and chloroform. When exposed to air, it becomes granular and loses the property of solidifying, when mixed with water. It occurs naturally as gypsum and is also prepared by adding a soluble sulphate to a solution of calcium salt. Contains not less than 99 percent of $CaSO_4.2H_2O$.

Identification : (i) With a solution of *ammonium oxalate*, a white precipitate ia formed, which is insoluble in *acetic acid* and is soluble in *dilute hydrochloric acid.*

(ii) With a solution of *barium chloride*, it gives a white precipitate, insoluble in acids.

Residue on ignition : When ignited leaves not less than 78.5 percent and not more than 80 percent of residue.

Assay : Weigh accurately about 0.2 g and proceed as described under '*Calcarea arsenicosa*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.004305 g of $CaSO_4.2H_2O$.

History and authority : The drug was proved by Dr. Clarence Conant, U.S. Allen's Encyclop. Mat. Med. Vol. II, 410.

Preparation : (a) Trituration 1x Drug strength 1/10

Calcarea Sulphurica in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

CALENDULA OFFICINALIS
(Calend.)

Botanical name : *Calendula officinalis* Linn. **Family**: Compositae (Asteraceae)

Common names : *Hindi*: Zerzul; *English*: Garden Marigold; *French*: Fleur de tous les mois; *German*: Rinjelblume.

Description : A more or less hairy, annual 30 to 60 cm high; leaves thickness, oblong to oblong-obovate, 5 to 15 cm or more long, entire or minutely and veinately denticulate, more or less clasping. Heads solitary on stout stalks, showy, 4 to 5 or 10 cm across, the flat spreading rays white yellow to deep orange; closing at night. Sometimes the plant is proliferous from the involucre bearing several peduncled head in a circle. Involucre broad usually scarious margined, bracts in 1 or 2 rows, receptacle naked; ray-achenes glabrous, incurved, disk flowers sterile, pappus none.

Microscopical : Fragments of corolla, mounted in water or chloral hydrate and in the transverse section, exhibits elongated epidermal cells with striated cuticle, the parenchyma cells beneath showing numerous often yellow, oil globules and irregular chromo-plastids, on the vicinity of the tube will be noted a few long non-glandular hairs, consisting of a double row of thin walled, more or less collapsed cells with a 1 or 2 celled summit and upto about 950 µ in length coursing through the mesophyll will be noted, strands of fibro-vascular tissue, each possessing an annular and spiral trachea. Spinose pollen grains, 3 pored and upto 45 µ in diameter will be noted adhering to the corolla.

Habitat : It is cultivated in India.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 419.

Parts used : Fresh flowering tops and leaves. Moisture content of fresh flowering tops and leaves is 600 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Calendula Officinalis, moist magma containing Solids 100g and plant moisture 600 ml	700 g
Strong Alcohol	437 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water, five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I.

Revised Monograph Appeared in HPI Vol. X

CALOTROPIS GIGANTIA

(Calot. gig.)

Botanical name : *Calotropis gigantea* R. Br. **Family**: Asclepiadaceae

Common names : *Hindi*: Ak, Ark. Mudar; *French*: Ecorce de racine de mudar; *German*: Mudarwurzelrinde.

Description : A large shrub, up to 3 meter high or occasionally subarboraceous with ash coloured, wrinkled bark; younger parts and under surface of leaves covered, with appressed white floccose tomentum. Leaf sub-sessile, thick, glaucous green, 10 to 20 cm long, elliptic or obovate-oblong or shortly acuminate, with a narrow cordate or often amplexicaul base. Flowers 4 to 5 cm in diameter, arranged in umbellate cymes, not scented, buds ovoid, sepals purplish or white, lobes 1.25 cm or more, spreading deltoid, sub-acute. Corona lobes upto 1 cm long hairy, shorter than the column, curved on the back, above the involute obtuse spur, apex rounded; follicles 7 to 10 cm long, recurved, turgid, smooth. Seed 6 mm long, broadly ovate, flat and minutely tomentose with a silky coma.

Macroscopical : The roots are woody but light, greyish white or greyish-yellow cylindrical and often curved, with the surface, considerably fissured longitudinally. Rind or “outer bark” appreciably thick, corky, soft and easily friable; in the fresh condition the officinal part of the bark is bulky, starchy white, has a fairly homogenous structure and exudes plenty of latex. In dried roots it is thinner, greyish and somewhat friable.

Microscopical : The cork zone is deeply and widely fissured and composed of several rows of small cubical or rectangular regularly arranged thin walled cells. The cortex is comparatively narrow and compressed, of a few rows of thin walled cells, loaded with starch grains. Latex tubes occur in the cortex and bast. Wood consists mostly of xylem parenchyma, regular radial rows of vessels and several medullary rays. The medullary rays are straight and mostly uniseriate or very occasionally bi-serriate. The cells in the phloem part are thin-walled and in the xylem thick walled. All the cells are loaded with starch grains. There is no pith in the center.

Habitat : Common throughout India.

History and authority : It was introduced into Homoeopathic practice by E.B. Ivatts in 1878-Hom. World XIII 15. Allen’s Encyclop. Mat. Med. Vol. X, 651.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Calotropis Gigantia, moist magma containing solid 100g and plant moisture 285ml	385 g
Strong Alcohol	740 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x with *dilute alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class IV.

CAMPHORA
(Camph.)

Chemical symbol : $C_{10}H_{16}O$ **Mol. wt.** 152.238

Common names : Camphor officinarum; *French*: Camphre; *German*: Kampfar.

Description : A colourless or white crystalline powder, granules or crystalline masses; or pressed blocks of crystalline structure, easily cut with a knife. It has a strong characteristic odour and pungent, bitter taste followed by a cooling sensation. It is readily pulverisable in the presence of a little alcohol, ether or chloroform. It is insoluble in about 840 parts of water, 1 part of alcohol and 1 part of ether. Its specific gravity is about 0.99. It melts between 174° and 179°, slowly volatilises at ordinary temperature. It is a ketone, obtained from *Cinnamomum camphora* Linn. or from *Ocimum canum* Sims. It is purified by sublimation. Contains not less than 96.0 percent of $C_{10}H_{16}O$.

Identification : (i) A solution of 1 g of the preparation in 4 ml of *alcohol* is clear and colourless.

(ii) It burns with a bright smoky flame.

Non-volatile matter : When volatilised at 105°, leaves not more than 0.05 percent of residue.

Assay : Dissolve about 0.2 g, accurately weighed, in 25 ml of aldehyde-free alcohol in a 300 ml flask. Slowly add with constant shaking, 75 ml of *dinitrophenyl hydrazine solution.* Heat on a water bath under a reflux condenser for 4 hours. Remove the alcohol by distillation, allow to cool, dilute to 200 ml with a 2 percent v/v solution of *sulphuric acid* in *water* and allow to stand for 24 hours. Filter in a tared Gooch crucible and wash the precipitate with successive quantities, each of 10 ml of cold *water* until the washings are neutral to litmus solution. Dry to constant weight at 80° and weigh. Each gram of precipitate is equivalent to 0.458 g of $C_{10}H_{16}O$.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 422.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Camphora 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration: 1x and higher to be triturated in accordance with the method 6x may be converted to liquid 8x. 9x and higher with *Dispensing Alcohol.*

Rubin's camphor : Saturated solution of camphor in Strong Alcohol (Saturated Tincture) Drug strength 1/2.

Old method : Class VI a.

Storage : Mother Tincture and potencies be kept in well closed container in a cool place.

Revised Monograph Appeared in HPI Vol. X

CANNABIS INDICA
(Can. ind.)

Botanical name : *Cannabis sativa* Linn. **Family**: Cannabinaceae

Synonym : *Cannabis indica* Lamk.

Description : Strong smelling, stout, erect, annual herb, branched or nearly simple, 1 to 3.5 meter. Leaves alternate, thin, long petioled; the blade digitate with 3 to 7 long lanceolate or linear-lanceolate, long acuminate leaflets.

Microscopical : Leaves and bracts dorsiventral. Upper epidermis bears unicellular, pointed, conical, curved trichomes with enlarged bases containing cistoliths of calcium carbonate. Mesophyll contains cluster crystals of calcium oxalate in many cells and consists of usually one layer of palisade cells and spongy tissue. Trichomes on the lower epidermis conical, longer but without cystoliths. Numerous glandular trichomes, sessile or with a multicellular stalk and secreting head of about eight radiating club shaped cells, secreting oleoresin present in the lower epidermis especially on mid-rib.

Habitat : Considered a native Western Central Asia but practically naturalised in the Sub-Himalayan tract in India and is abundantly met with waste lands from Punjab eastwards to Bengal, Bihar and extending southwards to Deccan; cultivated.

History and authority : Introduced into Homoeopathic Practice in 1841 by Dr. Trinks, Allg. Hom. Zeit. XX 268. Allen's Encyclop. Mat. Med. Vol. II, 448; X 409.

Part used : Leaves.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cannabis Indica, moist magma containing solids 100g and plant moisture 180 ml	280 g
Strong Alcohol	850 ml

to make one thousand milliltres of the Mother tincture.

(b) Potencies: 2x with *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

CANNABIS SATIVA
(Can. sat.)

Botanical name : *Cannabis sativa* Linn. **Family**: Cannabinaceae

Common names : *English*: Hemp, Gallow grass; *Hindi*: Ganja; *French*: Chanvre; *German*: Hanf.

Description : Strong smelling, stout, erect, annual herb, branched or nearly simple, 1 to 3.5 meter in height. Leaves alternate, thin, long petioled; blade digitate with 3 to 7 long lanceolate or linear-lanceolate, large toothed, long acuminate leaflets.

Macroscopical : Flattened, cylindrical, rough, dull, dusky green masses consisting of branched upper part of stem, bearing bracts, bracteoles, pistillate flowers or fruits matted together by resinous secretion. Stem thin, straight, cylindrical, longitudinally furrowed; bracts 1.5 to 2 cm long, simple or lobed with 2 small subulate, stipulate stipules; bracteoles in pairs in the axil of bract, boat shaped with acute apices, incurred at the base to enclose the flower or fruit, flowers formed in the axil of each bracteoles and each consists of an ovary enclosed by hairy membranous perianth; ovary 2 mm long, surmounted by 2 long brownish-red hairy stigmas. Fruits achenes, few, 5 to 6 mm long, 4 mm wide, ovoid, glossy green or yellowish-green single seeded.

Microscopical : Leaves and bract dorsiventral. Upper epidermis bears unicellular, pointed conical, curved trichomes with enlarged bases containing cystoliths of calcium carbonate. Mesophyll contains cluster crystals of calcium oxalate in many cells and consists of usually one layer of palisade cells and spongy tissue. Trichomes on the lower epidermis conical, longer but without cystoliths. Numerous glandular trichomes, sessile or with a multicellular stalk and a secreting head of about eight radiating club-shaped cells, secreting oleo-resin present in lower epidermis, especially on mid-rib. Bracteoles have undifferentiated mesophyll and bear on lower surface numerous glandular trichomes. Stem has well developed bundles of pericyclic fibres; phloem contains large unbranched laticiferous tubes, cluster crystals of calcium oxalate present in both cortex and pith.

Habitat : Considered a native of Western Central Asia but practically naturalised in the Sub-Himalayan tract in India and abundantly met cultivated from Punjab eastwards to Bengal, Bihar and extending southwards to Deccan.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 492.

Part used : Flowering tops of both male and female.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cannabis Sativa, moist magma containing solids 100 g and plant moisture 200 ml	300 g
Purified Water	100 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III, class I.

Revised Monograph Appeared in HPI Vol. X

CANTHARIS
(Canthr.)

Zoological Name : *Lytta vesicatoria* Febricus **Family**: Cantharidae

Synonyms : *Cantharis vesicatoria* De Geer, Fabricius, *Meloe vesicatorius* Linn.

Common name : Spanish fly.

Description : This fly of the middle and south of Europe, appears in the month of May and June, especially on the white popular, privet, ash elder, lilac, etc., upon the leaves of which they feed. The insect is about half an inch long, of a golden yellow-green; head inclined, almost cordiform; antennane filiform, of twelve joints, black; antennules equally filiform, the posterior swollen at the extremity; ice large, of a deep brown; mouth with an upper lip and two bi-fid jaws; body elongated, almost round and cylindrical; two wings; elytrae soft, semi-cylindrical, marked with longitudinal streaks; head and feet full whitish hairs; the order is sweetish, nauseous; taste very acrid, almost caustic. The larvae of these insects have yellowish-white bodies formed of three rings, six short feet, rounded head, two short filiform antennae, two jaws and four feelers; they live in the ground, feed on roots, undergo their metamorphosis and do not come out till they are perfect insect. In May and June when the insects swarm upon the trees, they are collected in the morning at sunrise, when they are torpid from the cold of the night and easily let go their hold. Persons with their faces protected by masks and their hand with gloves shake the trees or beat them with poles; the insects are received as they fall, upon linen close spread underneath. They are then exposed in sives to the vapour of boiling vinegar and having bean thus deprived of life, are dried either in the sun or in apartments heated by stoves. The larger flies are much better for medical use than the smaller ones.

Habitat : It is Spanish fly and is found in middle and South of Europe, South western Asia. It feeds on ash and other trees.

History and authority : It was introduced in Homoeopathy by Hahnemann. Allen's Encyclop. Mat. Med. Vol. II, 505.

Part used : Whole dried fly.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cantharis in fine powder	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV.

CARBO ANIMALIS
(Carbo. an.)

Common names : *English*: Leather charcoal; *French*: Charbon animal; *German*: Knocken-khole.

Description : It occurs as an odourless, tasteless powder. Crude animal charcoal is the material prepared by heating bones with a limited access of air and consists chiefly of calcium phosphate and other inorganic constituents of bone with about one-tenth of its weight of carbon; occurs in dull black, granular fragments or as a dull black, odourless powder. It may be prepared by following process: place a thick piece of Ox-hide on red hot coal, leave it there so long as it turns with a flame. As soon as flame ceases, lift off red hot mass and press it between two flat stones. Boil it with *hydrochloric acid*, washing thoroughly drying and re-heating. It may yield as much as 10 percent of ash.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 549.

Preparation : (a) Trituration 1x — Drug strength 1/10

Carbo Animalis in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

CARBO VEGETABILIS
(Carbo. veg.)

Common names : *English*: Carboligni, Wood charcoal, Vegetable charcoal; *French*: Charbon vegetal; *German*: Holzkohle.

Description : A bluish-black, porous substance, having a peculiar glistening aspect and retaining minutely both the form and texture of the wood from which it was made. It is odourless and tasteless; insoluble and infusible. Its specific gravity 1.7. It is commonly prepared from selected birch or beach wood by heating at high temperature. The product is washed free from mineral matter and dried. Charcoal has the property of absorbing gases and condensing them within its porous mass. It is denser when obtained by pile-burning than, when prepared in retorts; on continued exposure to gases, it becomes saturated with them but its absorbing powers are restored by heating it to redness out of contact with air.

Identification : (i) When heated in air it converted into *carbon di-oxide*.

(ii) When burnt, it should give no smoke or unpleasant odour.

(iii) Absence of flame shows freedom from organic compounds.

Ash : Not more than 10.0 percent,

Storage : Preserve in well-closed containers.

History and authority : It was proved by Hahnemann. Allen's Encyclop. Mat. Med. Vol. II, 565.

Preparation : (a) Trituration 1x — Drug strength 1/10

Carbo Vegetabilis in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. IX

CARDUUS MARIANUS
(Card. mar.)

Botanical name : *Silybum marianum* Gaertn. **Family**: Compositae (Asteraceae)

Synonym : *Carduus marianus* Linn.

Common names : *Hindi*: Badaward; *English*: Blessed thistle; *French*: Chardon Marie; *German*: Frauendistel.

Description : An erect, thistle-like herb, 1/3 to 1.3 meter high, biennial, deciduous and glabrous. Leaves clasping with spines, toothed lobes, conspicuously white, dotted above, 30 to 75 cm long and 15 to 30 cm across, undulate; heads 4 to 7 cm across, solitary, terminal, nodding; involucre broadly sub-globose, involucral bracts leathery, with a spine 1 to 2 cm long or the outer mucronate; flowers rose purple, all bisexual, corolla tube slender, the limb 5-cleft to middle or base; achens glabrous, 6 mm long, spotted brown; pappus shining white.

Habitat : Punjab, Northwest Himalayas, Jammu and Kashmir, southern Europe and Great Britain.

History and authority : Allen's Encyclop. Mat. Med. Vol. II, 635.

Part used : Seeds. Moisture content in fresh seeds 230 ml. per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Carduus Marianus in moderately *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

CAULOPHYLLUM THALICTROIDES
(Caulph.)

Botanical name : *Caulophyllum thalictroides* Michx **Family**: Berberidaceae

Synonym : *Leontice thalictroides* Linn.

Common names : *English*: Blue cohosh, pappoose root; *French*: Laleontice; *German*: Loewenblatt.

Description : A perennial herb with thickened rootstock, stem up to 1 meter in height, with a large triternate, almost sessile leaf near the summit and smaller usually biternate leaf near the base of the panicle: leaflets oval to obovate, 3 to 5 lobed, 2.5 to 10 cm long. Flowers in terminal panicles, yellow-green, 1.25 cm across; sepals, petals and stamens 6; pistil 1 with short style and unilateral stigma; petals forming head and smaller than sepals; seeds 8 mm thick, blue-black.

Macroscopical : Rhizome branched crooked of horizontal growth, 7 to 25 cm long and 5 to 15 mm thick, showing on its upper surface broad cup-shaped stem scars short bases of stems, on all surfaces tough and wiry rootles matted together, dusty brown to light yellowish brown fracture tough and woody, internally light brown to yellowish brown with a waxy luster; bark thin, wood with numerous small wood wedges separated by narrow medullary rays and enclosing a broad pith.

Microscopical : Powder: pale brown to light yellowish orange. It shows fragment of yellowish brown cork, tracheids with bordered pores (pits), upto 50 µ in diameter, fragments of wood fibres and tracheids with bordered pores; fragments of starchy parenchyma and numerous more or less spheroidal starch grains up to 18 µ in diameter.

Habitat : U.S.A., from Canada to Carolina and Kentucky.

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 34.

Part used : Rhizome. Moisture content of fresh rhizome 233 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Caulophyllum Thalictroides in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

CAUSTICUM
(Caust.)

Common names : *English*: Tinctura acris sine Kali, Causticum Hahnemanni.

Description : This preparation has been introduced into Homoeopathic Pharmacy by Hahnemann and peculiar to homoeopathy. It is of indefinite composition and hence it should be made in strict accordance with Hahnemann's instructions. Take a piece of freshly burnt lime of about 1 kg, dip this piece into a vessel of purified water for about 1 minute; then lay it in a dry dish in which it will soon turn into powder with development of much heat and its peculiar odour, called lime vapour. Of this fine powder take 60 g and mix with it in a (warmed) porcelain triturating bowl, a solution of 60 ml of bisulphate of potash, which has been heated to red heat and melted, cooled again and then pulverised and dissolve in 60 ml of boiling water. This thickish mixture is put into a small glass retort, to which the helm is attached with wet bladder; into the tube of helm inserted the receiver, half submerged in water; the retort is warmed by gradual approach of a charcoal fire below and all fluid then distilled over by applying suitable heat. The distilled fluid will be about 30 ml of watery clearness, containing causticum in concentrated form. It smells like the lye of caustic potash. Taste burning in the throat; it freezes only at a lower temperature than of water. It does not respond to the tests for sulphates and for calcium.

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 35.

Preparation : (a) Mother Solution — Drug strength 1/2

Causticum	500 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x higher with *Dispensing Alcohol.*

CEANOTHUS AMERICANUS
(Ceano. am.)

Botanical name : *Ceanothus americanus* Linn **Family**: Rhamnaceae

Synonym : *C. herbaceous* Rafin.

Common names : *English*: New Jersey Tea; *French*: Ceanothe; *German*: Seckelblumen Wurzel.

Description : A low growing shrub, under 1 meter in height. Leaves alternate ovate to ovate-oblong, 4 to 10 cm long, acute or acuminate, finally toothed 3-veined from base, dull green above, pubescent beneath; petiole 6 to 12 mm long. Flowers in long-stalked cluster, 2.5 to 5 cm, long forming large panicles at end of branches. Flowsers, fragrant, small, each with a calyx of five sepals and a regular corolla.

Habitat : Grows in rocky woods and on gravelly slopes from Southern Canada, Florida and Westward to Kansas and Texas.

History and authority : Dict. of Practical Materia Medica. Clarke Vol. I, 441.

Part used : Leaves. Moisture contents of fresh leaves 150 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ceanothus Americanus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

Revised Monograph Appeared in HPI Vol. V

CHAMOMILLA
(Cham.)

Botanical name : *Anthemis nobilis* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Chamaemelum vulgaris, Chamomilla nostras, C. officinalis* K. Koch, *C. vulgaris* Gray.

Common names : *English*: Bitter Chamomile; *French*: Chamomille; *German*: Feld-Kamille.

Description : Annual herb with large, woody fibrous roots. Stem erect 30 to 60 cm high, solid, smooth, shining, strongly striate, with long, slender branches, leaves numerous, alternate, sessile, amplexicaul, upper simple the other by or tri-pinnatiafd, the segments strap shaped, narrow and minutely pointed. Flowers numerous terminal solitary on striated naked peduncles. Ray florets white, oblong with three teeth; the disc florets yellow and conical.

Macroscopical : Each dried flower head is hemispherical and about 12 to 20 mm in diameter. The florets are of a white to pale buff colour, the outer ones hiding the involucres of bracts. A few hermaphrodite, tubular florets are usually found near the apex of the solid receptacle. A transition between typical tubular florets and typical ligulate ones is often seen. The ligulate florets show three teeth (or occasionally two), the center one being that most developed. There are four principals veins. The corolla is constructed near its base into a tube from which bifid striate projects. The ovary is inferior and devoid of pappus. Each florets arises in the axel of a thin memberanous bract or pale which has a blunt apex. At the base of a receptacle is an involucre consisting of 2 or 3 rows of oblong bracts which have membranous margin chamomilla have a strong aromatic odour and a bitter taste.

Habitat : India, Asia and Europe

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 89.

Part used : Dried whole plant in flowering or the whole fresh plant.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Chamomilla, moist magma containing solids 100 g and plant moisture 500 ml	600 g
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I.

Revised Monograph Appeared in HPI Vol. VIII

CHELIDONIUM MAJUS

(Chel. maj.)

Botanical name : *Chelidonium majus* Linn. **Family**: Papaveraceae

Common names : *English*: Calandine, Celandine; *French*: Chelidoine; *German*: Schollkraut.

Description : An erect, perennial herb, 30 to 120 cm in height, loosely-branching with acrid saffron-coloured juice. Leaves deeply pinnatifid, the segments ovate or obovate, crenate or lobed, sometimes 2-pinnatifid; glaucous beneath. Flowers in a small peduncled umbels, 6 to 8 mm across; sepals 2, petals 4, yellow in colour, stamens many; ovary of 2 carpels, the style very short with 2-lobed stigmas; capsule, lined, 2.5 to 5 cm long, dehiscing from base upwards.

Habitat : Europe; in waste places, old walls, hedges, borders of highways, near habitations. Particularly in Germany and France.

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 127. Hahnemann introduced this in Mat. Med. in 1819.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Chelidonium Majus in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of tincture, four parts Purified Water and five Parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I.

CHININUM ARSENICOSUM

(Chin. ars.)

Chemcial Symbol : $(C_{20}H_{24}N_2O_2)_3\ H_3AsO_3.4H_2O$ **Mol. wt.** 1170.6

Common names : *English*: Quininae arsenis, Arsenite of quinine; *French*: Arsenite de quinine; *German*: Chininarsenit.

Description : A white, bitter crystals; odourless; Poison! It is slightly soluble in *water;* soluble in 15 parts of *alcohol*. It is prepared by the reaction of silver arsenite and quinine hydrochloride.

Identification : (i) To 0.5 ml of a saturated solution add 1 drop *dilute sulphuric acid;* a vivid blue fluorescence is produced.

(ii) To 5 ml of a 0.1 percent w/w solution add 2 or 3 drops of *solution of bromine* and then 1 ml of *dilute ammonia* solution an emarald green colour produced.

(iii) It yields to the *reaction,* characteristic of arsenites.

Assay : Weigh accurately about 0.5 g and dissolve in 20 ml of *water* and 5 ml of *dilute sulphuric acid* in a separator, add 5 ml of solution of *sodium hydroxide;* extract by shaking with successive quantities of 20 ml of *chloroform* until complete extraction of the alkaloid is effected, washing each quantity of chloroform in succession with the same quantities of 5 ml of *water*. Transfer the chloroform solution to tared vessel, remove the solvent by evaporation, add 2 ml of *ethyl alcohol*, evaporate, dry to constant weight at 105° and weigh. Each g of the residue is equivalent to 1.200 g of $(C_{20}H_{24}O_2N_2)_3H_3AsO_3.4H_2O$.

History and authority : Dict. of Practice. Mat. Med. Clarke Vol. I, 487. Allen's Encyclop. Mat. Med. Vol. III, 214.

Preparation : (a) Trituration 1x — Drug strength 1/10

Chininum Arsenicosum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, , 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Caution : Not to be prescribed below 2x.

CHININUM SULPHURICUM

(Chin. sul.)

Chemical symbol : $(C_{20}H_{24}O_2N_2)_2 .H_2SO_4.H_2O$ **Mol. wt.** 783.0

Common names : *English*: Quininae sulphas, Quinine sulphate; *French*: Sulfate de quinine; *German*: Chininsulfat.

Description : A white, fine, lustreless, needle-like crystals; odourless; taste very bitter and persistent. It is soluble in 500 parts of water, in 120 parts of alcohol. It is the sulphate of the alkaloid, quinine, obtained from the bark of various species of Chinchona. Contains not less than 99.0 percent and not more than the equivalent of 101.5 percent of $(C_{20}H_{24}O_2N_2)_2.H_2SO_4$ calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) To 0.5 ml of a saturated solution add 1 drop of *dilute sulphuric acid*, a strong blue fluorescence is produced.

(ii) To 5 ml of 0.1 percent w/v solution add 2 or 3 drops of *solution of bromine* and then 1 ml of *dilute* solution of ammonia, an emerald green colour is produced.

(iii) A solution in water responds to *tests* characteristic of sulphates.

Reaction : A saturated solution in *water* is neutral or not more than slightly alkaline to solution of litmus.

Loss on drying : Loses not less than 3.0 percent and not more 5.0 percent of its weight when dried to constant weight at 105°.

Sulphated Ash : Not more than 0.1 percent.

Assay : Weigh accurately about 0.5 g and dissolve in 5 ml of dilute sulphuric acid and 20 ml of *water* in separator. Add 5 ml of solution of sodium hydroxide, extract by shaking with successive quantities of 20 ml of chloroform, until complete extraction of the alkaloid is effected, washing each quantity of *chloroform* in succession with the same two quantities of 5 ml of *water*. Transfer the *chloroform* solution to a tared vessel, remove the solvent by evaporation, add 2 ml of *ethyl alcohol*, evaporate and dry to constant weight at 105°. Each g of residue is equivalent to 1.151 g of $(C_{20}H_{24}O_2N_2)_2.H_2SO_4$.

Storage : Preserve in a well-closed container, protected from light.

History and authority : This drug was first proved by Dr. Piper, Germany. Allen's Encyclop. Mat. Med. Vol. III, 215.

Preparation : (a) Trituration 1x — Drug Strength 1/10

Chininum Sulphuricum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

CICUTA VIROSA
(Cic.vir.)

Botanical name : *Cicuta virosa* Linn. **Family**: Umbelliferae (Apiaceae)

Synonym : *Cicuta aquatic* Gesneri.

Common names : *English*: Water hemlock; *Franch*: Cigue vireuse; *German*: Wasserschierling.

Description : A perennial, deciduous plant, with thick, white fleshy, tuberous hollow roots. The stem 30 to 120 cm high, hollow, branched, furrowed, smooth and often reddish. Leaves long, on long-sheathing petioles, biternate, sharply serrate, leaflets from 2.5 to 5 cm long. Flowers white numerous, small, on long slender, pedicel in large upright umbels, not crowded partly terminal and partly opposite. It is a deadly poison.

Habitat : India (Kashmir at 1600 m) Arctic regions. Growing in swamp and wet places.

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 281.

Part used : Root. Moist content of fresh root 233 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cicuta Virosa in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I.

Caution : Not to be prescribed below 3x.

CIMICIFUGA RACEMOSA
(Cim. rac.)

Botanical name : *Cimicifuga racemosa* Nutt. **Family**: Ranunculaceae

Synonym : *Actaea racemosa* Linn.

Common names : *English*: Black snake-root; *French*: Racine d'actee a'grappes; *German*: Schwarze Schlangenwurzel.

Description : An erect herb, 1 to 2.5 meter in height. Leaves ternate then pinnate then sometimes again divided; leaflets ovate or oblong, incisely toothed, mostly 4 to 8 cm long. Flowers grouped in a tall, spire like cluster often surrounded with smaller spikes. Each having four or five short lived sepals; the petal-like stamens are 2-lobed at their tips; pistils 1 to 2, sessile; the stigma broad and flat.

Macroscopical : The drug occurs as a mixture of entire or broken, rhizomes and roots. Rhizome horizontal, somewhat branched, 2 to 15 cm in length and from 2 to 55 mm in thickness, externally dusty brown, slightly annulate form circular scars of bud scales, the upper surface with several buds and numerous large stem bases terminated, frequently, by deep cup shaped, radiating scars, fracture horny, internally whitish and mealy or dark brown; waxy, bark thin, wood radiate.

Microscopical : Transverse section of Rhizomes exhibits a yellowish-brown suberised epidermis, several layers of starch and resin containing cortical parenchyma, 2 circles of open collateral fibro-vascular bundles, the outer being smaller than inner bundles. The xylem tracheae contains bordered pores and numerous strongly lignified wood fibres, medullary rays separating the bundles, containing starch and a central pith whole cells resemble those of cortex.

Habitat : U.S.A. from Maine to Michigan, Canada and Southwards.

History and authority : Dr. Hougton-N. A.J. of Hom. V. 27.1856. Allen's Encyclop. Mat. Med. Vol. X, 468.

Part used : Rhizome.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cimicifuga Racemosa in *coarse powder*	100 g
Purified Water	385 ml
Strong Alcohol	650 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class II

Revised Monograph Appeared in HPI Vol. IX

CINA
(Cina)

Botanical name : *Artemisia martima* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Absinthium austriacum tenuifolium, Artemisia austriaca* Jacq., *A. contra* L., *A. cina* Berg.

Common names : *Hindi*: Kirmala; *English*: Wormseed, Tartarian southern-wood; *French*: Graine de Zedoaria; *German*: Zittersaame Wurmsaame.

Description : An evergreen, perennial shrub, with many slender erect flowering stems, upto 1 meter high, much branched. Flower heads about 2 to 3 mm long, oblong, ovoid sessile, pale brownish-green colour, odourous with bitter taste.

Macroscopical : The flower heads are of a greenish-yellow colour, but turn brown by drying and keeping. These are from 1.5 to 4 mm long, elongated-ovoid in shape and somewhat angular; their surface is shining and only slightly hairy. A few fragments of leaves and stalks always occur admixed with the flower heads. The involcre consists of fourteen to twenty, most commonly sixteen, imbricated ovate or lanceolate bracts, each having a distinct keel and bearing on the dorsal surface numerous, glistening compositous glandular trichomes and a very few cottony blonde hairs; the mid-rib branches freely and the vein-lets are contorted and frequently anastomose. The bracts enclose about 3 to 5 tubular hermaphrodite florets, about 1 mm long and 0.5 mm wide, the apices of the five corolla lobes being slightly papillose but not bearing trichomes; compositous glandular trichomes occurs on the outer surface of the corolla and ovary. The pollen grains are spherical, about 20 to 25 µ in diameter with 3 germinal furrow and 3 pores; the surface of the exine very finely granular, but has no spines.

Habitat : In temperate region, western Himalayas.

History and authority : Introduced in Homoeopathy by Hahnemann in 1829. Allen's Encyclop. Mat. Med. Vol. III, 307.

Part used : Flower heads.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cina in moderately *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

Potencies: 2x and higher with *Dispensing Alcohol*.

Trituration: 1x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

Old method : Class IV

Revised Monograph Appeared in HPI Vol. X

CINCHONA OFFICINALIS
(Cinc. of.)

Botanical name : *Cinchona officinalis* Linn. **Family**: Rubiaceae

Synonyms : *C. succirubra* Pav. ex Klotzsch , *C. condaminea* Humb and Bonpl, *C. calisaya* Wedd., *C. rubra* L.

Common names : *Hindi*: Kunain Ka Pair; *English*: Peruvian bark; *French*: Quinquina; *German*: Chinarinde.

Description : A slender tree, 7 to 10 meter high, rough, brown, yellow within, with black and whitish marking on the bark. Leaves small, smooth, ovate-lanceolate; shining and reddish petioles. Flowers rosy.

Macroscopical : Stem bark quilled or curved pieces, up to 30 cm or more long and from about 2 to 6 mm thick; outer surface dull brown-grey or grey frequently bearing lichens and mosses; usually rough, being marked with transverse fissures varying in type, according to the species and often numerous; longitudinally either furrowed or wrinkled and fissured, exfoliation of the outer bark occurring in some varieties; inner surface striated and varying in colour, from pale-yellowish brown to deep reddish-brown; fracture short in the external layers and fibrous in the inner layers.

Microscopical : The diagnostic characters are thin walled cork cells; numerous isolated, yellowish, spindle-shaped, striated phloem fibres, upto 90 µ in diameter with conspicuous somewhat funnel shaped pits; small number of starch grain, about 6 to 10 µ in diameter from the parenchyma; parenchymatous idioblasts filled with microcrystals of calcium oxalate; very rare stone cells. The most important alkaloid is quinine.

Habitat : India (Nilgiris, Assam and Khasia hills) & Sikkim, at an elevation of 2,000 to 2,500 meter.

History and authority : Allen's Encyclop. Mat. Med. Vol. III, 182, X 460.

Part used : Bark.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cinchona Officinalis in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration: 1x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Class IV (Tincture)

COCCULUS INDICUS
(Coc. ind.)

Botanical name : *Anamirta cocculus* W. & A. **Family**: Menispermaceae

Synonym : *Anamirta paniculata* Colebr.

Common name : *Hindi*: Kakamari.

Description : A large, woody climber with corky bark. Leaves 10 to 20 cm long, broadly ovate, acute or obtuse, rounded or sub-cordate at the base, thinly coriaceous, glabrous above, paler and with small tufts of hairs in axils of the veins beneath; petioles thickened and prehensile at lower ends. Flowers 6 mm in diameter, pale greenish-yellow, sweet scented. Sepals imbricate, ultimately reflexed. Ripe carpels sub-globose, 12.5 mm, smooth, black. The dried fruits are known as *Cocculus indicus* Royle.

Macroscopical : Drupe dusky reddish-brown to moderate brown, reniform and wrinkled; 8 to 13.5 mm in length, 7 or 11 mm in breadth and 7 to 10 mm in thickness, base marked by a circular stems scar; pericarp tough, about 1 mm in diameter, enclosing a single seed; seeds yellowish-grey, urn-shaped.

Microscopical : Pericarp consists of epicarp, mesocarp and endocarp. Epicarp a layer of more or less cubical shaped cells. Mesocarp consisting of an outer region of thin-walled cells with brown glandular contents, which become reddish-brown with solution of potassium hydroxide, a zone of elongated brownish-red cells in which occur coarse fibro-vascular bundles; several rows of yellowish cells; endocarp strongly lignified, porous, sclerenchymatous fibres. Endosperm is composed of polygonal cells with thin walls containing aleurone, fixed oil and acicular crystals insoluble in potassium hydroxide solution, alcohol or water, soluble in HCl.

Habitat : India (Malabar, Assam), East Pakistan, Ceylon Burma, Malaya and East Indian islands.

History and authority : Mentioned in Homoeopahty literature by Hahnemann in 1805 Freg. d. v. Med. Pos. Allen's Encyclop. Mat. Med. Vol. III, 338.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cocculus Indicus in *coarse powder* — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

N. B. some fatty acid will tend to come in the solution, which on cooling to 10° or below will precipitate out, which can be discarded by filtration.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV

Revised Monograph Appeared in HPI Vol. X

COFFEA CRUDA
(Coff. cr.)

Botanical name : *Coffea arabica* Linn. **Family**: Rubiaceae

Common names : English: Coffee; *French*: Cafe; *German*: Kaffee.

Description : An evergreen shrub or small tree attaining a height of 5 to 10 meter under cultural conditions in India, it is kept down to a height of 1.5 to 2 meter. It has main stem with lateral branches, which grow in pairs opposite each other or in whorls around the stem. Leaves also opposite, thin coriaceous and bright green in colour. Flowers white, fragrant, borne in clusters in the axills of leaves. Fruit smalls, fleshy drupes, bright green, when young changing to yellow and later two scarlet red with ripening. The fleshy mucilaginous pulp of the drupe encloses to oval greenish of grey seeds of beans.

Microscopical : The diagnostic characters are: sclereids about 100 to 250 to 1,000 µ long by 15 to 30 to 135 µ wide, embedded in the collapsed parenchyma of the papery inner seed coat; thick walled cellulosic, polyhedral parenchyma containing oil, plasma and possessing brownish cell walls with large oval pits, which gives a beaded appearance in section.

Habitat : Cultivated in India, native of Abysinia.

History and authority : Introduced by Dr. Stapf in 1823. Allen's Encyclop. Mat. Med. Vol. III, 435.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Coffea Cruda in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Old method : Class IV (Tincture)

Revised Monograph Appeared in HPI Vol. IX

COLCHICUM AUTUMNALE

(Colch. at.)

Botanical name : *Colchicum autumnale* Linn. **Family**: Liliaceae

Synonyms : *Autum cormus, Colchicum luteum* Baker.

Common names : *Hindi*: Hirantutiya; *English*: Meadow saffron; *French*: Colchique; *German*: Herbstzeitlose.

Description : An annual herb, underground stem (Corm) tunicate; leaves few appearing usually in spring, lanceolate, 25 cm or less long and 5 cm or less wide. Flowers 1 to 4 or 6, 7 to 10 cm across when expanded, appearing in autumn, with slender tube; several inches long that elevates the purple oblong obtuse veined segments above the group; Segments 2.5 to 7 cm long; stamens 6, less than half as long as segments; capsule 2.5 to 3.8 cm arising with foliage in spring.

Macroscopical : Corm in slices, upto 2 to 5 mm thick and sub-reniform to ovate in outlines, with yellowish, edges; a few pieces are sub-conical or plano-convex. The slices are hard and break readily with a short, mealy fracture; the cut surfaces are white and starchy, show vascular strands as small greyish points.

Microscopical : The diagnostic characters are: The brown epidermal cells with indistinctly pitted, slightly, wavy walls; the abundant large-celled parenchyma containing numerous starch grains, usually compound, with 2 to 4 upto 7 components, but sometimes single, individual grains being spherical or ovoid to polyhaderal or muller-shaped, 3 to 30 μ in diameter, with a triangular or stellate, central hilum; the occasional vessels, with spiral or annular thickening, the absence of sclerenchyma and calcium oxalate crystals.

Habitat : Cultivated in India. Also found in Europe.

History and authority : Introduced in Homoeopathic practice by Dr. Starpf in 1826. Allen's Encyclop. Mat. Med. Vol. III, 248.

Part used : Bulbs. Moisture content of fresh bulb 233 ml. per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Colchicum Autumnale, moist magma containing solid 100g and plant moisture 233 ml	333 g
Purified Water	267 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I

COLOCYNTHIS
(Coloc.)

Botanical name : *Citrullus colocynthis* (Linn.) Sch. **Family**: Cucurbitaceae

Synonyms : *Colocynthis vulgaris* (Linn.) Sch., *Cucumis colocynthis* (Linn.) Sch.

Common names : *Hindi*: Mahendravaruni; *English*: Bitter gourd; *French*: Coloquinte; *German*: Koloquinten.

Description : An annual, deciduous climber with large, long woody and branched roots, from which arise several slender, rough angular, pale green above, ashy beneath, deltoid 3 to 7 lobed, tough stems, with alternate, petiolate multi-fid leaves, variable in size. Flowers yellow, large, solitary, axillary, monoecious, pedunculate. Fruit pepo or gourd, the size and shape of an orange from 6 to 10 cm in diameter, yellow with a thin, solid, smooth rind, containing spongy, very bitter pulp. Seeds 4 to 6 mm long, pale brown.

Macroscopical : The dried pulp occurs in white or pale, yellowish-white, light, pithy fragments. Very few seeds escape removal, they are about 7 mm long and flattened-ovoid, the testa is yellowish-white to dark brown, smooth externally and extremely hard, the seed is exalbuminous, the embryo contains a large amount of fixed oil, the rind is about 1 mm thick, externally buff coloured, glabrous and granular, the inner surface is whitish and marked by impressions of seeds.

Microscopical : The diagnostic characters are: the large, thin-walled parenchymatous cells separated by intercellular spaces and showing flat, rounded, pitted areas, where they are in contact, the occasionally spiral and annular vessels; the absence of starch grains, crystals of calcium oxalate and of sclerenchymatous cells excepting such small proportions as correspond to an amount of seeds, not exceeding 5 % and to an amount of outer sclerenchymatous part of paricarp not exceeding 2 %.

Habitat : Growth in warm and dry situations in India, Ceylon, Arabia, North Africa, Cap of Good Hope and Japan.

History and authority : Proved by Hahnemann in 1821. Allen's Encyclop. Mat. Med. Vol. III, 477.

Part used : Pulp of the fruit rejecting the seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Colocynthis in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class IV.

CONIUM MACULATUM
(Con. mac.)

Botanical name : *Conium maculatum* Linn. **Family**: Umbelliferae (Apiaceae)

Common names : *Hindi*: Kurdumana; *English*: Poison Hemlock; *French*: Cigue; *German*: Schierling.

Description : A poisonous, much branched herb, 30 to 60 cm in height with stems speckled reddish-purple. Leaves pinnately decompound, the segments pinnati-fid and toothed. Flowers white in compound many-rayed umbels with few bracts and bractioles; carpels-ribbed. Fruit broadly ovate, laterally compressed and at the commenisures more or less constricted ribs somewhat tuberculate.

Microscopical : The diagnostic characters are: epidermal cells with striated cuticle, wavy anticlinal walls and containing yellow dendritic crystals of diosmin, the cells at the margin in about 3 longitudinal rows in both upper and lower surfaces, stomata rarunculaceous, rare on upper surface and numerous on lower surface; water pores on upper surface at tips of teeth; single layer of palisade tissue; petiole, approximately oval in transverse section with about 9 shallow, external, collenchymatous ridges a single collateral bundle being with present opposite each ridge and thus forming a circle of bundles around central cavity; solitary secretory canal adjoining each phloem group and additional but similar canals flanking xylem of each bundles in petiole; rachis with structure similar to that of petiole but with fewer angles and a shallow median groove on the upper surface; absence of trichomes, calcium oxalate and sclerids from the lamina.

Habitat : Temperate regions of Asia, Europe and N. Africa.

History and authority : Hahnemann published his proving in 1825. Allen's Encyclop. Mat. Med. Vol. III, 519.

Part used : The whole plant. Moisture content of fresh plant 300 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Conium Maculatum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	637 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class I

CRATAEGUS OXYACANTHA

(Crat. oxy.)

Botanical name : *Crataegus oxyacantha* Linn. **Family**: Rosaceae

Common names : *English*: Ringo, Pingyat, Phindak, Hedge thorn; *Hindi*: Ban-sangli, Ring.

Description : An ornamental tree, 6 to 9 meter in height, with spreading branches and stout spines upto 2.5 cm long, cuneate at base with 3 to 5 usually serrate lobes; glabrous leaves. Flowers white, 16 mm across in glabrous, 5 to 12 flowered clusters, sepals entire. Stamens 20, with red anthers, styles 2 to 3. Fruit scarlet, sub-globose to broad elipsoid, 9 to 16 mm long nutlets 2, furrowed on the innerface.

Habitat : Native of Asia and Europe. North Western Himalayas, from Indus to Ravi at altitude of 1800 to 3000 meter.

History and authority : Introduced into Homoeopathic medicine as a heart remedy by Dr. Greene, of Eonis Ireland. A Dictionary of Practical Mat. Med. Clarke. Vol. I, 605.

Part used : Berries. Moisture content of fresh berries 200 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Crataegus Oxyacantha in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class III

CROTON TIGLIUM

(Crot. tig.)

Botanical name : *Croton tiglium* Linn. **Family**: Euphorbiaceae

Common names : *Hindi*: Jamal ghota; *English*: Croton oil plant, Purging nut; *French*: Huie de croton; *German*: Crotonol.

Description : A small evergreen tree, 5 to 7 meter high. Young shoots sparsely stellately hairy. Leaves 5 to 10 cm long, thinly membranous, glabrous ovate, acuminate. Capsule 18 mm long, white, turbinately ovoid, obtusely trigamous, 3 seeds, the seeds resemble castor beans in general structure. The oil which amounts to 35 to 45 % of the whole seed is viscid with nauseous odour, when extracted from seeds is a transparent, sherry coloured, viscid liquid, slightly flourscent, has a faint rancid smell and oleaginous acrid taste. It is poisonous. It is soluble in alcohol. Specific gravity 0.935 to 0.950.

Macroscopical : Seeds, albuminous, ovate-oblong, slightly quadrangular, convex on the dorsal and somewhat flattened on the ventral surface; from 10 to 15 mm in length, externally dull greyish brown, often mottled with black due to abrasion in the testa, caruncle readily detached and usually absent in the drug of commerce.

Habitat : Bengal, Assam, South India, Burma, either in a naturalised or cultivated state.

History and authority : Joret mentioned this in Homoeopathic literature in 1834. Allen's Encyclop. Mat. Med. Vol. III, 606.

Part used : Oil from seeds.

Storage : Should be kept in well closed and protected bottle from light.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/100

Croton Tiglium	10 ml
Strong Alcohol	990 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 3x higher with *Dispensing Alcohol.*

Old method : Class VI b (Tincture)

Caution : Not to be prescribed below 3x.

CUPRUM ARSENICOSUM
(Cup. ars.)

Chemical symbol : $CuHAsO_3$ **Mol. wt.** 187.468

Common names : Cuprii arsenis, Arsenite of copper, Sheele's green; *French*: Arsenite de cuivre; *German*: Kupferarsenit.

Description : A yellowish-green or light green powder. Poison. It is insoluble in water and in alcohol; soluble in dilute acids and in alkalies. It is prepared by acid potassium arsenite to a solution of copper sulphate.

Identification : (i) It responds to the *reactions* characteristic of copper and arsenites.

(ii) A solution of cuprum arsenicosum with a solution of *potassium ferricyanide*, a reddish-brown precipitate or in very dilute solution, a reddish-brown colour is produced.

(iii) A solution of *potassium hydroxide* is blue in colour produced but when boiled, cupric oxide is deposited.

Assay : Weigh accurately about 0.5 g add 25 ml of *dilute hydrochloric acid*, 2 g of *potassium iodide* and titrate the liberated iodine with 0.1 N *sodium thiosulphate* solution, using solution of *starch* as indicator. Continue titration till a faint blue colour remains, add 1.5 g of *potassium thiocyanate*, stir well and continue the titration until the blue colour disappears. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01875 g of $CuHAsO_3$.

History and authority : Allen's Encyclop. Mat. Med. Vol. IV, 28.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cuprum Arsenicosum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Caution : Not to be prescribed below 3x.

CUPRUM METALLICUM
(Cup. met.)

Chemical symbol : Cu **At. wt.** 63.54

Common names : Cupreum filum, Copper; *French*: Cuivre; *German*: Kupfer.

Description : A reddish, lustrous, malleable and ductile metal. It may be in the form of a very fine powder. Becomes gradually coated with a green basic carbonate, when gradually exposed to air. Next to silver, it is the best conductor of electricity. Its specific gravity is 8.9. It melts at 1083°. It is very slowly attacked by hydrochloric or dilute sulphuric acid but is readily dissolved by dilute nitric acid. It slowly dissolves in ammonia water. It is found in nature in elementary state and is commercially obtained from its minerals; contains not less than 99.5 percent of Copper.

Identification : (i) An addition of excess of *ammonia* to a solution in *hydrochloric acid* produces ultimately a deep-blue coloured solution.

(ii) When a solution in *hydrochloric acid* is treated with a solution of potassium ferro-cyanide, a reddish-brown precipitate is formed.

Assay : Dissolve about 0.25 g accurately weighed in sufficient quantity of hot concentrated *sulphuric acid* and dilute to 50 ml with purified water, add 3 g of *potassium iodide* and 5 ml of *acetic acid* and titrate the liberated iodine with 0.1 N *sodium thiosulphate* using solution of starch as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.006354 g of Cu.

History and authority : Allen's Encyclop. Mat. Med. Vol. IV, 34.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cuprum Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VII & X

DIGITALIS PURPUREA

(Dig. pur.)

Botanical name : *Digitalis purpurea* Linn. **Family**: Scrophulariaceae

Common names : *English*: Common Foxglove; *French*: Gant de Notre Dame; *German*: Fingerhut.

Description : A biennial, sometimes perennial herb, up to 2 meter in height. It bears during the first year, a rosette of radical rugose, somewhat downy leaves, 15 to 30 cm long, ovate to obovate-lanceolate with long winged petioles. From the centre of the leaf-rosette arises in the second year, a single erect flowering axis with sessile and subsessile leaves terminating in a one sided raceme. Flowers 5 to 8 cm long, declines, tubular, campanulate, purple, yellow or white; seed, small and light.

Microscopical : Leaf, bearing on the apex of each marginal tooth, one large water pore, rarely 2 epidermal cells, polygonal, about 30 to 60 µ long with smooth cuticle, anticlinal walls slightly wavy on the upper surface, markedly wavy on the lower surface. Covering trichomes, usually 3 to 5 cells long, uniseriate, bluntly pointed and finely warty, sometimes with collapsed cells, glandular trichomes having a unicellular or uniseriate stalk and unicellular or bicellular head. Stomata, of the ranunculaceous type, more numerous on the lower than on the upper surface. Midrib, strongly convex below, covered with simple and glandular hairs containing an arc of radiate xylem; a narrow phloem and a collenchymatous pericycle; Mesophyll with a palisade in one layer occasionally in 2 or 3. Sometimes not differentiated, spongy mesophyll of stellate cell.

Habitat : Cultivated in India, Southern and Central Europe, England, Norway, Madeira and the Azores.

History and authority : Mentioned by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. IV, 92.

Part used : Leaves of the second year's growth. Moisture content of leaves 567 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Digitalis Purpurea in moderately *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I

DIOSCOREA VILLOSA

(Dios. vil.)

Botanical name : *Dioscorea villosa* Linn. **Family**: Dioscoreaceae

Common names : *English*: China root, Colic root, Devil's bones; *French*: Rasee du soleil; *German*: Sounenthau.

Description : Rootstock slender, elongated, rarely forked, with a few or more slender branches. Stem glabrous and subterete. Leaves usually alternate, but lower sometimes in 2's or 4's, broadly ovate with heart shaped base, more or less pubescent beneath, 5 to 15 cm long, 9 to 13 nerved, petioles often longer than the blades. Flower greenish-yellow, staminate in drooping panicles, 8 to 15 cm long, pistillate in drooping spicate racemes; carpels membranous 1.25 to 2.5 cm long, strongly 3 winged.

Macroscopical : Rhizome horizontal, knotted, woody and elongated; often compressed, bent and branched, frequently broken into pieces of varying lengths and 6 to 20 mm thick, bearing scattered nodular lateral projections, tough filiform rootlets or thorn like root remain in circular depression below and depressed stem scars, occasionally slender twisted portion of aerial stems above, externally moderate brown to light yellowish-orange, somewhat scaly. Fracture very tough and short; fractured surface yellowish-white to pale yellowish-orange, with many small-scattered, yellowish wood bundles, odour indistinct.

Microscopical : Section of the rhizome exhibits the following structures. Epidermis, thin-walled cells, detached at several places. Cortex of several layers of ordinary parenchyma with yellowish walls, occasionally suberosed and a few layers of tangentially elongated, thin-walled, parenchyma; endodermis and pericycle indistinct. Stele, a broad zone of longitudinally elongated thick-walled porous, partially lignified parenchyma containing starch and occasionally raphides of calcium oxalate. Through this region are scattered, closed collateral fibro-vascular bundles.

Root: transection shows an epidermis of thin-walled cells, a cortex of thin-walled, slightly lignified parenchyma and endodermis whose inner and radial walls are slightly lignified, being separated by thick-walled shortly lignified fibres and lignified pith.

Habitat : Native of United States.

History and authority : Mentioned in Homoeopahtic Literature by Dr. Nichols in 1866. Allen's Encyclop. Mat. Med. Vol. IV, 123.

Part used : Rhizome. Moisture content of fresh Rhizome 150 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Dioscorea Villosa in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and 6 parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

Revised Monograph Appeared in HPI Vol. IX

DROSERA ROTUNDIFOLIA

(Dros. rot.)

Botanical name : *Drosera rotundifolia* Linn. **Family**: Droseraceae

Common names : *English*: Round leaved sundew; *French*: Rosee du soleil; *German*: Sonnenthau.

Description : A glandular-pubescent herb with tufted, basal leaves clothed with glandular sensitive hairs, which secrete gelatinous fluid that entraps insects. Leaves spreading on the ground; the blades orbicular or nearly so; 6 to 12 mm broad, abruptly narrowed to a flat petiole, the upper surface clothed with glandular hairs. Scape glaborous, 1 to 25 flowered; pedicles 2 to 4 mm long. Flowers shining in sun, 4 mm broad; pentamerous; petals white or reddish, oblong. Capsule scarcely exceeding the sepals. Seeds spindle shaped the testa loose.

Habitat : Europe, North America and Asia.

History and authority : Introduced into Homoeopathy by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. IV, 170.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Drosera Rotundifolia in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class I

DULCAMARA
(Dulc.)

Botanical name : *Solanum dulcamara* Linn. **Family**: Solanaceae

Synonyms : *Amara dulcis, Dulcis amara.*

Common names : *Hindi*: Kakmachi; *English*: Bitter Sweet; *French*: Douce-amere; *German*: Bittersuss.

Description : A deciduous, climbing shrub with a woody, irregularly branched, creeper, yellowish-green root, smelling like potato, stems woody at base, pubescent above, alternately branched. Leaves alternate, petiolate, entire, lower ones cordate, upper hastate or with two ear like lobes at the base, pubescent beneath. Flowers purple, small lateral, extra axillary, drooping cymes. Berries scarlet, oval and poisonous.

Macroscopical : In short cylindrical, obliquely or transversely cut pieces, form 3 to 10 mm in length and 4 to 7 mm in diameter, outer surface longitudinally striated, more or less warty and occasionally with leaf scars, cut surface exhibiting a thin brownish to greenish-brown, dark, a broad greenish-brown or greenish-yellow wood, usually showing 1 or 2 concentric rays and a central hollow pith area.

Microscopical : Powder: light yellowish-brown, tracheids up to 112 µ in diameter and with bordered pores, spiral markings, lignified woody fibres with a few pores; non-lignified bast fibres with walls up to 20 µ in thickness; fragments of cork cells, a few simple unicellular hairs up to 800 µ in length, a few starch grains, spheriodal and sphenoidal microcrystals.

Habitat : Europe, Asia, Africa and North America.

History and authority : Allen's Encyclop. Mat. Med. Vol. IV, 178.

Part used : Whole plant, plants growing where the rootlets run into water or preferable.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Dulcamara in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	685 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I

ECHINACEA ANGUSTIFOLIA
(Echin. an.)

Botanical name : *Echinacea angustifolia* DC. **Family**: Compositae (Asteraceae)

Synonym : *Brauneria angustifolia* Heller.

Common names : *English*: Narrow-leaved cone flower, Black Sampson.

Description : An erect herb, 30 to 60 cm in height, sparsely or densely hispid. Leaves alternate, simple, lanceolate to nearly linear, 8 to 20 cm long, entire, all attenuate at base; the lower into slender petioles; heads solitary on long peduncles terminating the stem and few branches; rays purple, about 2.5 cm high, 2-toothed at apex, spreading or drooping, fruiting disk often 2.5 cm high.

Habitat : Found in America and Central Europe.

History and authority : The proving of this remedy was taken by Dr. J.C. Fahnestock and also contributed by T.C. Duncan. A Dictionary of Pract. Mat. Med. Clarke Vol. I, 691.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Echinacea Angustifoila in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	825 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part mother tincture, two parts Purified Water and 7 parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

EUPATORIUM PERFOLIATUM

(Eup. perf.)

Botanical name : *Eupatorium perfoliatum* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *E. connatum* Michx., *E. salviaefolium* Sims., *E. virginicum.*

Common names : *English*: Indian Sage, Cross wort, Sweating plant, Ague weed; *French*: Herbe d' eupatoire perfoliee; *German*: Durchwachsdost.

Description : A deciduous, perennial herb, with a horizontal root, the plant is up to 1.3 meter high, stout, erect, villous, round and branching at the top. Leaves opposite, lanceolate, prominently ribbed, rugose, united at the base around the stem (connate-perfoliate), serrate, shining green above, pubescent beneath, 12 to 20 cm long, 2 to 5 cm wide at the base. Flowers purplish-white, in 30 to 40 flowered heads, stalked, rather small, in dense, opposite branched, axillary and terminal cymes.

Habitat : Found in North America.

History and authority : Allen's Encyclop. Mat. Med. Vol. IV, 234.

Part used : Leaves and tops while in flower. Moisture content of fresh plant 300 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Eupatorium Perfoliatum in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

EUPHRASIA OFFICINALIS
(Euph. of.)

Botanical name : *Euphrasia officinalis* Linn. **Family**: Scrophulariacea

Synonyms : *Euphrasia candida, E. latifolia* L., *E. pratensis* Sebast. & Mauri, *E. pusilla* A. Kern.

Common names : *English*: Eye-bright, Euphrasay; *French*: Eurphraise; *German*: Augens rost.

Description : An annual herb, with a white, fibrous root and an erect, opposite, branching, hairy stem up to 2 meter in height. Leaves opposite, ovate or lanceolate, bluntly dentate; the lower ones crenate, the floral, briskly toothed. Flowers small, solitary, whitish, yellowish or bluish, inodourous and appear in leafy, axillary spikes at tops of branches.

Habitat : Temperate Himalayas, Europe and the summit of the white mountains of New Hampshire. Lake Superior region and Northwards.

History and authority : Allen Encyclop. Mat. Med. Vol. IV, 254.

Part used : Whole plant. Moisture content of fresh plant 200 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Euphrasia officinalis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water*;* and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class II.

FERRUM METALLICUM
(Fer. met.)

Chemical symbol : Fe **At. wt.**: 55.847

Common names : Ferrum reductum, Iron reduced by hydrogen; *French*: Fer reduit par L' hydrogene; *German*: Reducirtes Eisen.

Description : An odourless; greyish-black powder, all of which is required to pass through a No. 100 sieve. It is almost lusterless. It is stable in dry air, but in moist air, it is slowly oxidised to a hydrated ferric oxide. It is insoluble in water and in alcohol; soluble in dilute mineral acids with the evolution of hydrogen. It is prepared by passing hydrogen through heated ferric oxide (Fe_2O_3) until the reduction is complete. Contains not less than 90 percent of Fe.

Identification : (i) Make a solution of 0.2 g of the preparation in 5 ml of *dilute hydrochloric acid* and dilute the obtained solution with an equal amount of water. On adding a solution of *potassium ferrocyanide*, a dark blue precipitate is formed.

(ii) A solution in mineral acids, yields a black precipitate with *ammonium sulphide*.

Sulphides : 1 g of the solution in 25 ml of *dilute hydrochloric acid*, the evolving gas should not immediately turn black, the filter paper moistened with a solution of lead acetate.

Coal, silicic acid : The solution obtained in the 'sulphides' is filtered through, a tared filter, wash the flask and filter until a negative test for chloride, then dry the filter at 105° to constant weight. The residue should not exceed 0.01 g.

Assay : Shake in a stoppered flask for ten minutes about 0.25 g, accurately weighed, with a hot solution of 1.25 g of copper sulphate in 20 ml of water; filter rapidly and wash the filtrate with water; acidify the mixed filtrate and washing with *sulphuric acid* and titrate with 0.1 N *potassium permanganate*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.005585 g of Fe.

Storage : Preserve in well tightly closed containers.

History and authority : Allen's Encyclop. Mat. Med. Vol. IV, 303.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

FERRUM PHOSPHORICUM
(Fer. phos.)

Chemical symbol : $Fe_3(PO_4)_2.8H_2O$

Common names : Ferri phosphas, Ferroso-ferric phosphate.

Description : It consists of a mixture of hydrated ferrous phosphate, ferric phosphate and some hydrated oxides of iron. A greyish-blue amorphous powder; odourless and tasteless. It is insoluble in water and alcohol; readily soluble in hydrochloric acid Its colour darkens on exposure to air. It is commonly prepared by the interaction of ferrous sulphate, sodium phosphate and sodium bicarbonate in aqueous solution. Contains not less than 47 percent of ferrous salts, calculated as $Fe_3(PO_4)_2.8H_2O$.

Identification : It responds to the *reaction*, characteristic of phosphate and iron.

Arsenic : Not more than 5 parts per million.

Sulphate : 0.5 g dissolved in 2 ml of *hydrochloric acid*, complies with the *limit* test for *sulphates* .

Assay : Dissolve about 1 g, accurately weighed, in 20 ml of a 25 percent w/v solution of *sulphuric acid* in water in a stoppered flask. Add 6 ml of strong solution of *iodine monochloride* and 60 ml of *hydrochloric acid*; titrate with 0.05 M *potassium iodate* until the solution becomes light brown in colour; add 5 ml of *chloroform* and continue the titration until the chloroform becomes colourless. Each ml of 0.05 M *potassium iodate* is equivalent to 0.03344 g of $Fe_3(PO_4)_2.8H_2O$.

History and authority : Dr. Schussler introduced it and Dr. John Moffat proved this drug. Allen's Encyclop. Mat. Med. Vol. X, 525.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Phosphoricum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

FICUS RELIGIOSA

(Ficus. rl.)

Botanical name : *Ficus religiosa* Linn. **Family**: Moraceae

Common names : *Hindi*: Pipal, Sanak, Ashwath, Pippala.

Description : A large, glabrous tree, usually at first epiphytic; bark grey, exfoliating in roundish irregular flakes. Leaves coriaceous; shining, long petioled, drooping, 10 to 18 cm long, ovate-rotund, entire, narrowed upwards and with the apex produced into linear lanceolate tails 1/3 the whole length of the blade; base broad; rounded or truncate or sometimes in young leaves, cordate; petioles 7 to 10 cm long, slender, terete, stipule minute, ovate, acute. Receptacles in pairs, axillary, sessile, smooth, depressed, globose, 1.25 cm in diameter, dark purple when ripe; basal bracts 3; spreading, coriacous. Male flowers few only near the mouth of some receptacles, absent in others; sessile sepals 3, broadly ovate, stamen 1, filament short. Gall and fertile flowers sessile or pedicelled, the gall flowers predominating, many without a perianth, sepals 5, lanceolate. Style short, stigma rounded.

Microscopical : Leaf: the hairs commonly present or of glandula and non-glandula types, vary in length and in the number of component cells. Glandular spots, sometimes described as wax glands on the surface are common. The epidermis of the leaf consists of one to several layers of cells. The cell walls or silicified or calcified. Leaf dorsiventral; stomata are of ranunculaceous type and or found on only lower surface. Mesophyll is not distinctly differentiated and entire consisting of a palisade tissue. Cytolith are present. Laticiferous secretory cells are widely distributed in leaf and petiole. Isolated prismatic crystals of calcium oxalate are distributed around vascular bundles in leaf as well as in petiole.

Habitat : India

History and authority : Dr. Sarat Chandra Ghose of Midnapore did the first proving and introduced into Homoeopathic Practice. A Dictionary of Pract. Mat. Med. Clarke Vol. I, 779.

Part used : Tender leaves. Moisture contents of the fresh leaves 265 ml per 100 g of solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ficus Religiosa, moist magma containing solids 100 g and plant moisture 265 ml	365 g
Strong Alcohol	765 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

GELSEMIUM SEMPERVIRENS
(Gels.)

Botanical name : *Gelsemium sempervirens* (Linn.) Ait F. **Family**: Loganiaceae

Synonym : *Bignonia sempervirens* Linn.

Common names : *English*: Bignonia; *French*: Sauvage; *German*: Gift Jasmin.

Description : An evergreen vine, sometimes climbing upto 8 meter. Leaves opposite, lanceolate to ovate-lanceolate, 2.5 to 10 cm long, entire, short petioled, acute or acuminate, shining above. Flowers showy, very fragrant, dimorphous, in 1 to 6-fid cymes, bright yellow, 2.5 to 4 cm long; blooming throughout season; corolla funnel form, 5 lobed; style slender. Fruit a capsule, flat, 2.5 to 9 cm long, septicidally dehiscent by 2 valves at summit seeds flattened and winged.

Macroscopical : Rhizome, usually straight, almost cylindrical pieces, 5 to 50 cm long and 3 to 30 mm thick; attached to the rhizome are larger roots or small fibrous roots and sometimes small portions of slender aerial stems of a dark purplish colour. Rhizome, light yellowish-brown externally, longitudinally wrinkled, with purple reticulate lines on old pieces; internally light brown or pale yellow, the drug is tough and the fractured splintery the smoothed, transversely cut surface showing conspicuously radiate structure, narrow yellowish xylem wedges with small wedges alternating with straight, whitish medullary rays; center of rhizome usually occupied by a small, disintegrated pith with four strands of premedullary phloem; root closely resembling the rhizome, but somewhat tortuous and of a uniform, light brown colour.

Microscopical : The diagnostic characters are: thin walled cork cells, small amount of cortical parenchyma, containing spheroidal starch grains, up to 8 µ in diameter, prisms of calcium oxalate, upto 30 mircons long, found in medullary rays of phloem; abundant xylem elements; lignified cells and the medullary rays in the xylem.

Habitat : Found in Virginia and Mexico in rich moist ground, along the sea coast.

History and authority : Introduced into Homoeopathic Practice by Dr. Metcafe in 1853. Allen's Encyclop Mat. Med. Vol. IV, 385.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Gelsemium Sempervirens in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

GERANIUM MACULATUM
(Gern. mac.)

Botanical name : *Geranium maculatum* Linn. **Family**: Geraniaceae

Common names : *English*: Wild or spotted Cranes bill, Alum roots; *French*: Piedde-cornielle; *German*: Flechstorch-schnable Wurzel.

Description : Perennial from a thick rootstock, pubescent, with spreading or restores hairs, erect, simple or branching above, 30 to 60 cm high. Basal leaves long petioled, nearly orbicular, broadly cordate or reniform, 8 to 12 cm wide, deeply 5 to 3 patrite, division obovate, stem leaves opposite shorter-petioled, otherwise similar to basal ones; peduncles 1 to 5 elongated, generally bearing a pair of leaves at the base of umbellate inflorescence; ultimate pedicels 2.5 to 5 cm long; flowers rose purple, 2.5 to 4 cm broad; sepals villous ciliate; petals wooly at the base; carpels pubescent; seed reticulate.

Macroscopical : Usually simple, occasionally branched, horizontal, tuberculated upto 10 cm long and 3 to 15 mm broad; externally dark purple or reddish-brown, the upper surface with circular stem scars and buds, the lateral surfaces and lower surface nodulated and annulated; fracture short and nearly even; internally showing the thin bark, a distinct pith.

Microscopical : Transection shows a cork of about 10 rows tangentially elongated cells. Cork cambium of thin-walled more or less collapsed cells. Cortex composed of an outer zone of 5 layers of tangentially-elongated oval cells and broad inner zone of nearly isodiametric cortical parenchyma, tissue containing starch grains and calcium oxalate. A circle of a few small fibro-vascular bundles whose intrafascicular cambium joined by inter-fasicucler cambium into a closed cambium ring. In Medullary region on the outside of each interfascicular cambium, a patch of soft bast is developed but no accompanying xylem on the inner face of the interfascicular cambium is present. Pith, a large central cone of nearly isodiametric cells, containing either starch grains, aggregate of calcium oxalate or tannin masses.

Habitat : North America, found in open fields and woods.

History and authority : It is introduced in Homoeopathy by Dr. Beckwith in 1870. O. Med. and Surg. Rep. IV, 127. Allen's Encyclop. Mat. Med. Vol. IV, 407.

Part used : Root. Moisture content of the fresh root is 200 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Geranium Maculatum in *coarse powder*	100 g
Purified Water	400 ml

Strong Alcohol 635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

GRAPHITES
(Graph.)

Common names : *Carbo mineralis, Cerussa nigra, Plmubago,* Black lead; *French*: Graphite; *German*: Reisblei.

Description : A blackish-grey, soft, unctuous, lustrous solid composed of hexagonal crystalline scales; odourless. Specific gravity 2.00 to 2.5 and is a good conductor of electricity. Next to diamond it is the purest form of mineral carbon and occurs in nature.

Loss on heating : Not more than 1.25 percent w/w.

Water soluble matter : Not more than 1.25 percent w/w.

Determination of Ash : Weigh accurately about 2 g of the material in a tared platinum dish and incinerate till the residue in the crucible is constant in weight. Cool in a desiccator and weigh. Ash by weight, shall not be more than 5 percent.

History and authority : First idea of using this substance as a drug is of S. Swinhold. Ruggieri used it later internally as well as externally. Allen's Encyclop. Mat. Med. Vol. IV, 467.

Preparation : (a) Trituration 1x — Drug strength 1/10

Graphites in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

GYMNEMA SYLVESTRE
(Gymn. syl.)

Botanical name : *Gymnema sylvestre* R. Br. **Family**: Asclepiadaceae

Common names : *Hindi*: Merasingi, Meshashringi, Kavali, Podapatri.

Description : A large or more or less pubescent climbing shrub; young stem and branches terete, pubescent. Leaves sub-coriaceous, 2.5 to 6 cm long, elliptical or ovate, acute or shortly acuminate, cuneate rounded or cordate at the base, often glabrous above, more or less pubescent beneath, especially on the veins; petioles 6 to 12 mm long. Flowers yellow, in umbellate cymes, peduncles shorter than the petioles, densely tomentose; pedicles slender. Calyx 4 to 8 mm long, pubescent, deeply divided; lobes 2 mm long, oblong, obtuse; corolla 4 mm across; lobes glabrous, about as long as the companulate tube, triangular, obtuse. Corolla lobes protruded beyond the sinuses of the corolla lobes. Anthers white, style-apex axserted. Follicles 2.5 to 7.5 cm long, glabrous, lanceolate, tapering into a beak. Seeds 12 mm long, narrowly ovoid-oblong, flat and broadly margined, pale brown.

Habitat : Found in deciduous forest of sub-Himaayan regions, Central and Southern India.

History and authority : A dictionary of Practical Mat. Med. Clarke Vol. I, 859.

Part used : Leaves.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Gymnema Sylvestre in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong alcohol in sufficient quantitiy	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. IX

HAMAMELIS VIRGINICA

(Ham. Virg.)

Botanical name : *Hamamelis virginica* Linn. **Family**: Hamamelideaceae

Synonyms : *Hamamelis androgyna* Walt., *H. corylifolia* Moench., *H. dioica* Walter, *H. macrophylla Pursh, Trilopus dentate* Raf., *T. nigra* Raf., *T. rotundifolia* Raf., *T. virginica* (L.) Raf.

Common names : *English*: Witch hazel, Striped or spotted older; *French*: Hamamelish; *German*: Hamamellas, Zamberhasel.

Description : A deciduous shrub, upto 5 meter high with numerous long flexuous, forking branches, with smooth, brown bark, becoming greyish and fissured with age. Leaves 7 to 15 cm long, obovate or oval, straight veined, wavy dentate, somewhat downy when young, becoming smooth with age. Flowers yellow, in small axillary heads, usually surrounded by a scale like, three leaved involucre.

Microscopical : The diagnostic characters of the bark are: The characteristic stellate trichomes, consisting of 4 to 12 cells united at the base; the epidermal cells with wavy anticlinal walls; the large prisms of calcium oxalate in the endodermis; the large lignified slightly branched idioblasts.

Habitat : Indigenous to U.S.A. and Canada.

History and authority : Introduced in Homoeopathic practice 1851 by Dr. Preston. Allen's Encyclop. Mat. Med. Vol. IV, 528.

Part used : Stem Bark and also the bark of the root. Moisture content of the fresh bark of the root 150 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Hamamelis Virginica in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water, six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III.

Revised Monograph Appeared in HPI Vol. X

HELLEBORUS NIGER
(Hell. nig.)

Botanical name : *Helleborus niger* Linn. **Family**: Ranunculaceae

Synonyms : *Elleborum nigrum, Helleborus grandiflorus* Salisb., *Veratrum nigrum* Salisb.

Common names : *Hindi*: Khorasani kutki; *English*: Black hellebore, Christmas rose; *French*: Ellebore noir; *German*: Sohwarze Uieswurzel.

Description : A perennial, having brownish-black, knotted, brittle, fleshy rhizome, 2.5 to 7.5 cm long, 6 to 12 mm thick. Leaves on long stalks, which spring directly from the root. Stalks are cylindrical, tapering, smooth, shinning and pale green, mottled with red. Leaves pedate, deeply divided into several nearly separate lobes, coarsely seriate in the upper part, dark green above, paler beneath. Flowers on a scape shorter than petiole, at first pinkish-white, becoming green.

Macroscopical : The drug occurs in irregularly branched, blackish pieces from 3.0 to 6.0 cm in length and from 5 to 8 mm in diameter. The branches show encircling leaf scars and the remains of the aerial stem or buds.

Microscopical : Transverse sections of the rhizome shows considerable variations, 4 to 12 or more vascular bundles often of widely different shapes.

Habitat : Found in alpine regions.

History and authority : Introduced by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. IV, 547.

Part used : Rhizome. Moisture content of fresh rhizome 200 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Helleborus Niger in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contain one part tincture, three parts purified water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class IV.

Revised Monograph Appeared in HPI Vol. X

HEPAR SULPHUR
(Hep. sul.)

Chemica Symbol : CaS

Common names : Hepar sulphuris calcareum, Liver of sulphur, Impure calcium sulphide; *French*: Foie de sourfre calcaire; *German*: Schwefelleber.

Description : A white, porous, friable mass or a white amorphous powder; odour and taste of sulphuretted hydrogen. It is insoluble in cold water or strong alcohol; soluble in hot hydrochloric acid with evolution of hydrogen sulphide. It is prepared according to Hahnemann's directions: Mix equal weight of clean and finely powdered oyster shells and well-mashed flowers of sulphur, placing them in a hermetically closed clay crucible, keeping mixture at a white heat for at least ten minutes. The product is to be cooled and pulverised.

Identification : It responds to all the *reactions* characteristic of calcium and sulphides.

Storage : Preserve in well-closed glass stoppered bottles and protect from light.

History and authority : In 1794 Hahnemann used this drug internally to remove the bad effects of intake and topical application of mercury, the use of which was very common. Allen's Encycop. Mat. Med. Vol. IV, 572.

Preparation : (a) Trituration 1x — Drug strength 1/10

Hepar Sulphur in coarse white amorphous powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

HOLARRHENA ANTIDYSENTERICA

(Hol. andy.)

Botanical name : *Holarrhena antidysenterica* Wall. **Family**: Apocynaceae

Common names : *Hindi*: Kurchi, Kawar, Kura.

Description : A small, deciduous tree, with brown bark exfoliating in irregular flakes. Leaves sessile of nearly so, rather thin glabrous or more or less tomentose, especially beneath, broadly ovate or elliptic rounded or tapering at base, main lateral nerves conspicuous, connected by prominent transverse veins. Flowers white, arranged in the terminal cymes, pedicles slender; bracts small, deciduous; calyx lobes 2.5 to 3 mm long, lanceolate, acuminate ciliate; corolla about 2.5 cm in diameter, creamish, puberulous outside; tube 8 to 12 mm long; throat without a ring of hairs, lobes about as long as tube, oblong obtuse. Follicles slender 20 to 35 cm long; seeds, linear about 12 mm long, brown, about twice as long as the seed. The heart wood is not distinct. The wood is lusterous, straight-and, closed-grained, fine-and even textured, moderately soft and light. The oil extracted from seeds gives a penetrating odour and mild taste.

Macroscopical : Small recurved pieces of varying size and thickness, outer surface buff to brownish, longitudinally wrinkled and bearing horizontal lenticels, inner surface brownish, rough and scaly. Fracture short and granular.

Microscopical : Cork consists of 4 to 12 rows tangentially elongated cells, radial 15 to 45 tengently or 30 to 60. Phellogen consists of a row of thin-walled tangentially elongated cells. Phelloderm usually wide parenchymatous interspersed with strands of stone cells. Stone cells are rectangular to ovate bearing numerous pits and often containing prismatic crystals of calcium oxalate. Non-lignified pericyclic fibres are present in bark, upto 5 mm thick. Secondary phloem is wide, consisting of sieve tubes, companion cells, phloem parenchyma and stone cells; stone cells in tangential rows in a concentric manner associated with crystal sheath containing prisms. Medullary rays are mostly bi or tri-seriate, rarely uniseriate, becoming wide towards the outer part and consist of thin-walled radially elongated parenchymatous cells.

Habitat : Common throughout India.

History and authority : Drugs of Hindoostan by Dr. S. C. Ghose. Proved at Midnapore, Drug proving Research Centre, Midnapur, West Bengal.

Part used : Dried Bark.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Holarrhena Antidysentrica in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	600 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six part *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IX

HYDRASTIS CANADENSIS

(Hydr. can.)

Botanical name : *Hydrastis canadensis* Linn. **Family**: Ranunculaceae

Synonym : *Warneria canadensis* Mill.

Common names : *English*: Eye balm, Golden seal; *French*: Sceaud`or; *German*: Canadesche Gelbwurzel.

Description : A deciduous, perennial herb, having a thick, knotted, horizontal, bright yellow rhizome, with slender roots beneath. Stem simple, erect, 15 to 30 cm high, sub-cylindrical, with downward-pointed hairs. Two alternate leaves near the top, the lower petiolate, upper sessile. Flower, small, terminal, greenish white, apetalous.

Macroscopical : Rhizome small, yellowish brown and tortuous from 1 to 6 cm long and from 3 to 12 mm thick, wrinkled longitudinally, marked by encircling scale-leaf scars and bearing frequent, short, upright branches terminated by cup shaped scars left by the aerial stems; all parts of the surface bearing numerous brittle, curved, wiry roots, which often become partly or wholly broken off leaving short protuberances or circular, yellow scars; rhizome hard and breaking with a resinous fracture; transversely cut surface varying in colour from dark yellow to dark yellowish-brown and exhibiting a comparatively thick bark, a large pith and a ring of about 12 to 20 bright yellow somewhat distant, narrow, xylem bundles from some of which traces pass through the cortex of the roots and leaves.

Microscopical : The diagnostic characters are: abundant parenchymatous tissue containing numerous simple and a few 2 to 6 compound starch grains, upto 15 µ in diameter; fibres and small lignified, pitted vessels of the xylem, brown, polyhedral, tabular-celled cork; calcium oxalate and stone cells absent; a section immersed in nitric acid shows needles of berberin nitrate precipitated in fluid.

Habitat : Canada and the United States.

History and authority : Allen’s Encyclop. Mat. Med. Vol. IV, 613.

Part used : Rhizome. Moisture content of fresh rhizome 233 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Hydrastis Canadensis in *coarse powder*	100 g
Purified Water	400 ml

Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

HYDROCOTYLE ASIATICA

(Hodro. as.)

Botanical name : *Centella asiatica* (Linn.) Urb. **Family**: Umbelliferae (Apiaceae)

Synonym : *Hydrocotyle asiatica* Linn.

Common names : *Hindi*: Brahami; Mundukparni; *English*: Thick-leaved pennywort; *French*: Hydrocotyle; *German*: Wassernabel.

Description : A prostrate, perennial, faintly aromatic herb. Leaves 1.25 to 4 cm long petioled, reniform or orbicular crenate and often lobed, glabrous or nearly so and shining; stipules adnate to petioles. Peduncles much shorter than the leaves. Bracts small, ovate imbracing the flowers, not scattered among the pedicles. Flowers 3 to 6 in each head, sessile. Petals minute, ovate, acute, slightly imbricate. Fruit 4 to 6 mm, carpels oblong, sub-cylindric curved, much longer than broad; slightly compressed reticulate-rugose, each with 9 curvilinear ridges and within the commissure; pericarp thickened, woody white.

Microscopical : A transverse section of the leaf shows a dorsiventral structure. The upper epidermis is covered with cuticle. Stomata are present on both surfaces and are of rubicaceous type. Palisade tissues can be distinguished into two regions. The spongy parenchyma consists of about 3 layers of parenchymatous cells with intercellular spaces. A transverse section through midrib region shows that epidermal cells on the dorsal side are cubical below with 2 to 3 layers of collenchymas cells on both sides are prominent. Next to this region, there are 4 to 5 layers of parenchymatous cells which do not contain chloroplastids. The vascular bundle is differentiated into xylem, towards ventral side and phloem towards dorsal side. The petiole in transverse section shows epidermis covered by cuticle and its inner walls adjoining cortex are much thickened. Epidermis is followed by a ring of collenchymatous with many intercellular spaces. Seven vascular bundles lie in the parenchymatous region, two of which are less developed and lie in projecting arms of the petiole.

Habitat : Very common at moist places (along river banks etc.) in India.

History and authority : Dr. Andouit after doing a proving in 1857, introduced in Homopathic literature. Allen's Encyclop. Mat. Med. Vol. IV, 625.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Hydrocotyle Asiatica in moderately *coarse powder*	100 g
Purified Water	300 ml

Strong Alcohol 730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water, seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class IV

Revised Monograph Appeared in HPI Vol. X

HYOSCYAMUS NIGER
(Hyos. nig.)

Botanical name : *Hyoscyamus niger* Linn. **Family**: Solanaceae

Common names : *Hindi*: Khurasani-ajvayan; *English*: Black henbane; *French*: Jasquiame; *German*: Bilsenkraut.

Description : A coarse herb, clothed with viscid hairs, annual or usually biennial, up to 0.5 meter height, with fusiform roots. Leaves oblong, 5 to 8 cm long, irregularly sinute toothed or pinnatifid, the lower petiolate and the others more or less clasping and simple, one sided; terminal spikes; Corolla greenish-yellow, purple-veined; capsule about 1.25 cm long, enclosed in the enlarging calyx. The seeds are more or less odourless and are slightly bitter to taste. They contain an amber-coloured oil.

Microscopical : Leaf: trichomes numerous, particularly above and below main veins and glands each with a uniseriate stalk of 2 to 6 cells and upto 500 µ long and a large oval, multicellular head. Epidermis consisting of cells with sinuous anticlinal walls and smooth cuticle. Stomata, about 125 per Sq. mm in the adaxial epidermis more frequent in the abaxial epidermis. Mesophyll with a single layer of palisade cells. Single or twined prismatic crystals about 5 to 20 µ long or a cluster crystal of a few components in each of a number of collecting cells, forming a crystal layer; microsphenoidal crystals present in occasional idioblast adjoining the veins. Midrib, with the adaxial epidermis often separated, containing an arc of several bicollateral vascular bundles and no collenchymas except as a bundle sheath. Stem with trichomes as in the leaf; cortical collenchyma upto 10 cells thick, an endodermis containing starch, small strands of primary phloem, a pericyclic fibres; secondary phloem without fibres; secondary xylem as continuous cylinder consisting of xylem fibres with linear pits and annular, spiral or reticulate vessels, internal phloem in a network showing as isolated strands in transverse section. Calyx with trichomes and stomata as in leaf. Corolla with trichomes on the outer epidermis especially on the lower veins, inter epidermis glabrous; veins with spiral trachieds and cells containing bluish anthocyanin. Anthers with conspicuous thickened bands in the endothecium.

Habitat : In India, found from Kashmir to Garhwal in Himalayas. Europe and America.

History and authority : Introduced by Homeopathic practice by Hahnemann in 1805. Allen’s Encyclop. Mat. Med. Vol. V, 25.

Part used : Whole plant of second year's growth. Moisture content of fresh plant 450 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Hyoscyamus Niger in moderately *coarse powder*	100 g
Purified Water	450 ml
Strong Alcohol	585 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water, five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I

Revised Monograph Appeared in HPI Vol. VIII

HYPERICUM PERFORATUM
(Hyper.)

Botanical Names : *Hypericum perforatum* Linn. **Family**: Hypericaceae

Synonyms : *Fuga daemonum, H. umbelicalis, H. officinale* Gater ex Steud, *H. pseudo perforatum* Bertol, *H. virginicum* L., *H. vulgare* Lam.

Common names : *Hindi*: Bassant; *English*: John's wort; *Franch*: Millepertuis; *Garman*: Johannis Kraut Hartheu.

Description : A perennial herb, with woody branches, dark brown root. Stem 30 cm or more in height, much branched, producing runners from the base, somewhat 2 edged and smooth. Leaves opposite, entire, oblong, punctuate, with numerous scattered pellucid dots; flowers deep yellow, in terminal, open leafy cymes. The herb has a characteristic balsamic odour and a bitter, resinous, somewhat astringent taste.

Habitat : India (Himalayan region), Asia, Europe, North Africa and North America.

History and authority : Dr. Mueller, proved this drug and then introduced into Homoeopathic practice in 1837. Allen's Encyclop. Mat. Med. Vol. V, 53.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Hypericum Perforatum in moderately *coarse powder*	100 g
Purified Water	250 ml
Strong Alcohol	780 ml

to make one thousand mililitres of the Mother Tincture

(b) Potencies: 2x to contain one part tincture, two parts Purified Water, seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III

IGNATIA AMARA
(Ign.)

Botanical name : *Strychnos ignatia* Berg. **Family**: Loganiaceae

Synonyms : *Faba febrifuga* Geoffer, *F. indica* Forssk.

Common names : *English*: St. Ignatius' bean; *French*: Feve de Saint Ignace; *German*: Ignazbohne.

Description : A small tree. Stem erect, branches opposite, glabrous. Leaves petiolate, ovate, opposite, acute, 12.5 to 18 cm long. Flowers numerous, white, long, in small axillary panicles, having the odour of jasmine. Fruit pear shaped, having seeds 20 to 24, imbedded in a bitter pulp. Seeds are having a shape like as almond but irregular, apparently from compression while soft, blackish-grey or clear brown in colour with a brownish horny, translucent shell, very hard and difficult to split, appearing glabrous, but having fined down, odourous, with a lasting bitter taste.

Macroscopical : Beans are heavy, hard, angularly ovate with obtuse angles, from 20 to 30 mm in length and about 15 mm in breadth and thickness, externally greyish or reddish-black, nearly smooth with few or no hairs, fracture granular and translucid in small fragments, a small irregular cavity in centre.

Microscopical : Greyish-brown, exhibiting thin cells of epidermis and subjacent layer of seed coat, polygonal cells with thickened pitted walls; hairs characteristic, spreading and thickened base and heavy linear markings; endosperm tissue, outer cells small, contents granular, inner larger, with thickened walls, lumen irregular in size and shape.

Habitat : Found in Philippine-islands and China.

Part used : The bean.

History and authority : Introduced in Homoeopathic practice by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. V, 66.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ignatia Amara in fine powder	100 g
Purified Water	150 ml
Strong Alcohol	870 ml

to make one thousand millilitres of the Mother tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration: 1x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Class IV (Dilution).

IODIUM
(Iod.)

Chemical symbol : I **At. wt.**: 126.904

Common names : Iodum, Iodinium; *French*: Iode; *German*: Jod.

Description : A heavy, greyish-black, brittle, rhombic prisms or granules with a metallic lustre; odour, characteristic. It is slightly soluble in water and in 12.5 parts of alcohol. Its specific gravity is 4.93. It is chiefly obtained from the ashes of the sea-weeds. Contains not less than 99.5 percent of I.

Identification : (i) The colour of its solution in *chloroform, carbon tetrachloride* or *carbon disulphide* is violet

(ii) When gently heated, it gives off violet-coloured vapour, which condenses, forming a bluish-black crystalline sublimate.

(iii) It gives a deep blue colour with a solution of *starch* containing some *potassium iodide*. The colour vanishes when the mixture is boiled, but re-appears on cooling.

Non-volatile matter : Leaves not more than 0.05 percent of residue when volatilised on a water bath.

Assay : Weigh accurately about 0.5 g and dissolve in a solution of 1 g of *potassium iodide* in 5 ml of *water*. Dilute to 50 ml with *water*, add 1 ml of *dilute acetic acid*, titrate with 0.1 N *sodium thiosulphate*, using solution of *starch* as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01269 g of I.

Storage : Preserve *Iodine* in an amber glass stoppered bottle or in earthen ware container with a well waxed bung.

History and authority : Allen's Encyclop. Mat. Med. Vol. V, 119.

Preparation : (a) Mother Solution Drug strength 1/100

Iodium in *coarse powder* 10 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x and higher with *Dispensing Alcohol*.

Old method : Class V b.

Revised Monograph Appeared in HPI Vol. X

IPECACUANHA
(Ipecac.)

Botanical name : *Caphaelis ipecacuanha* (Brot) A. Rich **Family**: Rubiaceae

Synonyms : *C. acuminate* Kersten, *C. ametica, Callicocca ipecacuanha* (Brot) A. Rich.

Common names : *English*: Ipecac; *French*: Ipecacuanha; *German*: Brechwurzel.

Description : A half shrubby, perennial plant. Stem up to 1 meter long, partly underground, smooth grey at base, pubescent and green above. Leaves opposite, petiolate, obovate, acute, entire, blackish-green, somewhat rough above, pale downy and veined beneath, 7 to 10 cm long, 2.5 to 5 cm broad with large stipules. Flowers small, white, sessile, in dense head on axillary, but apparently terminal peduncles, surrounded by an involucre of four bracts.

Macroscopical : Root: somewhat tortuous pieces, seldom more than 15 cm long, 0.6 mm thick; from dark brick-red to very dark brown; closely annulated external ridges rounded and completely encircling the root; fracture, short in the bark and splintery in the wood, the smoothed transverse surface showing a wide greyish bark and a small uniformly dense wood. Rhizome short length attached to roots, cylindrical, upto 1 mm in diameter, finely wrinkled longitudinally and with pith approximately one sixth of the whole diameter.

Microscopical : Root: bark consisting of a thin brown cork layer, a wide parenchyma cortex, containing much starch with many compound grains of 2 to 8 components and some simple grains, individual grain rarely more than 15 μ in diameter, also some idioblasts with bundles of raphides; phloem in thin wedges projecting into the parenchyma; xylem, consisting mainly of tracheids with linear pits and small vessels frequently with round lateral perforations and lignified secondary medullary rays, containing starch grains.

Rhizome: Vascular tissue peripheral; pericycle with thick-walled pitted sclereids; protoxylem with spiral vessels. Xylem with fibres having linear slits, medulla with isodiametric lignified cells with rather thin walls.

Habitat : Cultivated in India, Brazil and South America.

History and authority : Introduced into Homoeopathy by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. V, 137.

Part used : Root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ipecacuanha in fine powder	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class I

Revised Monograph Appeared in HPI Vol. X

JANOSIA ASHOKA

(J. ashok)

Botanical name : *Saraca indica* Linn. **Family**: Leguminosae (Fabaceae)

Common name : *Hindi*: Ashok.

Description : A tree 7 to 10 meter high; branches glabrous. Leaves 15 to 20 cm long; rachis glabrous, petioles very short; stipules intra-petiolar, completely united, scarious, ovate-oblong, obtuse, parallel nerved; leaflets 4 to 6 pairs, 10 to 20 cm by 1 to 3 cm, oblong, lanceolate, obtuse or acute, quite glabrous, base rounded or cuneate, slightly oblique; petioles stout, wrinkled, stipules deciduous. Flowers fragrant, numerous, in dense axillary corymbs, 7 to 10 cm across; peduncles stout; pedicel 8 to 12 mm long, red, glabrous; bracts ovate, sub-acute; bracteoles 2, appearing like a calyx, 4 mm long spathulate or oblong, sub-acute, ciliolate, amplexicaul, coloured. Calyx passing from yellow to orange and finally red; cylindric, solid at the base, segments 4, oblong or obovate-oblong, 10 mm long. Petals nil. Stamens 7, filaments filiform, thrice as long as the calyx segments; anthers purple. Ovary pubescent especially on the sutures; style curved. Pod black, 10 to 25 cm by 4 to 5 cm linear-oblong, tapering to both ends, compressed, glabrous veined. Seeds 4 to 8 ellipsoid-oblong, 4 cm long, compressed.

Macroscopical : Bark externally yellowish to greenish, smooth with circular lenticels and transversely ridged, sometimes cracked; internally reddish-brown with fine longitudinal strands and fibres. Fracture splintery, exposing striated surface, a thin whitish and continuous layer is seen beneath the cork layer.

Microscopical : Periderm consists of wide layer of phellem, which are radially flattened, phellogen and short phelloderm. Secondary cortex tissue is deep with one or two continuous layers of the stone cells with many patches of sclerides. Parenchymatous tissue contains yellow masses and prismatic crystals. Secondary phloem consists of phloem parenchyma, sieve tube with companion cells and phloem fibres, which occurs in groups; crystal fibres are also present.

Habitat : Found in evergreen forests of India.

History and authority : Dr. D. N. Roy of Calcutta proved this drug. Drugs of Hindoostan by Dr. S. C. Ghose.

Part used : Bark.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Janosia Ashoka in dried moderately *coarse powder*	100 g
Purified Water	125 ml
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

JUSTICIA ADHATODA
(Just. ad.)

Botanical name : *Adhatoda vasica* Nees. **Family**: Acanthaceae

Synonym : *Justicia adhatoda* Linn.

Common names : *Hindi*: Adulasa, Vasaka.

Description : A dense evergreen, often gregarious shrub, 1 to 2.5 m high. Stem with yellowish bark, terete, glabrous, branches, many ascending leaves 12 to 20 cm long, elliptic-lanceolate, acuminate, tapering to the base, minutely puberulous, dark-green above; pale beneath. Flowers in short dense auxillary preduncled spikes 2.5 to 7.5 cm long, arranged towards ends of the branches; peduncles stout, shorter than leaves; bracts upto 22 mm long, elliptic, sub-acute glabrous or nearly so, 5 to 7 nerved, closely reticulate, bracteoles 18 mm long, 1-nerved, margin ciliate. Calyx 8 to 12 mm long, hairy outside, tube 12 mm long, upper half much inflated laterally, upper lip curved, mottled, lower lip as long as the upper lobes, oblong, rounded. Filaments hairy at the base, the lower anther cells speculate (not spurred) at the base. Ovary and lower position of style hairy. Capsule 18 mm or more in length, clavate, pubescent. Seeds orbicular.

Microscopical : Leaves, in the surface view epidermal cells are sinnuous with caryophyllaceous stomata on both surfaces, more numerous on the lower, clothing trichomes few, 1 to 3 rarely upto 5-celled, thin walled uniseriate upto 500 µ and glandular trichomes with unicellular stalk and 4 celled head; measuring 25 to 36 µ in diameter in surface view, cystoliths in mesophyll layers, elongated and cigar shaped, calcium oxalate crystals in acicular and prismatic forms in mesophyll; palisade ratio, 5 to 6.5 to 8.5, stomatal index, 10.8 to 14.2 to 18.1 for lower surface.

Habitat : Throughout India in plains and in sub-Himalayan tracts ascending upto 1,200 meter.

History and authority : Drugs of Hindoosthan by Dr. S. C. Ghose.

Part used : Leaves. Moisture content of fresh leaves 270 ml per 100 g solids.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Justica Adhatoda, moist magma containing solids 100 g and plant moisture 270 ml	370 g
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

KALI BICHROMICUM
(Kali. bich.)

Chemical symbol : $K_2Cr_2O_7$ **Mol. wt.**: 294.192

Common names : Potassii bichromas, Kali chromicum rubrum, Bichromate of potassium; *French*: Bichromate de potasse; *German*: Kaliumbichromat.

Description : Large, orange-red, transparent, crystals or crystalline powder, odourless, of an acid, metallic taste. It is stable in air. It is soluble in water but insoluble in alcohol. Its aqueous solution is acidic to litmus. It is commonly prepared from chrome iron ore. Contains not less than 99 percent of $K_2Cr_2O_7$.

Identification : (i) An aqueous solution gives a yellow precipitate with *lead acetate* solution, a red precipitate with a *solution of silver nitrate*.

(ii) 1 g dissolved in 20 ml of water and 5 ml of *hydrochloric acid* forms, on the gradual addition of 1 ml of *alcohol*, a green solution.

Aluminium and calcium : 2 g dissolved in 20 ml of water shows no turbidity on making distinctively alkaline with solution of *ammonia* and adding *ammonium oxalate* solution.

Chloride : 2 g complies with *limit test for chlorides.*

Sulphate : 1 g complies with *limit test for sulphates.*

Assay : Dissolve about 0.2 g accurately weighed in 25 ml freshly boiled and cooled *water* in glass stoppered flask, add 2 g of *potassium iodide* and 10 ml of *hydrochloric acid* and allow to stand in the dark for 10 minutes. Add about 200 ml of freshly boiled, cooled water and titrate with 0.1 N *sodium thiosulphate*, using solution of *starch*, added towards the end of the reaction as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.004904 g of $K_2Cr_2O_7$.

History and authority : Allen's Enclycop. Mat. Med. Vol. V 213.

Preperation : (a) Mother Solution — Drug strength 1/10

Kali Bichromicum in granules	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x to be prepared in Purified Water. 4x and higher with *Dispensing Alcohol*.

Old method : Class V B.

Storage : Below 3x fresh prepeartion of this salt should be used and should be discarded if there is discolouration, sedimentation or visible particles.

KALI CARBONICUM
(Kali. carb.)

Chemical symbol : K_2CO_3 **Mol. wt.**: 138.213

Common names : Potassii carbonas, Kalium carbonicum, Carbonate of potassium; *French*: Carbonate de potasse; *German*: Kaliumcarbonat.

Description : A white, granular powder; odourless and hygroscopic, deliquescent in air; odourless having a strong alkaline taste. It is readily soluble in water but insoluble in *alcohol*. Its aqueous solution is quite alkaline. It was originally prepared from the ashes of plants. It is obtained by heating *potassium bicarbonate*, which is obtained by passing carbon di-oxide in the solution of *potassium hydroxide*. Contains not less than 98 percent of K_2CO_3.

Identification : (i) It gives a white, granular precipitate with an excess of *tartaric acid*, which is soluble in dilute mineral acids.

(ii) It responds to the *tests* characteristic of potassium and of carbonates.

Arsenic : Not more than 2 parts per million.

Heavy metals : Not more than 0.6 parts per million.

Iron : Not more than 10 parts per million.

Sulphates : Solution neutralised with dilute *sulphuric acid*, contains not more than 10 parts per million.

Assay : Dissolve 2 g of the dried substance, accurately weighed in 25 ml of *water* and 1 drop of a solution of *methyl orange* and titrate with 1 N *hydrochloric acid* solution until the yellow colour changes to an orange one. Then the solution is heated and boiled for 2 to 3 minutes. After cooling, if the yellow colour reappears, continue titrating until the yellow colour changes to pink. Each ml of 1 N *hydrochloric acid* solution is equivalent to 0.06910 g of K_2CO_3.

Storage : Keep in completely filled and well-closed container**.**

History and authority : Allen's Encyclop. Mat. Med. Vol. V 281.

Preparation : (a) Trituration 1x Drug strength 1/10

Kali Carbonicum in granules	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

KALI IODATUM
(Kali. iod)

Chemical symbol : KI **Mol. wt.**: 166.00

Common names : Potassii iodidum, Kalium iodatum, Iodide of potassium; *French*: Iodure de potassium; *German*: Jodkalium.

Description : A colourless, transparent or somewhat opaque cubes or a white granular powder; slight odour of *iodine*, with a saltish-bitter taste. It is stable in dry air, but hygroscopic in moist air. Its specific gravity is 3.123 and melts at 680°. It is soluble in 0.7 part of water, 0.5 part of boiling water, in 22 parts of *alcohol*. It is prepared by mixing iodine to a solution of potassium hydroxide. Contains not less than 99 percent of KI, with reference to the substance dried to constant weight at 105°.

Identification : (i) An aqueous solution of *potassium iodide* is neutral or slightly alkaline to litmus.

(ii) It responds to the *tests* characteristic of potassium and of iodides.

Arsenic : Not more than 1 part per million..

Iodate : Make a solution of 0.5 g of *potassium iodide* in 10 ml of freshly boiled and cooled water, add a few drops of a solution of *starch* and of dilute *sulphuric acid.* No blue colour appears for half a minute in the test tube.

Loss on drying : Loses not more than 1 percent of its weight when dried to constant weight at 105°.

Assay : Weigh accurately about 0.5 g and dissolve in 50 ml of water in a long necked flask, add 15 ml of *hydrochloric acid* and 6 ml of solution of *potassium cyanide* and titrate with 0.05 M *potassium iodate*, until the dark brown solution formed, becomes pale yellow; add 5 ml of solution of *starch* and titrate slowly until the liquid becomes colourless. Each ml of 0.05 M *potassium iodate* is equivalent to 0.0166 of KI.

Storage : Keep potassium iodide in a well-closed container.

History and authority : Allen’s Encyclop. Mat. Med. Vol. V, 331.

Preparation : I (a) Mother Solution — Drug strength 1/10

Kali Iodatum in granules	100 g
Purified Water	400 ml
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

II (a) Trituration 1x	Drug strength 1/10
Kali Iodatum in granules	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Class VI-B (Tincture),

KALI MURIATICUM

(Kali mur.)

Chemical symbol : KCl **Mol. wt.**: 74.555

Common names : Potassi chloridum, Kalium chloridum, Chloride of Potassium; *French*: Chlorure de potassium; *German*: Kaliumchlorid.

Description : A colourless, elongated, prismatic or cubical crystals or as a white granular powder; odourless and a saline taste. It is stable in air. Its specific gravity is 1.988 and melts at 772°. It is soluble in 2.8 parts of water, in 2 parts of boiling water; insoluble in alcohol. It is commonly obtained from natural sources and is also prepared by mixing *potassium carbonate* and *hydrochloric acid*. Contains not less than 99 percent of KCl.

Identification : (i) A solution of *potassium chloride* responds to the *tests* characteristic of potassium and of chlorides.

Reaction : 5 g dissolved in 50 ml of freshly boiled and cooled *water*, requires not more than 0.5 ml of 0.01 N *sodium hydroxide* or 0.01 N *hydrochloric acid* for neutralisation to solution of *phenol red*.

Assay : Weigh accurately about 0.25 g, dissolve in 50 ml of *water* and titrate with 0.1 N *silver nitrate*, using solution of *potassium chromate* as indicator. Each ml of 0.1 N *silver nitrate* is equivalent to 0.007456 g of KCl.

History and authority : Dr. Schussler introduced this salt in Homoeopathy. A Dictionary of Practical Mat. Med. Clarke Vol. II,140.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Muriaticum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Class VII

KALI PHOSPHORICUM

(Kali. phos.)

Chemical symbol : K_2HPO_4 **Mol. wt.**: 174.183

Common names : Potassii phosphas, Kalium phosphoricum, Phosphate of potassium; *French*: Phosphate de potasse; *German*: Phosphorsaures Kali.

Description : A colourless or white granules or powder; taste saline. It is hygroscopic in moist air. It is soluble in 3 parts of water; very slightly soluble in *alcohol*. It is prepared by the neutralisation of phosphoric acid with potassium carbonate. Contains not less than 98 percent of K_2HPO_4 with reference to substance dried to constant weigh at 105° for four hours.

Identification : (i) A solution of potassium phosphate responds to the *reactions* characteristic of potassium and phosphates.

(ii) Dissolve 2 g in 50 ml *water*, boil for 5 minutes, cool to about 25° and add 3 drops of solution of phenolphthalein; a red colour is produced which disappears on addition of 1 ml of 0.1 N *hydrochloric acid*.

On drying : When dried to constant weight at 105° loses not more than 5.0 percent of its weight.

Assay : Dissolve about 3 g accurately weighed, in 100 ml of water and titrate with 0.5 N *sulphuric acid*, using *bromo-cresol green* as indicator and titrating to the green colour indicative of pH 4.5. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.08709 g of K_2HPO_4.

History and authority : Proving of this has been published by H. C. Allen in Med. Adv. XXVIII 194. Dr. Schussler introduced this salt.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Phosphoricum in granules	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

KALI SULPHURICUM

(Kali. sul.)

Chemica Symbol : K_2SO_4 **Mol. wt.**: 174.266

Common names : Potassii sulphas, Kalium sulphuricum, Tartarus vitriolatus, Sulphate of potassium, Potassium sulphate; *French*: Surfate de potasse; *German*: Kalium sulfat.

Description : A colourless, hard, transparent prisms or a white powder; odourless; having a sharp, bitter, saline taste. It is stable in air. It is soluble in 8.3 parts of water, in 4 parts of boiling water, insoluble in *alcohol.* It is prepared by reacting potassium carbonate and sulphuric acid. Contains not less than 99 percent of K_2SO_4 dried to constant weight at 105°.

Identification : A solution of *potassium sulphate* responds to the *tests* characteristic of potassium and of sulphates.

Reaction : An aqueous solution is neutral to litmus paper.

Loss on ignition : When ignited loses not more than 1.0 percent of its weight.

Assay : Weight accurately about 0.5 g of the drug, dried to contant weight at 105°, dissolve in 100 ml of *water*, add 1 ml of *hydrochloric acid*, heat to boiling. Add slowly a slight excess of hot solution of *barium chloride* and heat for half an hour on a water bath; collect the precipitate, wash and ignite to constant weight. Each g of the residue is equivalent to 0.7465 g of K_2SO_4.

History and authority : Dr. Schussler introduced this salt. Allen's Encyclop. Mat. Med. Vol. V, 387.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Sulphuricum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

KREOSOTUM

(Kreos.)

Common names : *English*: *Creosote, Kreosote; French*: Creosote; *German*: Kreosot.

Description : Creosote, a product of the distillation of wood tar, consists of a mixture of phenols; chiefly guaiaol; cresol; methyl cresol and phenol. An almost colourless or yellowish, highly refractive, oily liquid, penetrating, smoky odour and a burning, caustic taste. Its specific gravity is not less than 1.076. It is slightly soluble in water; miscible with *alcohol,* with fixed and volatile oils. It is commonly obtained from *pyroligneous acid*, a product from distillation of wood, preferably beech wood. Not less than 95 percent distils between 200° and 230°.

Identification : (i) To a saturated solution in *water*, add 1 drop of solution of *ferric chloride*, a transient blue colour is produced. With the addition of few more drops of *ferric chloride*, the liquid becomes cloudy and the colour rapidly changes to dingy brown with the formation of a brown precipitate.

(ii) When mixed with an equal volume of collodion in a dry test tube, no permanent coagulum produced.

Storage : Preserve Kreosotum in a well-closed container, protected from light.

History and authority : Allen’s Encyclop. Mat. Med. Vol. V, 408; X 569.

Preparation : (a) Mother Solution — Drug strength 1/10

Kreosotum	100 ml
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher with *Dispensing Alcohol*. Potencies up to 6x to be prepared freshly.

LACHESIS
(Lach.)

Zoological Name : *Crotalus mutus* (Lach) **Family**: Crotalidae

Synonym : *Lachesis mutus* Daudin, 1803.

Common names : Surukuke or Churukuku, Deadly bush master.

Description : The lachesis or bush-master inhabits the hot countries of South America; it attains a length of upward of 7 feet and its poison fangs are nearly 1 inch long; the skin is reddish-brown, marked along the black with large rhomboidal spots of blackish-brown colour, each of which encloses 2 spots of colour of body. The poison resembles saliva, is less viscous, limpid, inodourous, without any marked taste, in colour somewhat greenish at the extremity of the fang; it easily forms into drops and falls without threading; exposed to the air it soon concentrates into a dry, yellow mass, which for an indefinite time preserves its poisonous qualities. This poison introduced into wound or injected into vein, produced the most dreadful symptoms and generally death. Virus of this serpent has been more carefully proved than that of any other. Specimen used by Dr. Hering in his experiments was obtained from living snake which was stunned with a blow; poison was collected on sugar by pressing poison fang upwards against bag and 3 first attenuations prepared by trituration.

Part used : Venom.

Storage : It should be stored in Glycerin.

History and authority : Introduced and proved by Dr. Hering in 1828. Allen's Encyclop. Mat. Med. Vol. V, 432.

Preparation : (a) Trituration 1C Drug strength 1/100

Lachesis venom collected as directed	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Class VIII

Caution : Not to be prescribed below 6x.

Revised Monograph Appeared in HPI Vol. X

LEDUM PALUSTRE
(Led. pal.)

Botanical name : *Ledum palustre* Linn. **Family**: Ericaceae

Synonyms : *Ledume decumbens* (Aiton) Lodd. ex Steud., *L. silesiacum, Anthos sylvestris, Rosmarinum sylvestre.*

Common names : *English*: Wild Rosemary, Marsh cistus; *French*: Rosmarin Sauvage; *German*: Wilder Rosmarin.

Description : An evergreen shrub, upto 1 meter in height, with several clustering rounded branches, covered with a rust coloured fur; stem-bark ash coloured. Leaves 5 cm long, 8 to 12 mm broad, alternate, short petioled, lanceolate, rolled back on edges, glabrous, green and shinning above, red, rust-coloured and downy below. Flowers in dense terminal corymbs, with filiform, pubescent pedicles, white or pale rose red colour. The plant is having heavy aromatic odour and a camphoraceous bitter taste.

Habitat : Found in Northern Europe, Asia, New Foundland, Labrador to Alaska and Aleutian Island.

History and authority : Introduced and proved by Hahnemann in 1805. Allen's Encyclop Mat. Med. Vol. V, 531.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ledum Palustre in *coarse powder*	100 g
Purified Water	185 ml
Strong Alcohol	840 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Old method : Class III

LYCOPODIUM CLAVATUM
(Lyco.)

Botanical name : *Lycopodium clavatum* Linn. **Family**: Lycopodiaceae

Common names : *Hindi*: Bendarli; *English*: Club moss; *French*: Soufre Vegetal; *German*: Barlappsamen.

Description : A perennial, evergreen club-moss, with a trailing branching stem, several meter long and thickly beset with linear-awl-shaped, flat, ribless, smooth leaves, tipped with fine bristle, curved upward and of a light green colour. The fructification is in terminal spikes, single or in pairs, with crowded, ovate, entire pointed scales, bearing in axil a transversely oval sporangium, which splits nearly to base and contains the narrow reticulate spores. Spores are pale yellow and form very mobile powder. Spores odourless and tasteless.

Microscopical : Each spore is covered by an internal thin intine and an external considerably thick exine with a germ pore. When the spores are crushed the ruptured spores yield small drop of fixed oil. Spores very uniform in shape and size, maximum width from 21 to 30 µ, being most commonly about 25 µ, each spore having the shape of triangular pyramid with a convex base being the fourth part of sphere divided by plane surfaces radiating from its centre; convex surface covered with a fine network of raised ridges, the meshes being 4 to 6 sided; 3 flat, triangular surfaces have a similar network near the bases, but are smooth nearly towards apex, strong ridges lines mark of union of flat faces.

Habitat : Found from Kumaon Eastwards in Bengal, Sikkim, Assam, Khasi, Khushai hills, Manipur and in Western Ghats of India. Also in Europe and U.S.A.

History and authority : Introduced into Homoeopathic practice after proving in 1828 by Hahnemann. Allen's Encyclop. Mat. Med. Vol. VI, 1.

Part used : The spores.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Lycopodium Clavatum (spores crushed) 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV

MAGNESIA CARBONICA

(Mag. carb.)

Chemical symbol : $(MgCO_3)_4\ Mg(OH)_2.5H_2O$ **Mol. wt.**: 485.74

Common names : Magnesii carbonas, Magnesium carbonicum, Carbonate of Magnesium; *French*: Carbonate de magnesie; *German*: Magnesium-karbonat.

Description : A light, white, friable mass, odourless with a slight earthy taste. It is stable in air. It is almost insoluble in water and alcohol; soluble with effervescence in dilute acids. It is prepared by boiling dilute aqueous solution of magnesium sulphate and sodium carbonate. It differs from heavy magnesium carbonate in degree of aggregation of their molecules. It is a basic hydrated magnesium carbonate and contains the equivalent of not less than 40 percent and not more than 43.5 percent of MgO.

Identification : (i) A solution in acetic acid responds to the *reactions* characteristic of magnesium and of carbonates.

Arsenic : Not more than 2 parts per million

Chloride : 0.5 g dissolved in water with the addition of 1.5 ml of nitric acid, complies with the *limit test for chlorides.*

Lead : Not more than 10 parts per million.

Sulphate : 0.1 g, dissolved in water with the addition of 3 ml of *dilute hydrochloric acid*, complies with the *limit test for sulphates*.

Soluble matter : Boil 1.0 g with 50 ml of water for five minutes, filter, evaporate the filtrate and dry at 105º, the residue weighs not more than 10 mg.

Assay : Dissolve about 0.5 g accurately weighed, in 25 ml of 1 N *hydrochloric acid solution*. Titrate the excess of hydrochloric acid with 1 N *sodium hydroxide* solution, using *methyl orange* as indicator. Each ml of 1 N *hydrochloric acid* solution is equivalent to 0.02016 g of MgO.

Storage : Preserve in a well-closed container.

History and authority : Allen’s Encyclop. Mat. Med. Vol VI, 85.

Preparation : (a) Trituration 1x — Drug strength 1/10

Magnesia Carbonica in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x,9x and higher with *Dispensing Alcohol.*

MAGNESIA MURIATICA
(Mag. mur.)

Chemical symbol : $MgCl_2.6H_2O$ **Mol. wt.**: 203.303

Common names : Magnesii chloridum, Chloride of magnesium, Magnesium chloride; *French*: Chlorure de magnesium; *German*: Chlor Magnesium.

Description : A white or colourless, hygroscopic crystals; odourless and a bitter, saline taste. It is soluble in 1 part of water and in 2 parts of Strong Alcohol. Its aqueous solution is neutral. It is prepared by evaporating a solution of *magnesium chloride,* obtained by reacting *hydrochloric acid* with magnesia and *ammonium carbonate*. Contains not less than 98 percent of $MgCl_2.6H_2O$.

Identification : It responds to the *reactions* characteristic of magnesium and of chlorides.

Arsenic : Not more than 2 parts per million.

Barium : Dissolve 1.0 g in 10 ml of water and add 1 ml of *dilute sulphuric acid*; the solution remains clear for two hours.

Iron : 4.0 g complies with the *limit test for iron.*

Lead : Not more than 10 parts per million.

Water insoluble matter : Dissolve 5.0 g in *water* to produced 500 ml. The solution is colourless. Filter through a weighed filtering crucible. Wash with water and dry at 105º. The residue weighs not more than 15 mg.

Assay : Dissolve about 0.25 g, accurately weighed, in 50 ml of water and titrate with 0.1 N *silver nitrate,* using solution of *potassium chromate* as indicator. Each ml of 0.1 N *silver nitrate* is equivalent to 0.01017 g of $MgCl_2.6H_2O$.

Storage : Preserve in well-closed containers in dry place.

History and authority : Allen's Encyclop. Mat. Med. Vol. VI, 112.

Preparation : (a) Trituration 1x — Drug strength 1/10

Magnesia Muriatica in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

MERCURIUS CORROSIVUS

(Merc. cor.)

Chemical symbol : $HgCl_2$ **Mol. wt.**: 271.496

Common names : Hydrangyri chloridum corrosivum, Mercurius sublimatus corrosivus, Mercuric chloride, Corrosive sublimate; *French*: Sublime corrosif; *German*: Quecksilberchlorid.

Description : A heavy, white, crystalline mass or rhombic prisms; odourless and of a strong metallic taste. It is soluble in 13.5 parts of water, in 2.1 parts of boiling water; soluble in 3.8 parts of alcohol. When heated to 277º, it changes to a colourless liquid. Its specific gravity is about 5.4. It is commonly prepared by the direct combination of mercury and chloride. Contains not less than 99.5 percent of $HgCl_2$.

Identification : An aqueous solution responds to the *reactions* characteristic of mercuric salts and of chlorides.

Assay : Dissolve in a stopperd flask about 0.3 g accurately weighed in 85 ml of *water;* add 10 ml of solution of *calcium chloride* or 10 ml of *potassium iodide solution,* 3 ml of solution of formaldehyde and 15 ml of *solution of sodium hydroxide*. Shake continuously for 2 minutes, add 20 ml of *acetic acid* and 35 ml of 0.1 N *iodine*. Shake continuously for about ten minutes or until the precipitated mercury is completely redissolved and titrate the excess of *iodine* with 0.1 N *sodium thiosulphate* using starch solution as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.01358 g of $HgCl_2$.

History and authority : Allen's Encyclop. Mat. Med. Vol. VI, 236.

Preparation : I (a) Mother Tincture ϕ — Drug strength 1/10

Mercurius Corrosivus in *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 3x and higher with *Dispensing Alcohol.*

II (a) Trituration 1x — Drug strength 1/10

Mercurius Corrosivus in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

MERCURIUS DULCIS
(Merc. dul.)

Chemical symbol : HgCl **Mol. wt.**: 236.043

Common names : Hydrangyri chloridum mite, Mercurous chloride, Subchloride of mercury, Calomel; *French*: Protochlorure de mercure; *German*: Quicksilberchlorur.

Description : A white, heavy, impalpable powder; odourless and tasteless. It is stable in air, but turns slightly grey, when exposed to light. It is insoluble in water, alcohol and dilute acids. Its specific gravity is 7.1. It is prepared by precipitating a solution of *mercurous nitrate* with *dilute hydrochloric acid* or a solution of *sodium chloride.* Contains not less than 99.6 percent of HgCl.

Identification : (i) It is blackened by contact with dilute *ammonia solution* or with solution of alkali hydroxides.

(ii) When heated with an equal weight of anhydrous sodium carbonate in a test tube, a sublimate of metallic mercury is obtained. The residue in the tube is treated with dilute *nitiric acid*, filtered; the filtrate gives the reactions characteristic of chlorides.

Non-volatile matter : Leaves not more than 0.1 percent of residue, when strongly heated.

Assay : Weigh accurately about 0.7 g and mix with 10 ml of water in a glass stoppered flask, add 50 ml of 0.1 N *iodine* and 5 g of *potassium iodide* dissolved in 10 ml of water. Close the flask and set aside, shaking occasionally until solution complete. Titrate the excess of iodine with 0.1 N *sodium thiosulphate* using a solution of starch as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.02361 g HgCl.

Storage : Preserve in well-closed container protected from light.

History and authority : Allen’s Encyclop. Mat. Med.Vol. VI, 266.

Preparation : (a) Trituration 1x — Drug strength 1/10

Mercurious Dulcis in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

MERCURIUS IODATUS FLAVUS

(Merc. i. f.)

Chemical symbol : HgI **Mol. wt.**: 327.494

Common names : Hydrangyri iodidum flavum, Mercurii iodidum, Yellow mercurous iodide; *French*: Protoiodure de mercure; *German*: Quicksilberjodur.

Description : A strong, yellowish, amorphous powder; odourless and tasteless. It is unstable and decomposes on exposure to light. It is almost insoluble in water and insoluble in alcohol. It is commonly prepared from *mercurous nitrate* and *potassium iodide*. Contains not less than 99 percent of HgI, when dried over *sulphuric acid* for four hours.

Identification : (i) It is blackened by *ammonia water* or solution of alkali and *alkaline-earth hydroxides*.

(ii) It decomposed by solution of *potassium iodide* with the separation of fine globules of metallic mercury. When *chlorine water* is added to this *iodide*, it becomes red and with excess of *chlorine water,* the red precipitate dissolves and iodine is liberated.

Loss on drying : Not more than 2.0 percent.

Assay : Weigh accurately about 1 g, after being dried over sulphuric acid for four hours, transfer to a glass stoppered flask and add 50 ml of 0.1 N *iodine* followed by 5 g of *potassium iodide*, dissolved in 10 ml of *water*. Stopper the flask, allow the mixture to stand with occasional agitation until complete solution has taken place and then titrate the excess *iodine* with 0.1 N *sodium thiosulphate*, using starch solution as indicator. Each ml of 0.1 N *sodium thosulphate* is equivalent to 0.3275 g of HgI.

Storage : Preserve in tight, light resistant containers.

History and authority : Allen’s Encyclop. Mat. Med. Vol. VI, 269.

Preparation : (a) Trituration 1x Drug strength 1/10

Merourous Iodatus Flavus in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

MERCURIUS IODATUS RUBER

(Merc. i. r.)

Chemical symbol : HgI_2 **Mol. wt.**: 454.399

Common names : Hydrangyri iodidum rubrum, Mercurius biniodatus, Mercuric iodide, Red iodide of mercury; *French*: Iodure mercurique; *German*: Quicksilberjodid.

Description : A vivid red, amorphous powder, stable below 127° or yellow rhombic prisms, stable above 127°; odourless and a faint metallic taste. It is practically insoluble in *water*, soluble in 115 parts of *alcohol*. It dissolves in solutions of soluble iodides, mercuric chloride, sodium thiosulphate and in hot solutions of alkali chlorides. Its specific gravity is 6.28 and melts at 250° to a dark red liquid. It is prepared from mercuric chloride and potassium iodide. Contains not less than 99 percent of HgI_2.

Identification : (i) When heated with sulphuric acid and *manganese dioxide*, violet vapours of iodine are liberated, recognisable by the blue colour, it yields with *starch*.

(ii) It responds to all the *reactions* characteristic of mercuric salts and of iodide.

Residue on ignition : Not more than 0.1 percent.

Assay : About 0.5 g accurately weighed, add 10 ml of *water* and 1 g of *zinc powder*, stir well, set aside for 10 minutes. Filter, wash until the washings give no *reaction* of iodides. To the combined filtrate and washings, add 30 ml of 0.1 N *silver nitrate*, 5 ml of *nitric acid* and titrate with 0.1 N *ammonium thiocynate* using *ferric ammonium sulphate* solution as indicator. Each ml of 0.1 N silver nitrates is equivalent to 0.02273 g of HgI_2.

Storage : Preserve in tightly closed, light resistant containers.

History and authority : Allen's Encyclop. Mat. Med. Vol. VI, 282.

Preparation : (a) Trituration 1x — Drug strength 1/10

Mercurius Iodatus ruber in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

MERCURIUS SOLUBILIS
(Merc. sol.)

Common names : Hydrangyrum oxydum nigrum Hahnemanni, Mercury oxide black Hahnemann, Ammoniated nitrate of mercury; *French*: Mercure d Hahenemann; *German*: Hahnemann's Quecksilber.

Description : A heavy, greyish-black powder; taste slightly metallic. It is insoluble in water, alcohol and ether. It is volatilised by heat with decomposition. Contains no metallic globules.

Mercury (by weight)	85 g
Nitric Acid	48 ml
Ammonia strong solution	15 ml
Purified Water in sufficient quantity	

Mix the nitric acid with 235 ml of the purified water in a flask and digest the mercury in mixture, applying a gradually increasing heat until about 70 g of the metal have dissolved and a small portion of the solution diluted with about twenty times its bulk of Purified Water yields a perfectly black precipitate with ammonia. Dilute the hot solution with 350 ml of Purified Water and while warm, filter it into a vessel containing four times its bulk of cold purified water. Having thoroughly mixed the filtrate with the Purified Water, add the solution of ammonia previously diluted with 290 ml of purified water in a thin stream, stirring constantly meanwhile, as soon as the precipitate has subsided, decant the supernatant liquid, shake the precipitate with a fresh portion of purified water, collect it on a filter, wash thoroughly and dry it between folds of filtering paper without the aid of heat.

Storage : Keep in well-stoppered bottles, protected from light.

History and authority : It is a mercurial preparation devised by Hahnemann as a substitute for the corrosive mercurial salts used at his time. Allen's Encyclop.Mat. Med. Vol. VI, 296.

Preparation : (a) Trituration 1x — Drug strength 1/10

Mercurius Solubilis, precipitate	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

MEZEREUM
(Mez.)

Botanical name : *Daphne mezerum* Linn. **Family**: Thymelaceae

Synonyms : *Chamaelia germanica, C. gnidus, Daphne gnidium* L., *Mezerum germanicum.*

Common names : *English*: Mezercon; *French*: Laureole gentile; *German*: Seidelbast.

Description : A deciduous shrub, 1.3 meter in height with smooth grey-bark, easily detachable from wood. Leaves 5 cm long, alternate, petiolate, lanceolate, entire, smooth, green, somewhat glaucous beneath. Flowers fragrant, purplish-rose coloured and is in lateral clusters. The fruit is a berry.

Macroscopical : The bark inflexible, tough, flattened strips or quilled pieces, up to 90 cm in length of variable breadth and up to 10 mm in thickness, outer surface yellowish or olive brown, smooth, showing numerous, circular dark coloured apothecia of lichens; fracture tough, fibrous, the inner bark lamalleted.

Microscopical : Transverse section treated in chloral hydrate solution shows: Cork usually forming a broad zone of 20 to 30 layers of cells outer being compressed and yellowish-brown, the inner being tubular and nearly colourless. Cork-cambium of meristemetic cells. Cortex, the outer 3 to 5 rows of cells of which collenchymatous and contain either chloroplastids or a greenish-yellow resinous substance. Phloems are comparatively broad zone, separated into phloem patches by means of narrow starch containing medullary rays, 1-cell wide. Each phloem patch contains groups of non-lignified bast fibres and sieve strands.

Habitat : Europe, especially in Central countries.

History and authority : Hahnemann introduced this in Homoeopathic practice in 1805. Allen's Encyclop Mat. Med. Vol. VI, 330.

Part used : Bark.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Mezereum in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 mg

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class II

MYRICA CERIFERA

(Myri. cer.)

Botanical name : *Myrica cerifera* Linn. **Family**: Myricaceae

Common names : *English*: Wax-myrtle; *French*: Arbre a'suif; *German*: Wachsbaum.

Description : A slender tree; bark grey, nearly smooth. Leaves narrow, oblong or oblanceolate, mostly acute at the apex, entire or sparingly dentate, narrowest or somewhat cuneate at the base, fragrant when crushed, short petioled, dark green above, paler and sometimes pubescent beneath, golden-resinous, unfolding with or before the aments; staminate aments cylindrical, pistillate aments; shortly oblong; ripe drupes separated, globose, bluish-white, waxy, less than 2.5 cm in diameter, tipped with minute base of style, bracts and bractlets deciduous.

Macroscopical : Bark in pieces of varying length and breadth; usually 2.5 cm or less in length rarely upto 5 mm broad; outer surface either silver-grey, reddish-brown or greyish-brown, scaly in rhizome and root barks, bearing occasional warts or slight ridges; fracture short, weak and uneven; fractured surface brown with short projecting fibres near or along inner border of root bark.

Microscopical : Cork of several layers, irregular, brick-shaped cells, which vary in staining capacity. Many have highly suberised walls but some have all walls lignified, while other shows lignification only on their inner walls. Phellogen of meristmetic cells usually collapsed. Secondary cortex cells are tangentially elongated and smallest in outer most portions, becoming larger as 1 passed towards phloem. Inner layers show numerous air spaces. Endodermis is like those of adjacent cortex. Phloems are comparatively broad zone of irregular phloem patches, medullary rays, often broaden out towards the cortex in fan-shaped fashion.

Habitat : Along the Atlantic Coast from Florida northward. Found in sandy soils and near the seashore. In the South, it is a small evergreen tree, in New Jersy a tall semi-deciduous tree and in the north small dwarf and deciduous.

History and authority : Introduced in Homoeopathy after the proving were published in Trans. Mass. Hom. Med. Soc. II, 397 in 1864. Allen's Encyclop. Mat. Med. Vol. VI, 432.

Part used : The bark of the root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Myrica Cerifera in *coarse powder*	100 g
Purified Water	233 ml

Strong Alcohol 797 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Old method : Class III

NATRUM CARBONICUM

(Nat. carb.)

Chemical symbol : $Na_2CO_3.10H_2O$ **Mol. wt.**: 286.142

Common names : Sodii carbonas, Sodium carbonate; *French*: Carbonate de soude; *German*: Natriumcarbonat.

Description : A white, colourless, rhombic crystals; odourless with a strong alkaline taste. It loses completely its water of crystallisation at about 100°. It is soluble in 1.8 parts of water; insoluble in alcohol. It is prepared by the action of heat on sodium bicarbonate and subsequent crystallization from water. Contains not less than 99 percent and not more than the equivalent of 105 percent of $Na_2CO_3.10H_2O$.

Identification : It responds to the *reactions* characteristic of sodium and of carbonates.

Assay : Weigh accurately about 2 g, dissolve in 20 ml of water and titrate with 0.5 N sulphuric acid, using solution methyl orange as indicator. Each ml of 0.5 N sulphuric acid is equivalent to 0.07154 g of $Na_2CO_3.10H_2O$.

Storage : Preserve in well-closed container.

History and authority : Allen's Encyclop. Mat. Med. Vol. VI, 498.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Carbonicum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

NATRUM MURIATICUM
(Nat. mur.)

Chemical symbol : NaCl **Mol. wt.**: 58.443

Common names : Sodii chloridum, Natrium chloratum, Common salt, Sodium chloride; *French*: Chlorure de sodium; *German*: Chlornatrium.

Description : A colourless, transparent, cubical crystals or a white crystaline powder; odourless with a saline taste. It is stable in air. It is soluble in 2.8 parts of water; slightly soluble in alcohol and insoluble in hydrochloric acid. Its aqueous solution practically is neutral. Its specific gravity is 2.163. It fuses at about 804°. It is found in nature and in its purest form is obtained by passing hydrochloric acid gas into a saturated solution of the salt, thus separating the crystals. Contains not less than 99.5 percent of NaCl.

Identification : (i) A solution of sodium chloride responds to the *tests* characteristic of sodium and chlorides.

(ii) 10 g dissolves completely in 50 ml of water to give a clear solution.

Arsenic : Not more than 1 part per million.

Barium : Dissolve 2 g in 10 ml of *water* and add 2 ml of *dilute sulphuric acid*; the solution remains clear for two hours.

Lead : Not more than 5 parts per million.

Loss on drying : Loses not more than 1.0 percent of its weight when dried to constant weight at 130°.

Assay : Weigh accurately about 0.25 g and dissolve in about 50 ml of *water* and titrate with 0.1 N *silver nitrate* using a solution of *potassium chromate* as indicator. Each ml of 0.1 N *silver nitrate* is equivalent to 0.005845 g of NaCl.

Storage : Preserve sodium chloride in a well-closed container.

History and authority : Allen's Encyclop. Mat. Med. Vol. VI, 528.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrium Muriaticum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

NATRUM PHOSPHORICUM

(Nat. phos.)

Chemical Symbol : $Na_2HPO_4.12H_2O$ **Mol. wt.**: 358.2

Common names : Sodii phosphas, Natrum phosphate, Disodium hydrogen phosphate; *French*: Phosphate de soude; *German*: Natrium phosphat.

Description : A colourless, white prisms or granular salt; odourless having a cooling saline taste; easily effloresces in air and loses 5 molecules of water on exposure to air at ordinary temperature. It is soluble in 4 parts of water; very slightly soluble in alcohol. It is prepared by the interaction of sodium carbonate and phosphoric acid. Contains not less than 99 percent and not more than 105 percent of $Na_2HOP_4.12H_2O$.

Identification : (i) An aqueous solution of the salt is alkaline to *phenolphthalein* (pH about 9.5).

(ii) It responds to the *reactions* characteristic of sodium and of phosphates.

Arsenic : Not more than 2 parts per million.

Chloride : 1.0 g dissolved in *water,* with the addition of 2 ml of *nitric acid* complies with the *limit test for chlorides.*

Lead : Not more than 5 parts per million.

Loss on drying : Loses not less than 57.0 percent and not more than 61.0 percent of its weight when dried to constant weight at 130°.

Assay : Weigh accurately about 6 g and dissolve in 100 ml of *water* and titrate with 0.5 N *sulphuric acid,* using a solution of *bromocresol green* as indicator to the green colour indicative of pH 4.5. Each ml of 0.5 N sulphuric acid is equivalent to 0.1791 g of $Na_2HPO_4.12H_2O$.

Storage : Preserve in a well-closed container.

History and authority : Dr Schussler introduced it into Bio-chemic system of medicine, later on taken into Homoeopathic Mat. Med. Allen's Encyclop. Mat. Med. Vol. VI, 601.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum phosphoricum in granules	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

NATRUM SULPHURICUM
(Nat. sul.)

Chemcial Symbol : $Na_2 SO_4.10H_2O$ **Mol. wt.**: 322.195

Common names : Sodii sulphas, Natrum sulfate, Sodium sluphate, Glauber's salt; *French*: Sulfate de soude; *German*: Glaubersalz.

Description : A colourless, large transparent crystals or granular powder; odourless and have a saline, bitter taste. It effloresces rapidly in air; loses all of its water of crystallisation at 100°. It is soluble in 1.5 parts of *water* but insoluble in alcohol; soluble in glycerin. Its aqueous solution is neutral. It is found in nature and also prepared from sulphuric acid and sodium carbonate. It is also obtained as a byproduct in the manufacture of hydrochloric acid. Contains not less than 99 percent of $Na_2SO_4.10H_2O$.

Identification : It responds to the *reactions* characteristic of sodium and sulphates.

Reaction : 10 g, dissolved in 100 ml of recently boiled and cooled *water*, requires for nutralisation to the green colour of *bromo thymol blue* solution, indicative of pH 7, not more than 0.5 ml of either 0.1 N *sodium hydroxide* or 0.1 N hydrochloric acid.

Arsenic : Not more than 2 parts per million.

Chlorides : 1.0 g complies with the *limit test for chlorides.*

Lead : Not more than 5 parts per million.

Loss on drying : Loses not less than 51.5 percent and not more than 57.0 percent of its weight when dried to constant weight at 105°.

Assay : Weigh accurately about 0.5 g and dissolve in 100 ml of *water* add 1 ml of *hydrochloric acid*, heat to boiling, add slowly a slight excess of hot *solution of barium chloride* solution and heat for half an hour on a water bath; collect the precipitate, wash and ignite to constant weight. Each 1.0 g of the residue is equivalent to 1.380 g of $Na_2SO_4.10\ H_2O$.

Storage : Preserve in tight container and keep in a cool place.

History and authority : Dr. Schussler introduced it into Bio-chemic system of medicine. Allen's Encyclop. Mat. Med. Vol. VI, 611.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Sulphuricum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

NUX MOSCHATA
(Nux. mos.)

Botanical name : *Myristica fragrans* Houtt. **Family**: Myristicaceae

Common names : *English*: Nut-meg; *French*: Le muscadier; *German*: Muskatnuss.

Description : A lofty tree; branches slender. Leaves 7 to 10 cm, coriaceous, elliptic-oblong or lanceolate, acuminate, glaucous beneath, nerves about 8 pairs, slender; petiole 6 to 12 mm Male racemes 2.5 to 5 cm; flower 6 mm long, ellipsoid nodding; bracteole a scale under the glabrate perianth; anthers 9 to 12, connate in a cylindric stipitate column. Fruit ovoid, sub-globose or pyriform, 4 to 5 cm long.

Macroscopical : Seed: Globular, ovoid or ellipsoided, 20 to 30 mm in length, 15 to 24 mm in diam; externally light to dark brown, usually whitish on account of the lime coating, reticulately furrowed and deeply grooved on one side, the groove indicating the position of the raphe; at one end showing a projection in the centre of which is the micropyle; when cut, the exposed surfaces have a mottled appearance because of the ruminate albumen.

Microscopical : Reddish-brown. Under the microscope it shows fragments of perisperm composed of small, thin walled parenchyma cells with brown pigment and few spiral ducts imbedded in which are large reservoirs of volatile oil; fragments of the compound polygonal shaped parenchyma cells, filled with starch and aleurone grains, occasionally brown pigment, starch grains simple or 2 to 20 compound, the individual grains being spheroidal, polygonal or planoconvex from 3 to 22 μ in diam. with distinct hilum.

Habitat : East Indies, West Indies and South America.

History and authority : Introduced into Homoeopathic practice by Dr. Helbig in 1833. Allen's Encyclop. Mat. Med. Vol. VII, 61.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Nux Moschata in *coarse powder* — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV

Revised Monograph Appeared in HPI Vol. X

NUX VOMICA
(Nux. vom.)

Botanical name : *Strychnos nux-vomica* Linn. **Family**: Loganiaceae

Common names : *Hindi*: Kuchla, Muhti; *English*: Poison nut; *French*: Noix vomiques; *German*: Krahenaugen.

Description : A deciduous tree, usually medium sized, but sometimes attaining 30 meter in height, often armed with short axillary spines. Bark thin, grey, smooth, or rough with lenticels. Young shoot polished, deep green. Leaf 7 to 15 cm long, broadly elliptic obtuse or acute, entire, 3 to 6 nerved glabrous and shining, petiole 6 to 12 mm long. Flowers many, greenish-white, in terminal short peduncled, pubescent, compound cymes. Calyx 2.5 mm long, hairy outside, lobes, 5 acute; corolla less than 12 mm long, glabrous or nearly so outside; tube cylindrical, hairy inside towards the base, lobes 5, narrowly oblong, acute; stamens 5, half exerted from the corolla tube, oblong, glabrous; ovary glabrous. Fruit a berry, globose, 2.5 to 7.5 cm in diameter, rough, shining, clothed on both sides with fine silky hairs radiating from the centre.

Macroscopical : Seeds grey or greenish grey, disc-shaped, nearly flat umbonate but sometimes irregularly bent, 10 to 30 mm in diameter and 4 to 6 mm thick; margin rounded or somewhat acute, hilum raised and connected to the micropyle by radial ridge. Surface silky, densely covered, with radiately arranged, closely appressed, outwardly directed, lignified hairs; endosperm, translucent, horny, having a central disc-shaped cavity, in which adjacent to the micropyle, lies the embryo, with 2 small, thin, cordate, 5 to 7 nerved cotyledons and terete radicle.

Microscopical : Testa, of one integument, outer epidermis of lignified thick-walled cells with sinuous polygonal outlines in surface view, small branched lumina and oblique linear pits, each cell prolonged externally into a closely appressed trichome, up to 1 mm long. The wall, having about 10 strongly lignified longitudinal ribs of the thickening; remainder of the testa consisting of flattened parenchyma, appearing in section as a brown band. In the region of the hilum, some very small spiral vessels occur as components of a short vascular strand. Endosperm with very thick walled hemicellulosic polyhedral cell with pits but connected by plasmodesmal strands and containing oil plasma and aleurone grains, upto about 30 µ in diameter. Embryo of small parenchymatous cells with oil droplets and small alurone grains.

Habitat : It grows in dry deciduous forests of Western Ghats and Himalayas.

History and authority : Introduced into Homoeopathic practice by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. VII, 83.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Nux Vomica in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV (Tincture)

OCIMUM SANCTUM
(Oci. sant.)

Botanical name : *Ocimum sanctum* Linn. **Family**: Labiatae (Lamiaceae)

Common name : *Hindi*: Tulsi.

Description : A much branched herb, 30 to 90 cm high, sometimes woody at the base. Stems and branches clothed with soft appearing hairs. Leaves 2.5 to 5 cm long, oblong or elliptic oblong, obtuse or acute, entire or subserrate, hairy on both surfaces and minutely dotted, petioles 1.25 to 2.5 cm long; racemes slender, 15 to 20 cm long, bracts not exceeding the calyx, broadly ovate or cordate-ovate, acuminate, ciliate; pedicles slender, as long as or longer than the calyx, 4 mm long, purplish-pink; upper pair of stamens with a small bearded appendage at the base. Nutlets broadly ellipsoid, smooth yellow dotted with black dots.

Microscopical : A transverse section of the leaf shows an epidermis composed of one layer of cells, with thin cuticle and many glands, glandular hairs and a few stomata; lower epidermis possesses numerous stomata, some glands, glandular and non-glandular hairs; the glandular hairs are stalkless and with unicellular head. The non-glandular hairs are uniseriate, multicellular and often very long. Glands consist of a few cells, containing essential oils and are found in depressions of the upper and lower epidermis. The palisade tissue consists of one layer of cells, spongy parenchyma of 4 to 6 layers with intercellular spaces and oleo-resin contents; midrib shows vascular bundle in centre in which xylem vessels are arranged in collenchymatous cells. The structure of petiole showing vascular bundles near the 2 arms.

Habitat : It is cultivated and planted throughout India.

History and authority : Mentioned in ‘Drugs of Hindoosthan’ by Dr. S. C. Ghose.

Part used : Whole plant excluding roots.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ocimum Sanctum, moist magma containing solids 100 g & plant moisture 233 ml	333 g
Strong Alcohol	800 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

OPIUM
(Opium)

Botanical name : *Papaver somniferum* Linn. **Family**: Papaveraceae

Common names : *Hindi*: Afim; *English*: Poppy; *French* and *German*: Opium.

Description : A glaucous, annual, quite glabrous, rarely branched. Leaves oblong, amplexicaul, lobed; lobes dentate. Flowers large, white sometimes purplish or scarlet. Capsule stalked, 2.5 cm in diameter, globose, glabrous; stigmatic rays 5 to 12. Seeds white or blackish.

Macroscopical : Indian opium cubical pieces; wrapped in tissue paper, varying from hard and brittle to plastic internally, dark brown, smooth and homogenous.

Microscopical : In the residue left after exhaustion with water, the following structures are usually found, a few fragments of outer epidermis of the poppy capsules; epidermal cells small, 5 or 6 sided with strongly thickened walls; stomata, few, large, of the ranunculaceous type; fragments of poppy leaf, showing upper epidermis of thin walled polygonal cells with no stomata, lower epidermis of cells with slightly wavy walls, stomata, numerous, large, of the ranunculaceous type; fragments of mesophyll and vascular bundles.

Habitat : India.

History and authority : Introduced in the Homoeopathic practice by Dr. Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. VII, 173.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Opium in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

(c) Trituration: 1x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

Old method : Dilution: Class IV, except that dilute alcohol must be used for 2x and dilutions.

PETROLEUM
(Petrol.)

Common names : Oleum petrae album, Rock oil, Coal oil; *French*: Huile mineral; *German*: Steinol.

Description : A dark yellow to brown or greenish-black, oily liquid; odour and taste characteristic. It is inflammable and burns with a bright, sooty flame. It is insoluble in water and very slightly soluble in alcohol, soluble in benzene, chloroform and ether. Its specific gravity is between 0.777 to 0.865. It is a native rock oil and consists essentially of a mixture of hydrocarbons, both aliphatic and aromatic. The substance as used by Hahnemann can be obtained by agitating the liquid portion of crude rock oil with sulphuric acid and rectifying the portion upon which the acid does not react.

Identification : (i) Dropped on white paper, it evaporates completely leaving no greasy stain.

(ii) Agitate with a mixture of equal volumes of *sulphuric acid* and *water*, no change takes place beyond its imparting to the acid, any yellow tint, it may possess and itself becoming colourless.

Storage : Preserve in well stoppered bottles.

History and authority : Allen's Encyclop. Mat. Med. VII, 311.

Preparation : (a) Mother Solution — Drug strength 1/10

Petroleum	100 ml
Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : VI-b

PHOSPHORUS
(Phosph.)

Chemical symbol : P **At. wt.**: 30.974

Common names : Phosphore; *French*: Phosphore; *Germen*: Phosphor.

Description : It is colourless or pale yellow, semi-translucent or transparent with waxy, lustre and consistency at ordinary temperatures; odour, disagreeable and tasteless. It is brittle, crystalline at low temperatures but soft and pliable at ordinary temperature. When exposed to air, it emits white fumes which are luminous in the dark and have garlicky odour. It is almost insoluble in water; soluble in 400 parts of *absolute alcohol*. Its specific gravity is 1.82. Melts at about 44°. It is obtained in the crude state from calcined bones.

Identification : When heated at about 50º, it ignites spontaneously with brilliant white flame.

Storage : Keep under water in strong, well-closed containers in a cool place and protected from light. Handle carefully with forceps.

History and authority : It was discovered in 1673 by Brandt and Alchemist and a little by kunkel. Hahnemann proved this drug. Allen's Encyclop. Mat. Med. Vol. VII, 366.

Preparation : (a) Mother Tincture ϕ Drug strength 1/667

Introduce 2 grammes of Phosphorus into a flask containing 100 ml of Strong Alcohol. Heat over a water bath till the Phosphorus melts and then shake vigorously till the excess Phosphorus solidifies. This saturated drug solution will equal in drug-strength to about one part in six hundred and sixty-seven (1/667). To compensate for loss of oxidation and to retain the full strength of the solution, a small piece of Phosphorus should be kept in each bottle containing the tincture and be removed whenever coated with the amorphous variety.

(b) Potencies: 3x to contain two parts of tincture, one part of *Strong Alcohol*. 4x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

PHYTOLACCA
(Phyto.)

Botanical name : *Phytolacca americana* Linn. **Family**: Phytolaccaceae

Synonyms : *Phytolacca decandra* Linn., *P. vulgaris* Bubani.

Common names : *English*: American night shade; *French*: Morella a' grappes; *German*: Americanische Kermesbeere.

Description : A strong smelling herb, 1 to 4 meter in height. Leaves oblong or ovate-lanceolate, 10 to 30 cm long; acute or acuminate. Flower small, about 2.5 cm across; in peduncled racemes 5 to 20 cm long, which are nodding in fruit; pedicels bracteate at base; stamens many in 2 series; ovary subglobose; fruit a fleshy berry, dark purple, about 12 mm across.

Macroscopical : In nearly cylindrical segments or short fusiform roots (rarely) for the most part in transverse, longitudinal or oblique irregularly broken slices, externally the bark is light brown to light yellowish orange, incompletely annulate and longitudinally or spirally wrinkled, texture fibrous, fracture fibrous, inner surface greyish to light brown, showing alternating circular zones of fibro-vascular tissue and parenchyma.

Microscopical : Transverse section of the root is characterized by the presence of suberised epidermis or upto 8 layers of cork, a narrow secondary cortex of parenchyma cells, containing starch or raphides of calcium oxalate or microcrystals, several concentric zones of open collateral fibrovascular bundles each of which alternates with a narrow zone of interstitial parenchyma, the bundles of each zone separated by broad pericyclic rays, whose cells contain either short raphides of calcium oxalate, starch grains or sand.

Habitat : Indigenous to North America and a common weed in Mediterranean countries.

History and authority : Mentioned in "Lesser Writings" by Hahnemann Allen's Encyclop. Mat. Med. Vol. VII, 502.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Phytolacca in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

PLATINUM METALLICUM
(Plat. met.)

Chemical symbol : Pt **At. wt.**: 195.09

Common names : Platina, Metallic Platinum; *French*: Platine; *German*: Platin.

Description : A lustrous, greyish-white, melleable and ductile metal; good conductor of heat and electricity. It is stable in air and does not tarnish on exposure to air. It is insoluble in single acid but is soluble in hot *aqua-regia* with the formation of chloroplatinic acid. Its specific gravity is 21.45. It melts at 1773°. It is found native. Precipitated platinum fit for homoeopathic trituration, may be obtained by placing polished steel rods in a dilute solution of platinic chloride upon which, the metal will be deposited as a spongy iron-grey mass, without luster. The precipitate, after being scraped off the rods with wooden scrapers, it is to be boiled with hydrochloric acid, then washed well with purified water and dried.

History and authority : Hahnemann was first to think of this metal as medicine and his proving in "Chronic Diseases" is our basis. Allen's Encyclop. Mat. Med. Vol. VII, 574.

Preparation : (a) Trituration 1x Drug strength 1/10

Platinum Metallicum precipitated	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

PLUMBUM METALLICUM
(Pb. met.)

Chemical symbol : Pb **At. wt.**: 207.19

Common names : Plumbum, Lead; *French*: Plomb; *German*: Blei.

Description : A heavy, bluish-grey, soft, feebly lustrous metal; tranishes on exposure to air. Pure water does not attack it in the absence of air. It is attacked by all acids, when heated. Its specific gravity is 11.34. It melts at 327.4º and boils at 1740º. It is commonly obtained from its ores, which are abundant in nature.

Identification : A solution in nitric acid responds to all the *reactions* characteristic of lead.

Total Foreign Metals (as sulphates) : Not more than 0.02 percent as determined by the following method:- Dissolve 50 g in 175 ml of dilute nitric acid with the aid of gentle heat. Filter by suction through a No. 4 sintered-glass, crucible and wash the filter with 25 ml of *water*. Combine the filtrate and washings. To 75 ml of this solution, add 20 ml of *water* and 10 ml of *sulphuric acid*, allow to stand for 5 minutes and filter. Evaporate the filtrate until white fumes are evolved; cool, add 5 ml of *water* evaporate again, till white fumes are evolved; cool, add 10 ml of *water*, 100 ml of *absolute alcohol*, allow to stand for two hours and filter. Remove the alcohol from the filtrate by evaporation and dilute to 95 ml with *water*. Take 50 ml of the solution in a silica dish, evaporate to dryness and ignite gently. Not more than 2 mg of residue is obtained.

History and authority : Proved by Hartlaub, Trinks, Hering and Nenning. Allen's Encyclop. Mat. Med. Vol. VIII, 1.

Preparation : (a) Trituration 1x — Drug strength 1/10

Plumbum Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol*.

PODOPHYLLUM PELTATUM
(Podo.)

Botanical name : *Podophyllum peltatum* Linn. **Family**: Berberidaceae

Common names : *English*: May-apple; *French*: Podophyllum; *German*: Entenfus Fussblattwurzel.

Description : An erect herb, upto 1 meter in height; leaves large, up to 30 cm across, 5 to 9 lobed, the lobes oblong and usually cleft and dentate at apex; flowering stems with usually similar leaves; flowers white, solitary, nodding, borne on the fork between the 2 leaves; sepals petaloid, shed early; petals 6 to 9 longer than the sepals; stamens twice as many as pistils; fruit ovoid, yellowish, 2.5 to 5 cm long, edible.

Macroscopical : The rhizome occurs in sub-cylindrical pieces, about 5 to 10 cm or more in length and about 5 mm thick; externally it is reddish-brown and smooth or slightly wrinkled longitudinally. The roots when present are cylindrical or flattened in shape, about 1.5 mm thick, brown and brittle. The rhizome breaks with a short fracture. The smoothed, transversely cut surface is white and starchy, unless the rhizome has been dried at a temperature sufficient to gelatinise the starch, in which case it is yellowish and horny, it shows a thin cork and a circle of about 20 to 30 small, oval, vascular bundles situated about half way between the centre and circumference of the rhizome. The drug has a slight characteristic, odour, somewhat bitter and acidic.

Microscopical : The diagnostic characters are: the epidermal cells with reddish-brown contents, the cells of the cylindrical portion being from 4 to 8 times as long as they are wide and sub-rectangular in shape, those of the enlarged regions being more nearly isodiametric, the cluster crystals of calcium oxalate, often more than 60 μ in diameter, the few small groups of usually cylindrical sclerenchymatous cells from the periphery of the pith.

Habitat : Throughout the United States. It is usually found in the most shady woods and low marshy ground.

History and authority : Introduced into Homoeopathy by Dr. Williamson in 1842. Allen's Encyclop. Mat. Med. Vol. VIII, 130.

Part used : Rhizome.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Podophyllum Peltatum in *coarse powder*	100 g
Purified Water	350 ml

Strong Alcohol 683 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

Revised Monograph Appeared in HPI Vol. X

PSORALEA CORYLIFOLIA
(Psorl. cor.)

Botanical name : *Psoralea corylifolia* Linn. **Family**: Leguminosae (Fabaceae)

Common names : *Hindi*: Babchi, Bakuch.

Description : An erect annual, upto 1 meter high. Branches firm, gland-dotted. Leaves simple, 2.5 to 7.5 cm long, roundish repand-toothed, firm, glabrescent, both sides with conspicuous black glandular dots. Flowers 10 to 30 in dense long, peduncled heads. Calyx 3 mm, teeth lanceolate, the lowest longest. Corolla little exerted white or yellow with purple tipped keel. Pod small, sub-globose, black glabrous.

Macroscopical : Fruits dark chocolate to almost black with pericarp adhering to the seed coat, 3 to 4.5 mm long, 2 to 3 mm broad, ovoid-oblong or bean-shaped, somewhat compressed, glabrous, rounded or mucronate, closely pitted; seeds campylotropous, non-endospermic, oily and free from starch.

Microscopical : The pericarp shows prominent ridges and depressions, consisting of collapsed parenchyma and large secretory glands, containing oleoresinous matter; testa, an outer layer of palisade epidermis, a layer of bearer cells, which are much thickened in the inner tangential and basal radial walls and 2 to 3 layers of parenchyma, cotyledons of polyhedral parenchyma and 3 layers of palisade cells of the adaxial side.

Habitat : Throughout India.

History and authority : "Drugs of Hindoostan" Dr. S. C. Ghose

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Psoralea Corylifolia in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Storage : Preserved in coloured bottles.

PULSATILLA NIGRICANS
(Puls.)

Botanical name : *Pulsatilla nigricans* Linn. **Family**: Ranunculaceae

Synonyms : *Anemone pratensis* L., *Pulsatilla pratensis* Mill., *P. vulgaris* Mill.

Common names : *English*: Wind Flower; *French*: Pulsatille; *German*: Kuchenschelle.

Description : A deciduous, perennial herb, with a spindle shaped, thick ligneous dark brown, oblique, several headed root. Stem 1 to 1.5 meter high, simple erect, rounded. Leaves radical, petiolate, bipinnatifid, with linear segments; at the base surrounded by several ovate, lanceolate sheaths. Flowers varying in colour from dark violet to light blue, bell shaped pendulous, terminal reflexed at the open, surrounded by distinct sessile involucre, composed of 3-palmately divided and cleft bracts with linear lobes.

Microscopical : Powder: light olive brown to dusky greenish yellow, numerous simple, thick walled hairs upto 2.5 mm in length and up to 20 µ in thickness, trachea upto 35 µ in breadth with spiral markings or bordered pores; fragments of epidermal tissue with stomata, the latter being broadly elliptic and upto 55 µ in length; in some stem epidermis; some epidermal cells with wavy vertical walls; calcium oxalate crystals and starch grains few or absent.

Habitat : Open fields and plains in dry places in many parts of Europe, Russia and Asia.

History and authority : Hahnemann introduced this in Homoeopathic practice in 1805. Allen's Encyclop Mat. Med. Vol. VIII, 20.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pulsatilla Nigricans in dried *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

PURIFIED WATER

Chemical symbol : H_2O **Mol. wt.**: 18.015

Description : A clear, colourless, tasteless and odourless liquid. Its density is taken as unity at the temperature of 15°. It has its maximum density at 4°. It is prepared from suitable, portable water by distillation or by the treatment with ion-exchange materials.

Identification : (a) It gives no residue after evaporation.

(b) It gives no precipitate when treated with *Barium chloride*, *silver nitrate* or *hydorgen sulphide.*

Acidity or alkalinity : Boil 100 ml in a flask made of boro-silicate glass until the volume is reduced to 75 ml and cool with precautions to exclude *carbon-di-oxide*. To 20 ml add 1 drop of *phenol-red* solution. If the solution is yellow it becomes red, on adding 0.1 ml of 0.1 N *sodium hydroxide*; if red, it becomes yellow, on adding 0.1 ml of 0.1 N *hydrochloric acid*.

Copper, iron and Lead: To 100 ml, add 0.05 ml *of sodium sulphide* solution, the liquid remains clear and colourless.

Albuminiod ammonia : To 500 ml, add 0.2 g of *magnesium carbonate* and distill 200 ml. Reject the distillate, add 25 ml of *alkaline potassium permanganate solution* and distill 100 ml. To this distillate, add 4 ml of alakaline *potassium mercuri-iodide solution*; the colour produced is not deeper than that produced by the addition of 4 ml of *alkaline potassium mercuri-iodide solution* to a mixture of 100 ml of *ammonia-free water* and 4 ml of *dilute ammonium chloride solution*.

Ammonia : To 50 ml, add 2 ml of *alkaline potassium mercuri- iodide solution* and view in a Nesseler cylinder placed on a white tile; the colour is not more intense than that given by 50 ml of *ammonia-free water* with the addition of 2 ml of *dilute ammonium chloride solution* (Nesseler's) when tested under similar conditions.

Oxidisable matter : Boil 100 ml for 10 minutes with 3 ml of *sulphuric acid* and 1 ml of 0.01 N *potassium permanganate*; the colour of *potassium permanganate* is not completely discharged.

Non-volatile matter : Leaves not more than 0.001 percent w/v of residue, when evaporate to dryness on a water bath and dried to constant weight at 105º.

Storage : The Purified Water must be filled at once, into well stoppered bottle.

Preparation : Used as a vehicle.

Revised Monograph Appeared in HPI Vol. X

RAUVOLFIA SERPENTINA
(Rau. serp.)

Botanical name : *Rauvolfia serpentina* Benth. ex Kurze. **Family**: Apocynaceae

Common names : *Hindi*: Sarpagandha, Chotachand.

Description : A small, erect, glabrous shrub, upto 1 meter high, with pale coloured bark. Leaves whorled, 7 to 18 cm long by 1.25 to 5 cm wide, lanceolate or oblanceolate, acute or acuminate, tapering gradually into the petiole, thin, pale beneath. Flowers white or pinkish, arranged in terminal or lateral corymbose cymes; peduncles about 2.5 to 5 cm, pedicels and calyx red, bracts minute, lanceolate, calyx lobes 2 mm long, lanceolate; petals about 12 mm long, tube slender, inflated a little above the middle; lobes much shorter than the tube, elliptic oblong, obtuse. Disc membranous, slightly lobed. Drupes about 6 mm in diameter; single or didymous and more or less connate, purplish-black when ripe.

Macroscopical : Root: stout, thick, about 10 cm long and 2 to 22 mm in diameter, tortuous, surface slightly wrinkled, rough with coarse longitudinal markings, rarely branched, fracture short irregular, root bark greyish yellow to brownish; wood pale yellow.

Microscopical : In transverse section, cork cells in 2 to 8 alternating bands of radially narrow and broader cells, thin cells lignified, up to 75 µ in tangential width, broader cells upto about 90 µ in radial length, phelloderm, tangentially elongated to isodiametric, parenchyma cells, containing starch and short latex cells with brown resinous matter; secondary phloem contains phloem parenchyma and sieve elements; parenchyma contains starch and angular crystals of calcium oxalate, 3 to 20 µ in length; secondary xylem constitutes four fifth of the diameter of the root, wood is traversed by medullary rays, 1 to 5 cells in the width; xylem consists of vessels, trachieds, wood parenchyma and woody fibres; vessels few, lignified, upto 350 µ in length and 50 µ in width or rarely more, simple or bordered pits; trachieds lignified, pitted; wood-parenchyma with moderately thick, lignified and pitted walls containing starch; wood fibres highly thickened with pointed or bifurcated ends 200 to 750 µ in length, in tangential bands and radial rows. Starch simple or 2 to 3 compound, spherical to sub-spherical; stone cells absent.

Habitat : Found in sub Himalayan ranges and Western Ghats of India.

History and authority : Proving made by Dr. W. Templeton. Brit. Hom. Journal 45, 155, 1955. “Drugs of Hindoostan” by Dr. S. C. Ghose.

Part used : Root.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Rauvolfia Serpentina in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IX

RHUS TOXICODENDRON

(Rhus. tox.)

Botanical name : *Rhus toxicodendron* Linn. **Family**: Anacardiaceae

Synonyms : *R. radicans* L., *R. humile, R. pubescens* (Mill.) Farw., *R. verrucosa* Scheele.

Common names : Poison ivy; *English*: Oak poison ash; *French*: Ambre à poison, Sumac vénéneux; *German*: Gift sumach, Wurtzel sumach.

Description : A deciduous shrub, with reddish branching stem, upto 1 meter high or climbing by rootlets. Leaves alternate, ternate, the lateral leaflets unequal at the pairs and sessile, the terminal one larger at the end of prolongation of the common petiole, rhombic-ovate, pointed. Flowers small, greenish-white, polygamous; in loose and slender axillary panicles. Whole plant is resinous, milky, acrid juice, staining black and extremely poisonous.

Habitat : In the forests of the United States.

History and authority : Introduced in Homoeopathic practice in 1816 by Hahnemann, under a common name Rhus. Allen's Encyclop. Mat. Med. Vol. VIII, 330.

Part used : Leaves.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Rhus Toxicodendron in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III

Caution : Poison; handle with care. Not to be prescribed below 3x.

RUTA GRAVEOLENS
(Ruta)

Botanical name : *Ruta graveolens* Linn. **Family**: Rutaceae

Common names : *Hindi*: Sadab, Satap; *English*: Bitter herb; *French*: Rue de jardins; *German*: Garten Raute.

Description : Strong smelling, glandulose herb, often shrubby below. Leaves petioled, decompound; segments cuneate, spathulate-oblong or linear-oblong. Flowers yellow in divaricately spreading corymbs; pedicels longer than the capsule; bracts lanceolate. Sepals triangular, acute. Petals oblong-obovate, pectinate, abruptly clawed. Capsules obtuse, shortly pedicelled. Seeds angled.

Habitat : Cultivated in gardens throughout India and other countries of the Western Asia.

History and authority : Introduced by Homoeopathic practice by Hahnemann 1818. Allen's Encyclop. Mat. Med. VIII, 431.

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ruta Graveolens in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, two parts Purified Water and seven parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class I

Revised Monograph Appeared in HPI Vol. X

SABADILLA
(Sabad.)

Botanical name : *Schoenocaulon officinale* (Sch.) A. Grey **Family**: Liliaceae

Synonyms : *Asagraea officinalis* (Schltdl. & Cham.) Lindl., *Helonias officinalis* (Schltdl. & Cham.) D. Don., *Veratrum officinale* Schltdl. & Cham.

Common names : *English*: Cevadilla seeds; *French*: Sebadille; *German*: Sabadilla saemen.

Description : A herbaceous plant, 1 to 1.5 meter in height, with linear tapering, entire leaves. Flowers yellow. Fruit consists of three slightly spreading brownish, papery follicles, about 12 mm long, united at the base, spreading somewhat towards the apex, opening by their ventral suture, each follicle contains usually two, some-time six seeds, these are 8 mm long, narrow, pointed flattened on one side, convex on the other, shinning, rugose, blackish-brown inodorous and have persistent, acrid and bitter taste.

Macroscopical : Sabadilla occurs as a mixture of loose seeds, with papery capsules. Seeds brownish-black, narrowly oblong to lance-linear, somewhat curved, angular, with a beak at one end, rounded at the other, 5 to 8 mm in length and upto 2 mm in thickness, testa wrinkled and thin, internally showing a whitish, oily albumen with a small, linear embryo at the rounded basal end; odour indistinct, taste bitter and acrid.

Habitat : Mexico, West Indies, Guatemala and Venezuala.

History and authority : Introduced by Dr. Stapf by proving in 1825. Allen's Encyclop. Mat. Med., Vol. VIII, 443.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sabadilla in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make on thousand millilitres of the Mother tincture.

(b) Potencies: 2 x and higher with *Dispensing Alcohol.*

Old method : Class IV

Revised Monograph Appeared in HPI Vol. X

SABINA
(Sabin.)

Botanical name : *Juniperus sabina* Linn. **Family**: Juniperaceae (Coniferae)

Synonyms : *Juniperus foetida* Spach, *J. lycia* L., *J. prostrate* Pers., *Sabina officinalis* Garcke.

Common names : *English*: Savin; *French*: Sabine; *German*: Sadebaum.

Description : An evergreen shrub, spreading horizontally or rising erect to the height of 1 to 5 meter. The trunk has pale, reddish brown, scaly bark. Leaves opposite or in threes, firm smooth, pointed, dark-green; are bitter and have a strong disagreeable smell. Flowers unisexual, dioeceous, small; the male catkins, the female cones at the extremities of lateral branches.

Macroscopical : The young twigs are gathered, 1 to 3 cm long and 1 to 2 mm thick, densely covered with 4 rows of appressed, scale-like, imbricate and rhomboid leaves, each about 2 mm long and with an oil gland, directly under its dorsal surface.

Microscopical : Transverse section of leafy twigs may be such as to include the stem and the adnate bases of 2 opposite leaves or leaf separate from stem. The first type of section presents an elliptic outline interrupted by 2 notches marking the places of separation of leaf bases. It is characterised further by showing an epidermis with sunken stomata and thick cuticle, slightly lignified hypodermis, a mesophyll with outer palisade and inner spongy parenchyma; embedded in which are 2 oily glands, one at either side, while in centre there is a coniferous stem tissues. On either side of each notch and embedded in the mesophyll is a small group of irregularly lignified cells called transfusion trachieds. The second type of cross section of leaf is almost seim-circular in out-line. The leaf is of the centric type and shows an epidermis, a hypodermis of interrupted groups of fibrous cells, which tend to be missing beneath the middle portion of the upper epidermis, mesophyll, with an outer layer of palisade cells, the remaining becoming shorter towards the centre. Embedded in the centre of this region is a meristele composed of mass of trachieds facing towards the upper surface and a mass of phloem tissue. Two groups of transfusion trachieds occur, on each side of meristele. A single oil gland lies embedded in the mesophyll.

Habitat : Temperate regions of Northern Hemisphere.

History and authority : Proved and then introduced into Homoeopathic practice by Hahnemann. Allen’s Encyclop. Mat. Med. Vol. VIII, 458.

Part used : Stem and Leaves.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sabina in *coarse powder*	100 g
Purified Water	112 ml
Strong Alcohol	903 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class III

Revised Monograph Appeared in HPI Vol. VII & IX

SACCHARUM LACTIS
(Sac. lac.)

Chemical symbol : $C_{12}H_{22}O_{11}.H_2O$ **Mol. Wt.**: 360.3

Common names : Sugar of milk, Lactose.

Description : A white, crystalline powder; odourless; taste, slightly sweet. It is soluble in 5 parts of water, more soluble in hot water; very slightly soluble in alcohol; particularly insoluble in *chloroform* and in *ether*. It may be obtained from the whey of milk. Its solution in water does not form a syrup.

Identification : (a) When heated, it melts, swells and burns, evolving an odour of burnt sugar and leaving a bulky, carbonaceous residue.

(b) When heated with the solution of *potassium cupri- tartrate*, a copious precipitate of cuprous oxide is formed.

Acidity : 5.0 g dissolved in 50 ml of freshly boiled *water*, requires for neutralization, not more than 0.5 ml of 0.1 N *sodium hydroxide*, *phenolphthalein solution* being used as indicator.

Clarity, colour and odour of solution : Dissolve 3.0 g in 10 ml of boiling water; the solution is clear, colourless and odourless.

Arsenic : Not more than 1 part per million.

Copper : Dissolve 2 g in 20 ml of *water*, add 1 ml of *dilute hydrochloric acid* and 10 ml of solution of *hydrogen sulphide*; no colour is produced.

More soluble Sugars : Shake 5.0 g with 20 ml of *alcohol* (90 percent) for ten minutes, filter, evaporate 10 ml of the filtrate to dryness and dry at 105°, the residue weighs not more than 7 mg.

Sulphated Ash : Not more than 0.1 percent.

Storage : Preserve in a well-closed container.

Preparation : Used as a vehicle.

Revised Monograph Appeared in HPI Vol. X

SANGUINARIA CANADENSIS

(Sang. ca.)

Botanical name : *Sanguinaria canadensis* Linn. **Family**: Papaveraceae

Synonyms : *S. acaulis* Moench, *S. grandiflora* Rosc., *S. minor.*

Common names : *English*: Blood root; *French*: Sanguinaire du Canada; *German*: Blutwurzel.

Description : A perennial, acaulesecent herb with a red cylindrical, prostrate rhizome, 2.5 to 10 cm long, 6 to 18 mm thick, slightly-branched, with fibrous root beneath and having an abundant, red-orange, acrid juice. Leaves arising from each bud of the rhizome, are 5 to 9 palmately lobed, on long red orange coloured petioles, glabrous, pale green above, bluish white beneath, with orange coloured veins. Flowers white, showy, 2.5 to 4 cm in diameter on a one flowered, naked scape 15 cm high, the bud erect, the petals usually 8; not crumpled.

Macroscopical : The drug occurs in entire or broken pieces of rhizome and roots. Rhizome, of horizontal growth, more or less cylindrical, somewhat vertically compressed, simple or branched, 2 to 7 cm in length and 5 to 16 mm in diameter, externally brown internally red, slightly annulate from leaf scars, showing on its upper surface a few stem scars and one its lower and lateral surfaces, numerous intact or broken filiform root and also root scars, fracture short and uneven.

Microscopical : Transverse section of the rhizome shows: Epidermis, a layer of thin walled outer cells. Cortex consisting of about 10 to 15 rows of parenchyma cells with thin walls, containing numerous small spheroidal, ovoid or plano-convex starch grains and occasionally globules of fixed oil. A comparatively narrow circular zone of numerous small, open collateral, fibro-vascular bundles separated from each other by short medullary rays. A very broad pith of thin walled parenchyma cells rich in starch grains. Latex cells, either isolated or arranged in chains and containing an orange-red, red or reddish brown latex, are to be observed scattered among cells of the cortex, pith and medullary rays.

Habitat : India, United States and Canada.

History and authority : Dr. Bute introduced this drug in the Homoeopathic practice after proving in 1837. Allen’s Encyclop. mat. Med. Vol. VIII, 481.

Part used : Rhizome.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sanguinaria Canadensis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class III.

SECALE CORNUTUM
(Sec. cor.)

Botanical name : *Claviceps purpurea* (Friles) Tul. **Family**: Hypocreaceae

Synonyms : *Acinula clavus, Clavaria clavus.*

Common names : *English*: Ergot of Rye; *French*: Ergot; *German*: Mutterkorn.

Description : A fungus, growing upon seed of the *Secale cornutum*. The grains or ergots are 8 to 12 mm long, 3 to 6 mm in diameter, sub-cylindrical or obtusely-triangular, tapering towards the ends, generally somewhat curved, transversely-fissured, having 3 longitudinal furrows and a detachable, yellowish hood at the apex; externally it is purplish-black, internally whitish; the surface is of uniform texture and breaks with a smooth fracture. It has a peculiar, offensive odour, a rancid taste, deteriorates when kept for a long time.

Macroscopical : Dark violet to nearly black; usually from about 1 to 3 cm long and from 1 to 5 mm broad, fusiform obscurely 3 angled, usually tapering towards both ends; often with a longitudinal furrow on each face and transversely cracked; brittle; fracture short; internally whitish or pinkish-white and showing darker lines radiating from the center.

Microscopical : Outer region thin of a few layers of dark purple to dark brown, collapsed cells in regular longitudinal rows; remainder of sclerotium of dense pseudo-parenchyma, small rounded or oval cells, varying in size, somewhat elongated in the central region, with thin and colourless, highly refractive, chitinous walls. Calcium oxalate, spores and vascular tissues absent.

Habitat : Found in fields on the rye plant.

History and authority : Introduced into Homoeopathic practice by Hartlaub and Trnks in 1832. Allen's Encyclop. Mat. Med. Vol. VIII, 551.

Part used : Whole fungus freshly dried in coarse powder.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Secale Cornutum freshly ground into *coarse powder*	100 g
Purified Water	530 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

(c) Trituration: 1x and higher.

Old method : Class III

SELENIUM
(Selen.)

Chemical symbol : Se **At. wt.**: 78.96

Common name : *German*: Selen.

Description : A dark red to black, crystalline or grey, amorphous powder; tasteless and odourless. It is insoluble in water and alcohol; slightly soluble in carbon disulphide. The crystalline form has a specific gravity 4.42 and a melting point of 144°. The specific gravity of grey variety is 4.8 and it melts at 318°. It is commonly found associated with sulphur in nature. Contains not less than 99.5 percent of Se.

Identification : (i) When heated in air, it burns with a blue flame, giving off reddish vapour.

(ii) With a little *hydrochloric acid* and *hydrogen sulphide* to its solution in *nitric acid*, gives a yellow precipitate, soluble in ammonium sulphide.

Assay : Dissolve about 1 g, accurately weighed, in 20 ml of a mixture of equal volume of *water, sulphuric acid* and *nitric acid* by heating. Not boiling and continue heating until the solution is colourless. No more nitrogen oxides are evolved. Cool, transfer to a 500 ml volumetric-flask and dilute to the mark with *water.* To 25 ml of this solution, add 20 ml of a cold mixture of equal volume of *sulphuric acid* and *water.* Followed by 100 ml of *water* and 16 g of *di-sodium hydrogen orthophosphate dodecylhydrate* and stir until the phosphate has dissolved. Add 20 ml of 0.1 N *potassium permangnate* and set aside for 30 minutes. Titrate the excess *potassium permangnate* with 0.1 N *ammonium ferrous sulphate solution,* using a 10 ml burette, when the end point is close, add 2 drops of *ferroin* indicator solution and complete the titration to produce a permanent pink colour. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.003948 g of Se.

History and authority : Selenium was discovered by Berzelius in 1818 and was introduced to Homoeopathy by Hering. Allen's Encyclop. Mat. Med. Vol. VIII, 576.

Preparation : (a) Trituration 1x — Drug strength 1/10

Selenium in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid, 8x, 9x and higher with *Dispensing Alcohol.*

SENEGA
(Seneg.)

Botanical name : *Polygala senega* Linn. **Family**: Polygalaceae

Common names : *English*: Rattle snake mille wort; *French*: Polygala de verginia; *German*: Senegawurzel.

Description : Stems several from a thick root, erect, angled, simple; leaves numerous, lanceolate to lance-elliptic or ovate-lanceolate or ovate, scabrous on the margin; racemes spike like, 2.6 mm long, keel crested with thick progress; capsule, flat, broader than long.

Macroscopical : Mixture of entire, conical, more or less tortuous and branched roots and broken pieces thereof together with detached rootlets; when entire roots are upto 8 cm (Southern senega) or 15 cm (Northern senega), externally light brown to light yellowish-orange; the crown being knotty; composed largely of short stem bases and numerous rose tinted or purple buds, which give it a rose-red or purple colour; fracture short; wood pale yellowish-orange to yellowish-white usually accentrically developed.

Microscopical : Transverse section of root of older portion shows: (i) Cork layer of 4 or 5 layers of tangentially elongated, brown to orange coloured cells; (ii) an indistinct phelogen seed only here and there; (iii) secondary cortex of about 20 rows of parenchyma on one side of root and only 10 or less on the other, the cells having slightly thickened walls and containing colourless or pale yellow amorphous substance, which is liberated in the form of large globules on addition of a drop of KOH, phloem or inner bark, the cells in radial rows, consisting of parenchyma, small groups of sieve tissue, in a portion adjacent to the cambium and medullary ray, the later from 1 to 3 cells wide; all cells in this zone shows a collenchymatous thickening of walls and contain an amorphous substance similar to that found in outer bark; (iv) a cambium ring of 1 layer of meristamatic cells; (6) a xylem composed of lignified and non-lignified portion.

Habitat : United States, Western New England to Wisconsin. Kentucky and Virgienia. These grow in rocky and open plains.

History and authority : Scidel introduced this in Homoeopathic practice after proving 1830. Archiv. IX, 2, 175. Allen's Encyclop. Mat. Med. Vol. VIII, 586.

Part used : Dried roots.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Senega moderately in *coarse powder*	100 g
Purified Water	500 ml

Strong Alcohol 537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class IV

SEPIA
(Sepia)

Zoological name : *Sepia officinalis* Linn. **Family**: Sepiadae

Common names : Octopus, *English*: Inky juice of the Cuttle-fish.

Description : The cuttle-fish is a cephalopodous mollusc, without an external shell, from 1 to 2 feet long, soft-gelatinous of a brown colour, verging on red and spotted back; its body is rounded, elliptical and enclosed in a sac furnished with a fleshy fin on each side along its whole length. The head, separated from body by a neck, is salient, round and provided with salient eyes of a livery red colour. The mouth is surrounded by 10 arms which are pedunculated, very large and furnished with suckers. The cuttle-fish ink is an excretory liquid contained in a bag about the size and shape of a grape within the abdomen of a sepia; it blackish-brown and issued by these animals to darken *water*, when they wish to catch their prey or escape from their pursuers. Ink-bag found separate from the liver and deeper in abdominal cavity; its external duct end in a kind of funnel and opens near the anus of animal. In the back of the fish is found an oval-oblong, movable bone from 8 to 12 cm long and from 1 and 4 to 8 cm broad, somewhat convex cretaceous and spongy. The cuttle fish inhabits the seas of a Europe especially Mediterranean. Sepia in a dry state, as it occurs in trade, appears to be a dark blackish-brown solid mass, of shinning, conchoidal, very brittle fracture, having a faint smell of sea fish, nearly without taste and scarcely dyeing the Saliva. It is enclosed in little skins and is of the shape of grapes.

Habitat : Indian Ocean, other seas of Europe and Mediterranean.

History and authority : Proved by Hahnemann. Allen's Encyclop. Mat. Med. Vol. III, 600.

Part used : Inky juice found in bag like structure in the abdomen of the cuttle-fish.

Preparation : (a) Trituration 1x — Drug strength 1/10

Sepia in fine powder	100 g
Sacharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be in accordance with the method, 6x may be converted to liquid 8x9x and higher with *Dispensing Alcohol.*

Old method : Dilutions- Class IV
Trituration-Class VII

SILICEA
(Sil.)

Chemical symbol : SiO_2 **Mol. wt.**: 60.06

Common names : Silica, Silicon dioxide, Quartz, Rock crystal, pure flint; *French*: Silica; *German*: Silica.

Description : A white amorphous powder; tasteless and odourless. It is insoluble in water and in dilute acids, except hydrochloric acid. It is prepared by the following process:-

Take 1 part of silica in powder, add four parts of dry sodium carbonate. Fuse the sodium carbonate in a large clay crucible and gradually add to the fused mass, the silica powder; at each addition, carbon dioxide escapes. When the evolution of carbon dioxide ceases, pour the fused mass upon a clean marble slab, while slightly warm, break it in a mortar into small pieces and transfer to a wide mouthed bottle, adding sufficient distilled water to dissolve it, the stopper is to be capped with a wet bladder. The next day dilute the solution and rapidly filter through cotton wool. Add to the filtered liquid *hydrochloric acid*, gradually in small quantities. The hydrated silica is precipitated in the form of bulky gelatinous white precipitate. Collect the precipitate and wash with distilled water upon a square frame filter. The washing must be continued until the filtrate is tasteless and no longer precipitate solution of silver nitrate. Then dry upon a porcelain water bath when it shrinks to an impalpable powder.

Identification : When a small fragment of *silica* is introduced in a bead of microcosmic salt (sodium ammonium phosphate) and heated silica will float in the bead, while hot and upon cooling the bead will become opaque and show a bead-like structure.

History and authority : Hahnemann introduced it in Homoeopathy Materia Medica. Allen's Encyclop. Mat. Med. Vol. IX, 1.

Preparation : (a) Trituration 1x — Drug strength 1/10

Silicea in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

SPONGIA TOSTA
(Spong. to.)

Zoological Name : *Sycon gelatinosum* Blainville, 1834 **Class**: Porifera

Synonyms : *Spongia officinalis* Linn, *S. usta.*

Description : Two or more species of spongia, known as Turkey sponge are used. The horny skeleton, from which the desired substance is prepared, consists mostly of siliceous or calcareous matter, while the spongy portion is soft, elastic, compressible and traversed by many lacunae, with circular openings on the surface. Bleached sponges are not suitable for medicinal purposes; those selected pieces are roasted until brown and friable.

Habitat : The Mediterranean, near Syria and Greece.

History and authority : The drug was proved by Hahnemann. Allen's Encyclop. Mat. Med. Vol. IX, 106.

Part used : Whole body including skeleton.

Preparation : I (a) Mother Tincture ϕ — Drug strength 1/10

Spongia Tosta in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

II (a) Trituration 1x — Drug strength 1/10

Spongia Toasta in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

STANNUM METALLICUM
(Stan. met.)

Chemical symbol : Sn **At. wt**: 119.09

Common names : Tin; *French*: Etain; *German*: Zinn.

Description : A silver white lustrous, soft, very malleable and ductile metal; only slightly tenacious, easily powdered. When being bent, emits the crackling 'tin cry'. Stable in air, but when in powder form, it oxidises, especially in the presence of moisture. Insoluble in water and alcohol, but slowly soluble in cold dilute *hydrochloric acid*, dilute *nitric acid* and in hot sulphuric acid; readily dissolved in concentrated *hydrochloric acid*. The precipitated metal is used for trituration.

Identification : (a) When metallic *zinc* is placed in a solution of tin in *hydrochloric acid*, the tin is precipitated in metallic form. The precipitated metal is soluble in boiling *hydrochloric acid* and the resulting solution, containing stannous chloride, yields a white or grey precipitate with *mercuric chloride.*

(b) A solution in acid gives a brownish-black precipitate with hydrogen sulphide.

Total Foreign metals : Not more than 0.04 percent as determined by following method:

Heat 2.5 g with 15 ml of *nitric acid* on a water-bath, until all the metal is dissolved, then evaporate to dryness; cool, digest with 3 ml of dilute *nitric acid* and 30 ml of water for 65 minutes, filter. Evaporate the filtrate to dryness, ignite and weigh the residue. Not more than 1 mg of residue is obtained.

History and authority : Hahnemann introduced this metal in Homoeopathic medicine. Allen's Encyclop. Mat. Med. Vol. IX, 129.

Preparation : (a) Trituration 1x — Drug strength 1/10

Stannum Metallicum precipitated	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

STAPHYSAGRIA

(Staph.)

Botanical name : *Delphinum staphysagria* Linn. **Family**: Ranunculaceae

Synonyms : *Staphysagria macrocarpa*; *S. Pedicularis.*

Common names : *English*: Louse seeds, Palmated larkspur; *French*: Staphisaigre; *German*: Stephanskorner.

Description : An ornamental, annual herb, with large tapering root. Stem up to 1.3 meter high, stout, upright, cylindrical, slightly branched. Leaves 10 to 12.5 cm in length, alternate, broad, palmately 5 to 9 cleft, petioled, pubescent or nearly smooth above, hairy on the veins beneath. Flowers light blue, in lax racemes. Fruit consists of 3 straight, oblong downy capsules, in each of which are about 12 seeds packed in 2 rows. Seeds about 6 mm long, are irregular 4 sided, pyramidal, sharp-angled little flattened, rough, testa wrinkled, pitted, blackish-brown, rather brittle, enclosing a soft, whitish, oily albumen.

Macroscopical : Seed: Pointed at one end, from 6 to 8 mm in length and breadth, obscurely four sided and of irregular pyramidal shape, one side being distinctly arched and broader than other, which are flattened; usually appearing grey in colour, but when free from the dust covered seen dark brown; surface coarsely reticulated, the reticulations 0.5 to 1 mm in diameter. A vertical section passing through the hilum shows a minute embryo at pointed end embedded in a large, yellowish-white, oily endosperm; testa taste-less, endosperm bitter, acrid.

Microscopical : The diagnostic characters of seed: Brown, polyhedral, thick-walled, epidermal cells of testa, about 230 to 320 µ tall in the ridges of surface reticulation and about 66 to 80 µ in the depressions between the ridges; conspicuous concentric lamination of the walls of the epidermal cells very numerous papillae, about 12 µ long, swollen apices, occurring on the outer surfaces of the epidermal cells; narrow layer of colourless, thin-walled flattened cells beneath the epidermis; inner layer of testa composed of brown, elongated pitted cells, lying parallel to the surface of the testa and exhibiting U-shaped thickenings in transverse sections; cells of endosperm, containing protein and fixed oil .

Habitat : Native of Italy, Greek islands and Asia Minor.

History and authority : Introduced by Hahnemann in Homoeopathic practice in 1819. Allen's Encyclop. Mat. Med. Vol. IX, 147.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ, Drug strength 1/10

Staphysagria, brushed 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class IV

SULPHUR
(Sulph.)

Chemical symbol : S **At. Wt.**: 32.07

Common names : Sulphur sublimatum, Sublimed sulphur, Flowers of sulphur, Brimstone; *French*: Fleurs de soufre; *German*: Schwefel-bluemen.

Description : A fine yellow, slightly gritty powder; odour, faint and not unpleasant, tasteless. Burns with a blue flame with the production of sulphur dioxide. It is almost insoluble in water and in alcohol; incompletely soluble in carbon disulphide. Sublimed sulphur may be prepared from native sulphur or from sulphides.

Identification : At about 115º, it melts to a yellow mobile liquid, which become dark and viscid on further heating at about 160º.

Microscopical Appearances : Consists chiefly of almost opaque, rounded amorphous particles or aggregates, sometimes associated with semicrystalline masses.

Arsenic : Not more than 2 parts per million.

Acidity : Thoroughly agitate 2g with freshly boiled, cooled water and titrate with 0.1 N *sodium hydroxide* using solution of *phenolphthalein* as indicator; not more than 1 ml is required.

Sulphated Ash : Not more than 0.2 percent.

Matter insoluble in carbon disulphide : Agitate 1 g with 20 ml of *carbon disulphide* and allow to stand for 10 minutes. Filter, wash the residue with *carbon disulphide* and dry; the residue weighs not more than 0.2 g.

History and authority : Hahnemann introduced this in Homoeopathy medicine. Allen's Encyclop. Mat. Med. Vol. IX, 276.

Preparation : (I) (a) Trituration 1x — Drug strength 1/10

Sulphur in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher *Dispensing Alcohol.*

II (a) Mother Tincture ϕ — Drug strength 1/5000

Sulphur in fine powder	0.2 g
Strong Alcohol	1000 ml

to make one thousand millilitres of the Mother Tincture.

0.2 g of Sulphur is added to 1000 ml of Strong Alcohol and allowed to remain into a well stoppered bottle for at least 48 hours, the bottle being shaken twice a day. The tincture is then poured off and filtered.

(b) Potencies: 2x to contain five parts of mother tincture and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Old method : Class VI-b

SULPHUR IODATUM
(Sul. iod.)

Chemical symbol : S_2I_2 **Mol. wt.**: 319.98

Common names : Sulphur iodidum, Ioduretum sulphuris, Sulphur di-iodide; *French*: Iodure de soufre; *German*: Jodschwefel.

Description : A greyish-black mass of metallic lustre and iodine odour. It gives off iodine on exposure to air. It is insoluble in water, soluble in carbon disulphide, alcohol, ether and potassium iodide solution dissolves iodine from the combination, leaving the sulphur. It is prepared by mixing intimately, one part of sublimed sulphur and four parts of iodine.

History and authority : It was proved by Kelsall on himself and some others. However, Hale, Berhim and Bredford were responsible to establish it in Homoeopathy. Allen's Encyclop. Mat. Med. Vol. IX, 415.

Preparation : (a) Trituration 1x Drug strength 1/10

Sulphur Iodatum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes to the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

SYZYGIUM JAMBOLANUM
(Syz. jam.)

Botanical name : *Syzygium cumini* (Linn.) Skeels **Family**: Myrtaceae

Synonym : *Engenia jambolana* Lam.

Common names : *Hindi*: Jamoon, Jambu.

Description : A large tree, bark light coloured, thick, rough exfoliating; branches, terete, very pale when dry. Leaves coroaceous, variable 6 to 11 cm by 4 to 6 cm, lanceolate, elliptic-oblong or broadly ovate-elliptic, acute sub-obtuse or shortly acuminate, smooth and shining, pellucid dotted, slightly narrowed at the base; main nerves slender, prominent on the lower surface. Petioles 1 to 2.5 cm long. Flowers dirty white, fragrant, about 5 to 7 mm across, sessile or shortly pediceled, crowded in heads on the ends of loosely panicle cymes rising from the branches below the leaves. Calyx 5 mm long, rugose externally, shortly turbinate; limb cup shaped, yellow inside, truncate or with 4 segments. Petals calyptrate.

Macroscopical : Fruit, the shape of an olive, sub-globose, varying in size from a pea to a pigeon egg, dark-purple, smooth, juicy, crowned with the truncate calyx-limb; 1-seeded. Technically these are berries. Seeds are stony. Seeds exalbuminous with straight, curved or twisted embryo.

Habitat : Throughout India.

History and authority : Dudgeon has used this in Homoeopathic potencies first. A Dictionary of Practical Mat. Med. Clarke Vol. III, 1354.

Part used : Seeds.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Syzygium Jambolanum in *coarse powder*	100 g
Purified Water	150 ml
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. IX

TABACUM
(Tabac.)

Botanical name : *Nicotiana tabacum* Linn. **Family**: Solanaceae

Common names : *Hindi*: Tambaku, Tamaku; *English*: Tobacco; *French*: Tabac; *German*: Tabak.

Description : An annual and herbaceous or sometimes of longer duration and somewhat shrubby at base, viscid-pubescent, erect, branching above. Leaves large, often 30 cm or longer, oblong-lanceolate, acuminate, sessile, the lower ones decurrent and half-clasping. Flowers 4 to 5 cm long, pedicelled, bracteate, in short many-flowered, panicle racemes; calyx oblong, with lanceolate, acute unequal segments; corolla wooly, funnel form, the throat somewhat swollen, the rose-coloured or red, limb with acute lobes. Capsule ovoid, 18 mm long, almost equal to the calyx.

Microscopical : A transverse section of the leaf shows an upper epidermis with glandular and non-glandular hairs. The non-glandular hairs are multi-cellular and either simple or branched. The walls of upper epidermal cells are somewhat straight, whereas those of lower surface are slightly wavy. Stomata are present on both sides. The glandular hairs have multicellular heads. Next to epidermis is one layer of long palisade cells containing chlorophyll. The spongy parenchyma consists of 4 to 6 layers of cells. Transverse section of midrib shows a ventral ridge, composed of collenchymatous cells. The dorsal side is also having two, more layers of collenchyma. The xylem vessels are arranged in the form of an arc in the centre and have phloem on dorsal side and supernumerary phloem no ventral side. The space between the vascular bundle and collenchyma, hairs are multicellular and of four forms (i) joined with pointed or blunt apex (ii) joined with pointed apex but branching (iii) glandular with multicellular heads and jointed stem (iv) glandular with multicellular heads and unicellular stalks.

Habitat : Cultivated all over India.

History and authority : Introduced in Homoeopathy by proving in 1831 by Hartlaub and Trinks. Allen's Encyclop. Mat. Med., Vol. IX, 467.

Part used : Leaves.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Tabacum in *coarse powder*	100 g
Purified Water	200 ml

Strong Alcohol 824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class II,

Revised Monograph Appeared in HPI Vol. X

TERMINALIA ARJUNA

(Term. arj.)

Botanical name : *Terminalia arjuna* W & A **Family**: Combretaceae

Synonym : *T. glabra* W & A

Common names : *Hindi*: Arjun, Arjuna.

Description : A large, deciduous tree, reaching 25 meter in height, with a very thick trunk and horizontally spreading branches, bark thick, smooth, greenish-white, flaxing off in large flat pieces. Leaves is usually sub-opposite, 10 to 15 cm by 4 to 7 cm oblong or elliptic oblong, obtuse or sub-acute, pale dull-green above, pale brown beneath, shallowly crenate, serrate in the upper part or sometimes throughout base, rounded or cordate, often unequal sided, veins reticulate, pellucid; petioles 6 to 18 mm long, with 1 or usually 2 prominent fands at the top immediately below the leaves. Flower sessile, in short axillary spikes or in terminal panicles, bracteole linear-lanceolate, shorter than the flowers, caduceus, calyx glabrous, 4 mm long; mouth broadly companulate, teeth triangular, 4 mm long. Ovary quite glabrous. Disk clothed with yellowish reddish hairs. Stamens much exserted. Drupe 2.5 to 5 cm long, ovoid or obovoid-oblong, fibrous-woody, glabrous, dark-brown, with 5-hard projecting wings.

Macroscopical : The bark occurs in the market as flat or slightly curved pieces of varying sizes, upto 15 cm or more in length and 10 cm in width and 0.3 to 1 cm in thickness. Outer colour grey and smooth. Internal colour is light grey and finely striated. Fracture short, showing pinkish bark.

Microscopical : The bark consists of cork with thick-walled, radially arranged cells. The cells of the cork are filled with tannin. The phloem is deep and traversed by uniseriate ray cells. Phloem consists of bast fibres, crystal fibres, sieve tubes with companion cells and phloem parenchyma. Bast fibres occur in groups and surrounded by one or two layers of concentric crystal fibres. The calcium oxalate crystals are mostly spheroidal in form. Tannin is found in all the tissues of bark.

Habitat : Throughout India.

History and authority : "Drugs of Hindoosthan" Dr. S. C. Ghose. Proving done by Dr. A. L. Verma. (Patna) Anant Mat. Med. 27 (Pub.-Dalvar Chemical Company).

Part used : Bark.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Terminalia Arjuna in dried *coarse powder*	100 g
Purified Water	160 ml
Strong Alcohol	875 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

THUJA OCCIDENTALIS
(Thuja)

Botanical name : *Thuja occidentalis* Linn. **Family**: Cupressaceae

Common names : *English*: American arbor-vitae; *French*: Thuja du Canada; *German*: Lebensbaum.

Description : A tall tree, upto 20 meter in height, with light red-brown bark, horizontal branches ascending at the end. Leaves acute, apiculate, usually conspicuously glandular, bright green above and yellowish green beneath. Flowers minute, solitary, terminal, the sexes commonly on different branchlets, staminate flowers yellow, of 6 to 12 decussate stamens; pistillate flowers with 8 to 12 scales in opposite pairs. Cones 12 mm long, brownish yellow, with 8 to 10 woody scales, 4 of which fertile; seeds winged.

Macroscopical : Twigs entire or broken, fan-shaped, flattened, bearing 4 rows of appressed, scale-like leaves, all bearing glands on back, odour balsamic aromatic, taste camphoraceous, turpentine like and bitter.

Microscopical : The powder of leaves greenish to brownish-green, fragments of chlorenchyma, fragment of epidermis, with broadly elliptical stomata, from 25 to 40 µ in length, the guard cells having lignified walls, numerous thick walled, lignified fibres with simple oblique pores.

Habitat : United States, found in swamps and on cool rocky banks.

History and authority : Introduced in Homoeopathic practice in 1819 by Hahnemann. Allen's Encyclop. Mat. Med. Vol. IX, 576.

Part used : Leaves and twigs.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Thuja Occidentalis in dry *coarse powder*	100 g
Purified Water	135 ml
Strong Alcohol	885 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class III

Revised Monograph Appeared in HPI Vol. X

TRIBULUS TERRESTRIS

(Trib. ter.)

Botanical name : *Tribulus terrestris* Linn. **Family**: Zygophyllaceae

Synonym : *Tribulus lanuginosus* Linn.

Common name : *Hindi*: Gokhru.

Description : A procumbent, densely hairy, prostrate herb, stems and branches pilose; younger parts silky villous. Leaves opposite, abruptly pinnate, one of each pair usually smaller than the other, sometimes wanting, stipules, lanceolate, hairy; leaflets 3 to 6 pairs, 6 to 12 mm long, oblong, muriculate, with appressed hairs beneath and more or less so on the upper surface, base rounded oblique; petioles very short, pilose. Flowers axillary or leaf-opposed, solitary; pale-yellow, 0.8 to 1.5 cm in diameter. Pedicels slender, hairy. Sepals 6 mm long, lanceolate, acute and hairy. Petals 10 mm long, oblong, stout. Fruit globose, consisting of (usually) 5 hairy or nearly glabrous, often muriculate, woody cocci, each with 2 pairs of hard, sharp spines, one pair longer than the other. Seeds several in each coccus, with transverse partition between them.

Microscopical : Leaflets covered with dense procumbent unicellular hairs. Hairs simple, long but unicellular. Stomata present on both the surfaces, but more on the lower surface and are of ranunculaceous type. Mesophyll centeric, vascular bundles of veins enveloped by pitted cells with thick walls.

Stem: fibrous bundles present in the primary cortex. Crystals usually in clusters.

Root: diarch tubercles of 2 distinct sizes, somewhat resembling the bacterial nodules of Leguminosae (Fabaceae), infested both externally and internally by fungal hyphae.

Habitat : A common weed throughout India and upto 3300 meter in Kashmir and other warm region of the world.

History and authority : Materia Medica with Repertory Boericke, II, 651. (Indian Edition).

Part used : Whole plant.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Tribulus Terrestris, moist magma containing solids 100 g and plant moisture 350 ml	450 g
Strong Alcohol	650 g

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x with *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

VERATRUM VIRIDE

(Vert. vir.)

Botanical name : *Veratrum viride* Ait. **Family**: Liliaceae

Synonyms : *Helonias viridis* (Aiton) Ker Gawl, *Veratrum eschscholtzii* A. Gray, *V. parviflorum* Michx.

Common names : *English*: American white hellebore; *French*: Veratrevert; *German*: Gruner Germer.

Description : A perennial herb, with coarse, thick, fleshy, rhizomes, more or less horizontal, with numerous white rootlets upon the lower parts, having a strong, unpleasant odour when fresh, nearly odour-less when dried. Stem upto 1⅓ meter high, stout, erect simple, leafy to the top, striated and pubescent; leaves 3-ranked, broadly-oval, strongly plaited sheath clasping, acuminate the lower leaves 15 to 30 cm long, curly, decreasing in size upwards to mere lanceolate bracts. Flowers polygamous, yellowish-green on pedicles much shorter than bracts, are in dense, spreading, spike like racemes on roundish, downy peduncles, composing a terminal pyramidal panicle.

Macroscopical : Rhizome about 5 to 8 cm long, 2 to 3.5 cm wide, sub-cylindrical and obconical below and crowned with the remains of concentrically arranged leaf-bases cut off level with the top of rhizome; grey, rough and enveloped externally with very numerous stout, yellowish-brown, transversely shriveled roots or showing root scars; taste bitter and acrid.

Microscopical : The diagnostic characters are: dark brown polyhedral cork cells; cortical parenchyma, containing simple and compound starch grains-measuring 4-8 to 14-20 µ and bundles of a acicular crystals of calcium oxalate; yellowish cells of the endodermis, thickened on the inner and lateral walls; pitted vessels of the xylem; root showing an outer layer of axially elongated, thickened, brown cells and pitted, elongated cells of the endodermis.

Habitat : Indigenous to North America from Canada to Georgia.

History and authority : Introduced in Homoeopathic practice in 1862. Allg. Home. zeit. IXIV M 626. Allen's Encyclop. Mat. Med. Vol. X 95, 639.

Part used : Rhizome.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Veratrum Viride in *coarse powder* 100 g

Purified Water	233 ml
Strong Alcohol	800 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Old method : Class III

Revised Monograph Appeared in HPI Vol. VIII & X

WITHANIA SOMNIFERA

(With. som.)

Botanical name : *Withania somnifera* Dunal. **Family**: Solanaceae

Synonyms : *Physalis somnifera* Linn, *P. flexuosa* L.

Common name : *Hindi*: Ashvagandha.

Description : An erect, branching, under shrub, upto 1.5 meter high, nearly all parts more or less stellately tomentose; branches flexuous, densely tomentose. Leaves petioled, 5 to 10 cm long, ovate, sub-acute, main lateral nerves about 6 pairs, prominent, petioles 6 to 12 mm long. Flowers greenish or lurid yellow, usually about 5 together in sub-sessile umbelliform cymes, pedicles 6 mm long or less. Calyx in flower, 5 mm in diameter, enclosed in the much enlarged inflated, somewhat 5 angled pubescent calyx. Fruit red when ripe.

Macroscopical : Roots are straight, unbranched and conical, thickness of the roots vary with age and the main roots bear fibre-like secondary roots, outer surface buff to grey-yellow with longitudinal wrinkles; crown consists of 2 to 6 remains of the stem base. Stem bases are variously thickened; nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles; fracture short and uneven.

Microscopical : Young Root: Cork consists of 2 to 6 rows of isodiametric non-lignified and suberised cells; phellogen indistinct; phelloderm consists of 8 to 9 rows of tangentially elongated compact cells; phloem parenchyma are isodiametric with the intercellular spaces; cambium consists of a wide zone of mostly xylem parenchyma, trachieds and fibres; primary xylem in the central core-consist of inter-xylary phloem; vessels with bordered pits; spiral and annular vessels are also present.

Old roots: Corks rare exfoliated or crushed; when present are isodiametric and non-lignified; phellogen, 2 to 4 rows of cells; phylloderm consists of about 20 layers of compact parenchymatous cells; phloem consists of sieve tubes, companion cells, phloem parenchyma; cambium of 4 to 5 rows of tangential elongated cells, secondary xylem is hard and forms a closed vascular ring separated by multiseriated medullary rays, xylem parenchyma are few.

Habitat : Throughout India.

History and authority : "Drugs of Hindoostan" by Dr. S. C. Ghose. Proved at Midnapore Homoeopathic Research Centre, W. Bengal, India.

Part used : Roots.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Withania Somnifera in *coarse powder*	100 g
Purified Water	250 ml
Strong Alcohal	800 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

ZINCUM METALLICUM

(Zinc. met.)

Chemical symbol : Zn **At. wt.**: 65.37

Common names : Zinc; *French*: Zinc; *German*: Zink.

Description : A bluish white metal having a crystalline structure or a fine grey powder free from all, but small aggregates. Soluble in dilute hydrochloric acid or dilute sulphuric acid. Contains not less than 90.0 percent Zn.

Identification : Yields reaction characteristic of Zinc.

Assay : Shake 1 g, accurately weighed, with a solution of 25 g of *ferric ammonium sulphate* in 100 ml of water, in a vessel from which the air has been displaced by carbon dioxide, until the *zinc* is completely dissolved. Add 100 ml of *dilute sulphuric acid*, dilute to 500 ml with *water* and titrate 50 ml of this solution with 0.1 N *potassium permanganate*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.003269 g of Zn.

History and authority : It was proved Hahnemann and his associates. Allen's Encyclop. Mat. Med. Vol. X, 176.

Preparation : (a) Trituration 1x Drug strength 1/10

Zincum Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, 6x may be converted to liquid 8x, 9x and higher with *Dispensing Alcohol.*

APPENDICES

APPENDICES

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APPENDIX—I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Acetic Acid (95 percent) : Of the Homoeopathic Pharmacopoeia of India.

Acetic Acid (90 percent) : To glacial acetic acid add sufficient quantity of water to produce a solution containing 90 percent w/v of $C_2H_4O_2$.

Acetic Acid, Dilute (Approximately 6 percent w/w of $C_2H_4O_2$).

Acetic anhydride : $(CH_3CO)_2O$
Contains not less than 95 percent of $C_4H_6O_3$.

Description : A colourless, refractive liquid; pungent odour. It boils at 140°. It is slowly soluble in water, forming acetic acid; soluble in chloroform and ether. *Wt per ml.* : 1.080 g.

Assay : Weigh accurately about 2 g in a glass stoppered flask. Add 100 ml of carbondioxide free water, stopper, allow to stand for 30 minutes, add *phenolphthalein* solution and titrate with 1 N *sodium hydroxide*, calculate the percentage of $(CH_3CO)_2O$ by the formula (34.03v/w) / 566.7, where V is the volume in ml of the sodium hydroxide used, and W is the weight in g, of the sample.

Alcohol (95 percent) : Strong Alcohol of the Homoeopathic Pharmacopoeia of India.

Alcohol (90 percent) : Dispensing Alcohol of the Homoeopathic Pharmacopoeia of India.

Alcohol (50 percent) : Dilute 526 ml of Alcohol (95 percent) to 1000 ml with Purified Water.

Alcohol (20 percent) : Dilute 210 ml of Alcohol (95 percent) to 1000 ml with Purified Water.

Alcohol, Absolute : Contains not less than 99.4 percent v/v or 99 percent w/w and not more than 100.0 percent v/v or 100.0 percent w/w C_2H_6O.
It complies with the requirements given under Alcohol (95 percent) of Homoeopathic Pharmacopoeia of India.

Alcohol (95 percent), Aldehyde-free : Alcohol (95 percent) which complies with the following additional test : Aldehyde : To 25 ml, contained in a 300 ml flask add 75 ml of solution of dinitrophenyl hydrazine, heat on a water-bath under a reflux condenser for twenty four hours, remove the alcohol by distillation, dilute to 200 ml with 2 percent v/v solution of sulphuric acid and set aside for twenty four hours; no crystals are produced.

Amaranth : Contains not less than 72 percent of $C_{20}H_{11}N_2O_{10}Na_3S_3$.

Description : Dark reddish brown powder.

Identification : Boil a 1 percent w/v solution with aluminium hydroxide, filter and add one drop of solution of copper sulphate; a yellow colour that changes to red on acidification is produced.

Colour : The colour of a 1 percent w/v solution when viewed through a depth of a 1 cm is vivid red.

Assay : Weigh accurately about 0.4 g, dissolve in water, add 10 g of sodium acid tartrate, heat to boiling, pass a current of carbon dioxide through the solution and titrate with 0.1 N titanous chloride. Each ml of 0.1 N titanous chloride is equivalent to 0.01511 g of $C_{20}H_{11}N_2O_{10}Na_3S_3$.

Ammonia Solution, Dilute : Dilute 375 ml of strong ammonia solution, to 1000 ml with water. This solution contains approximately 10 percent w/w of NH_3 and has a weight per ml of about 0.957 g.

Ammonia Solution, Strong : Ammonium causticum of the Homoeopathic Pharmacopoeia of India.

Ammonium Acetate : $CH_3CO_2NH_4$.

Description : Colourless crystals or crystalline masses, odour, slightly acetous, very deliquescent.

Solubility : Very soluble in water and in alcohol.

Reaction : Dissolve 1 g in 20 ml of carbon dioxide free water; the reaction of the solution is not more acid than pH 6.5 using solution of bromothymol blue as indicator.

Chloride : 3.5 g complies with the limit test for chlorides.

Sulphate : Dissolve 4 g in 5 ml of water, add 10 mg of sodium bicarbonate evaporate to dryness and heat at 120° until the ammonium acetate is volatilised. The residue complies with the limit test for sulphates.

Sulphated ash : Not more than 0.035 percent.

Ammonium Acetate, Dilute solution of : Dissolve sufficient ammonium acetate in water to produce a solution containing 61.5 percent w/v of CH_3COONH_4.

Ammonium bicarbonate : of Indian Pharmacopoeia.

Ammonium carbonate : A variable mixture of ammonium bicarbonate (NH_4HCO_3) and ammonium carbonate ($NH_2CO_2NH_4$). Contains the equivalent of not less than 30.0 percent of NH_3.

Description : Translucent, hard crystalline masses; odour, strongly ammoniacal, taste, pungent and ammoniacal. Exposed to air, it partially dissociates and volatilizes and becomes converted into porous lumps or a white powder.

Solubility : Soluble in about 4 parts of water; partly soluble in alcohol, yielding a residue of the bicarbonate.

Iron : Boil 2.5 g with water until all the ammonia has been driven off; the solution complies with the limit test for iron.

Chloride : 10 g, boiled with water until all the ammonia has been driven off; complies with the limit test for chlorides.

Sulphate : 10 g, boiled with water until the ammonia has been driven off; complies with the limit test for sulphates.

Tarry matter : Mix 5 g with 15 ml of water and 7 g of citric acid and stir until dissolved; no tarry odour is produced.

Non-volatile matter : When volatilised at a temperature below red heat leaves not more than 0.25 percent of residue.

Assay : Weight accurately about 2g and dissolve in 50 ml of 1 N sulphuric acid, diluted with 50 ml of water, boil, cool and titrate the excess of acid with 1 N sodium hydroxide, using solution of methyl red as indicator. Each ml of 1 N sulphuric acid is equivalent to 0.01703 g of NH_3.

Ammonium Carbonate should be kept in a well-closed container.

Ammonium Carbonate, Solution of : Dissolve 5 g of ammonium carbonate in a mixture of 7.5 ml of dilute ammonia and 50 ml of water; add sufficient quantity of water to produce 100 ml; filter, if necessary.

Ammonium Chloride : Of the Indian Pharmacopoeia.

Ammonium Chloride, Solution of : A 10.0 percent w/v solution of ammonium chloride in water.

Ammonium Hydroxide, solution of : Mix 1 volume of water with 2 volume of Ammonia, strong solution.

Ammonium Molybdate : $(NH_4)_6Mo_7O_{24}, 4H_2O$.

Contains about 80 to 83 percent of MoO_3.

Description : White crystals or crystalline masses sometimes with a yellowish or green tint. It is soluble in water; insoluble in alcohol.

Phosphate : Dissolve 5 g in 5 ml of dilute ammonia solution and 15 ml of water, the solution is not more than slightly turbid; add it to 25 ml of nitric acid and 50 ml of water and allow to stand at about 40° for six hours; not more than a slight yellow precipitate is produced.

Assay : Weigh accurately about 0.2 g and dissolve in 40 ml of dilute ammonia solution and 50 ml of water and add 20 ml of glacial acetic acid; heat to boiling and add 10 ml of solution of lead acetate and 40 ml of water. Boil gently until the precipitate becomes granular, collect the

precipitate in Gooch crucible, wash with hot water and dry; and ignite at a dull red heat. Each g of residue is equivalent to 0.3921 g of MoO_3.

Ammonium Molybdate, Solution of : A 10.0 percent w/v solution of ammonium molybdate in water.

Ammonium Nitrate : NH_4NO_3.

Description : Colourless crystals.

Solubility : Readily soluble in water.

Reaction : A solution in water is slightly acid to solution of litmus.

Chloride : 3.5 g complies with the limit test for chlorides.

Sulphate : 5 g complies with the limit test for sulphates.

Sulphated ash : Not more than 0.05 percent.

Ammonium Nitrate, Solution of : A 2.5 percent w/v solution of ammonium nitrate.

Ammonium Oxalate : $(CO_2NH_4)_2\ 2H_2O$.

Description : Colourless crystals.

Solubility : Soluble in water.

Chloride : 2 g, with an addition of 2 ml of nitric acid, complies with the limit test for chlorides.

Sulphate : Dissolve 1 g in 50 ml of water, add 2.5 ml of hydrochloric acid and 1 ml of solution of barium chloride and allow to stand for one hour; no turbidity or precipitate is produced.

Sulphated ash : Not more than 0.05 percent.

Ammonium Oxalate, Solution of : A 2.5 percent w/v solution of ammonium oxalate in water.

Ammonium Polysulphide, Solution of : Dissolve sufficient quantity of sublimed sulphur in solution of ammonium sulphide to produce a deep yellow solution.

Ammonium Sulphide, Solution of : Saturate 120 ml of dilute ammonia solution with washed hydrogen sulphide; add 80 ml of dilute ammonia solution.

Solution of Ammonium sulphide must be recently prepared.

Ammonium Thiocyanate : NH_4SCN.

Description : Colourless crystals.

Solubility : Very soluble in water, forming a clear solution; readily soluble in alcohol.

Chloride : Dissolve 1 g in 30 ml of solution of hydrogen peroxide, add 1 g of sodium hydroxide, warm gently, rotate the flask until a vigorous reaction commences and allow to stand until the reaction is complete; add a further 30 ml of solution of hydrogen peroxide, boil for two minutes, cool and add 10 ml of dilute nitric acid and 1 ml of solution of silver nitrate; any opalescence produced is not greater than that obtained by treating 0.2 ml of 0.01 N hydrochloric acid in the same manner. Sulphated ash moisten 1 g with sulphuric acid and ignite gently, again moisten with sulphuric acid and ignite, the residue weighs not more than 2.0 mg.

Ammonium Thiocyanate, solution of : A 10.0 percent w/v solution of ammonium thiocyanate in water.

Aqua regia (Nitrohydrochloric acid) : It is made by mixing 20 percent nitric acid with 80 percent *hydrochloric acid* in a dish or loosely stoppered container and allowing to stand at room temperature for about 15 hours or until gas is no longer evolved.

It immediately liberates iodine when 1 drop of the acid is added to 1 ml of an aqueous solution of potassium iodide (1 in 5).

Barium Carbonate : Baryta Carbonica of the Homoeopathic Pharmacopoeia of India.

Barium Chloride : $BaCl_2\,2H_2O$.

Description : Colourless crystals.

Solubility : 1g dissolves completely in 5 ml of water.

Lead : Dissolve 1 g in 40 ml of recently boiled and cooled water, add 5 ml of lead free acetic acid, render alkaline with lead-free solution of ammonia and add 2 drops of lead-free solution of sodium sulphide. Not more than a slight colour is produced. *Nitrate* : Dissolve 1 g in 10 ml of water, add 1 ml of solution of indigo caramine and add 10 ml of nitrogen free sulphuric acid and heat to boiling. The blue colour does not entirely disappear.

Barium Chloride, Solution of : A 10.0 percent w/v solution of barium chloride in water.

Borax : Of the Homoeopathic Pharmacopoeia of India.

Bromine : Br_2

Description : A reddish brown, fuming, corrosive liquid, sparingly soluble in water; soluble in alcohol and in ether.

Iodine : Boil 0.2 ml with 20 ml of water, 0.2 ml of 1 N sulphuric acid and a small piece of marble until the liquid in almost colourless, cool, add one drop of liquefied phenol, allow to stand for two minutes and then add 0.2 g of potassium iodide and 1 ml of solution of starch; no blue colour is produced.

Arsenic : Not more than 1 part per million.

Sulphate : Shake 3 ml with 30 ml of ammonia solution and evaporate to dryness on a water-bath, the residue complies with the limit test for sulphates.

Non-Volatile matter : Leaves not more than 0.1 percent of its weight, when evaporated to dryness in porcelain dish on a water-bath.

Bromine Solution of : A saturated solution of bromine in water.

Brucine : $C_{23}H_{26}O_4N_2.4H_2O$ — An alkaloid obtained from Nux-vomica.

Description : Colourless crystals; soluble in 320 parts of water.

Identification : When treated with nitric acid gives a deep red colour.

Calcium Carbonate : Of the Indian Pharmacopoeia.

Calcium Chloride, Solution of : A 10.0 percent w/v solution of calcium chloride in water.

Calcium Oxide : (Quicklime) CaO.

Description : Dry, white lumps or powder; it readily absorbs moisture and carbon dioxide from the atmosphere. When moistured with water, a reaction takes place with the evolution of heat and the lumps swell and fall to powder forming calcium hydroxide.

Loss on ignition : When ignited strongly, loses, not more than 10 percent of its weight.

Calcium Sulphate : $CaSO_4.2H_2O$.

Description : A white powder.

Solubility : Slightly soluble in water.

Chloride : Boil 5 g with 50 ml of water and filter while hot. The filtrate after cooling, complies with the limit test for chlorides.

Acid insoluble matter : Boil 2 g with 100 ml of 1 N hydrochloric acid, filter, and wash with hot dilute hydrochloric acid and then with water, dry, ignite and weigh; the residue weighs not more than 2 mg.

Alkalinity : Boil 1 g with 50 ml of water, cool and titrate with 0.1 N hydrochloric acid, using solution of bromothymol blue as indicator; not more than 0.3 ml of 0.1 N hydrochloric acid is required.

Carbonate : Boil 1 g with 10 ml with water and add 1 ml of hydrochloric acid; no carbon dioxide is evolved.

Residue on ignition : When ignited, leaves not less than 78.5 percent and not more than 80.0 percent of residue.

Calcium Sulphate, Solution of : A saturated solution of calcium sulphate in water.

Carbon Dioxide : Of the Indian Pharmacopoeia.

Carbon Disulphide : CS_2.

Description : A clear, almost colourless, inflammable liquid.

Boiling range : Not less than 95.0 percent, distils between 46° and 47°.

Wt. Per ml : At 25°, about 1.263 g.

Non-volatile matter : When evaporated to dryness on a water-bath and dried to constant weight at 105°, leaves not more than 0.005 percent w/v of residue.

Carbon Tetrachloride : CCl_4.

Description : A clear, colourless, volatile liquid; odour, characteristic. It is almost insoluble in water, miscible with ethyl alcohol and in solvent ether. Not less than 95 percent distils between 76° and 77°.

Wt. Per ml : At 20°, 1.592 to 1.595.

Acidity : Shake 13 ml with 25 ml of carbon dioxide free-water for 5 minutes, separate and reject the carbon tetrachloride. To 10 ml of the water layer add 2 drops of solution of phenolphthalein and titrate with 0.1 N sodium hydroxide; not more than 0.05 ml is required to produce a pink colour.

Residue on evaporation : Evaporate 63 ml on a steam-bath and dry at 105° for 30 minutes; the residue weighs not more than 1 mg. (0.001 percent).

Free chlorine : Shake 10 ml for 2 minutes with 10 ml of water containing 2 drops of solution of potassium iodide and allow to separate; the lower layer does not show a violet tint.

Charcoal : Decolourising-

Description : A fine, black powder.

Decolourising power : Add 0.1 g to 50 ml of a 0.006 percent w/v solution of bromophenol blue in alcohol (20 percent) contained in a 250 ml flask and mix by rotating the vessel; allow to stand for five minutes and filter; the colour of the filtrate is not deeper than that of a solution prepared by diluting 1 ml of solution of bromophenol blue to 50 ml with alcohol (20 percent).

Acid soluble matter : Heat 1g with 10 ml of dilute sulphuric acid and 20 ml of water for five minutes on a water-bath. Filter, evaporate the filtrate to dryness, ignite and weigh; the residue weighs not more than 25 mg.

Sulphated ash : Not more than 5.0 percent.

Chlorine, Solution of : A saturated solution of chlorine in water.

Chloroform : Of the Indian Pharmacopoeia.

Citric Acid : Of the Indian Pharmacopoeia.

Collodion, Flexible : Of the Indian Pharmacopoeia.

Copper : Cu. The pure metal, known commercially under the term 'electrolytic copper'.

Description : Usually in the form of turnings or borings.

Copper Sulphate : Of the Indian Pharmacopoeia.

Copper Sulphate, Solution of : A 12.5 percent w/v solution of copper sulphate in water.

Dinitrophenyl hydrazine - (2:4) : Dinitrophenyl hydrazine $(NO_2)_2C_6H_3NH\ NH_2$.

Description : Orange red crystals or a crystalline powder.

Solubility : Insoluble in water; slightly soluble in alcohol, 0.5 g yields a clear yellow solution on heating with a mixture of 25 ml of water and 25 ml of hydrochloric acid.

Melting range : 198° to 200°.

Sulphated ash : Not more than 0.5 percent.

Dinitrophenyl hydrazine, Solution of : Dissolve 1.5 g of dinitrophenyl hydrazine in 20 ml of sulphuric acid (50 percent v/v); dilute to 100 ml with water and filter.

Solution of Dinitrophenyl hydrazine must be prepared fresh.

Disodium Ethylenediamine Tetracetate : $C_{10}H_{14}O_8N_2Na_2 . 2H_2O$.

Description : White crystals.

Reaction : pH of a solution of 5 g in 100ml of ammonia-free and carbondioxide : free water, 4.0 to 6.0.

Assay : Weigh accurately about 2g and dissolve in 25 ml of water, add 2 drops of solution of eriochrome black T, prepared by dissolving 0.5 g of eriochrome black in 0.9 g of hydroxylamine hydrochloride in 100 ml of methyl alcohol and 5 ml of ammonia : ammonium chloride buffered. Mix and titrate with freshly standardised magnesium chloride solution until the solution is wine red in colour. Calculate the percentage $C_{10}H_{14}O_8N_2Na_2 . 2H_2O$ by the formula 1530.4 (VC/W) in which 'V' is the volume of the magnesium chloride solution in ml, 'C' the concentration of the standard magnesium chloride solution in g of magnesium per ml and 'W' is the weight of the sample; not less than 99.0 percent is found. Magnesium chloride solution is prepared by dissolving 32g of magnesium chloride in water to produce 1000 ml. The solution is standardised as follows : To 10 ml of the solution, add 140 ml of water, heat to 75°, add 10 ml of a solution of 5g of 8-hydroxyquinoline in 100 ml of 2 N, acetic acid and slowly add dilute ammonia solution until the pH is between 11 and 12. Cool the solution and after one hour filter through a tared Gooch crucible. Wash with cold water, ignite to constant weight. Each g of precipitate is equivalent to 0.6032 g of magnesium.

Disodium hydrogen orthophosphate, decahydrate : Natrum Phosphoricum of the H.P.I.

Ether, Solvent : Of the Indian Pharmacopoeia.

Ethyl Alcohol, Strong alcohol of the Homoeopathic Pharmacopoeia of India.

Ferric Ammonium Sulphate : $Fe(NH_4)(SO_4)_2 . 12H_2O$.

Contains not less than 99.0 percent and not more than the e equivalent of 101.0 percent of $Fe(NH_4)(SO_4)_2 . 12H_2O$.

Description : Pale violet crystals, or a nearly colourless crystalline powder.

Solubility : Soluble in water, yielding a clear yellow or brown solution.

Ferrous iron : Dissolve 1 g in 50 ml of water, add 1 ml of dilute hydrochloric acid and 1 ml of solution of potassium ferricyanide; no green or blue colour is produced.

Assay : Dissolve about 2g accurately weighed, in 10 ml of dilute hydrochloric acid and dilute to 50 ml with water, add 3 g of potassium iodide, allow to stand for ten minutes and titrate the liberated iodine with 0.1 N sodium thiosulphate. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.04822 g of $Fe(NH_4)(SO_4)_2 . 12H_2O$.

Ferric Ammonium Sulphate, solution of : An 8.0 percent w/v solution of ferric ammonium sulphate in water.

Ferric Chloride : $FeCl_3$.

Description : Greenish black crystals or a crystalline powder, free from the orange colour of the hydrated salt, which is readily acquired by exposure to atmospheric moisture.

Solubility : Soluble in water, yielding an orange coloured solution.

Ferrous Salt : Dissolve 1 g in 50 ml of water, add 1 ml of dilute hydrochloric acid and 1 ml of solution of potassium ferricyanide; no blue or green colour is produced.

Free chlorine : Dissolve 5 g in 10 ml of water and boil the solution : no blue colour is produced on a starch iodide paper exposed to the vapours.

Ferric Chloride, solution of : Contains not less than 14.25 percent and not more than 15.75 percent w/v of $FeCl_3$.

Description : A clear, yellowish brown liquid.

Assay : Dilute 2 ml with 20 ml of water, add 1 ml of sulphuric acid and 0.1 N potassium permanganate drop by drop until a pink colour persists for five seconds. Add 15 ml of hydrochloric acid and 2 g potassium iodide, allow to stand for three minutes and titrate with 0.1 N sodium thiosulphate. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.01622 g of $FeCl_3$.

Ferric Chloride, Test solution of : A 5.0 percent w/w solution of ferric chloride in water.

Ferric chloride, Acid solution of : Mix 60 ml glacial acetic acid with 5ml of sulphuric acid, add 1 ml of solution of ferric chloride, mix and cool.

Ferrous Sulphate : Of the Indian Pharmacopoeia.

Ferrous Sulphate Solution : A 2.0 percent w/v solution of Ferrous sulphate in freshly boiled and cooled water.

Ferrous sulphate solution must be freshly prepared.

Formaldehyde, solution of : Formaldehyde solution of the Indian Pharmacopocia.

Fuller's Earth : Of commerce,—

Hydrochloric Acid : Of the Homoeopathic Pharmacopoeia of India.

Hydrogen Peroxide, 30 percent solution of : A solution in water containing, approximately 30 percent w/v of H_2O_2 of reagent purity.

Hydrogen Sulphide : H_2S.

Prepared by the action of hydrochloric acid, diluted with an equal volume of water, on iron sulphide; the resulting gas is washed by passing through water.

Description : A colourless, poisonous gas, with a characteristic unpleasant odour.

Hydrogen Sulphide, Solution of : A recently prepared saturated solution of hydrogen sulphide in water.

Hypophosphorus Acid, Dilute : A solution in water containing approximately 10 percent w/v of Hypophosphorus acid of Indian Pharmacopoeia.

Iodohydroxyquinoline Sulphonic Acid (7—iodo-8 hydroxyquinoline-Sulphonic Acid: **$C_9H_6INO_4S$)**

Description : A yellow, crystalline powder. Slightly soluble in water and in alcohol.

Melting Range : 260° to 270° with decomposition.

Sensitivity : To 1 ml of a solution containing 0.025 mg of ferric chloride add 2 drops of hydrochloric acid and 1 drop hydrogen peroxide solution and mix. To this mixture add 0.1 ml of a solution of the sample (1 in 1000) : a green or bluish green colour is produced.

Residue on ignition : It yields not more than 0.2% of residue on ignition.

Indigo Carmine : Of the Indian Pharmacopoeia which may not comply with the test for Pyrogens.

Indigo Carmine, Solution of : A solution of indigocarmine in a mixture of 10 ml of hydrochloric acid and 990 ml of 20.0 percent w/v solution of nitrogen-free sulphuric acid in water, adjusted to comply with the following test : add 10 ml to a solution of 1.0 mg of

potassium nitrate in 10 ml of water, add rapidly 20 ml of nitrogen free sulphuric acid and heat to boiling-point; the blue colour is just discharged in one minute.

Iodine : Of the Homoeopathic Pharmacopoeia of India.

Iodine, Solution of : Dissolve 2.6 g of iodine and 3 g of potassium iodide in water to produce 100 ml.

Iodine Monochloride, Strong Solution of : Dissolve 6.44 g of potassium iodate, 10 g of potassium iodide in 75 ml of water, 75 ml of hydrochloric acid and shake until a clear solution is obtained; add 5 ml of chloroform and add 0.05 M potassium iodate, shaking vigorously, until the chloroform becomes colourless. Strong solution of iodine Monochloride should be kept in stoppered bottle, protected from light and store in a cool place.

Iron, Reduced : Contains not less than 80.0 percent of metallic iron, Fe.

Description : A fine, greyish-black powder, free from metallic luster and from gritty particles.
Solubility : Insoluble in water and in alcohol; almost completely soluble in dilute hydrochloric acid.

Assay : Shake in a stoppered flask for ten minutes about 0.25 g, accurately weighed, with a hot solution of (1.259) of copper sulphate in 20 ml of water; filter, rapidly and wash the filter with water; acidify the mixed filtrate and washing with sulphuric acid and titrate with 0.1 N potassium permanganate. Each ml of 0.1 N potassium permanganate is equivalent to 0.005585 g of Fe.

Iron, Metallic : Iron, reduced of the Homoeopathic Pharmacopoeia of India.

Lead : Plumbum Metallicum of the Homoeopathic Pharmacopoeia of India.

Lead Acetate : Of the Indian Pharmacopoeia.

Lead Acetate, Solution of : A 10.0 percent w/v solution of lead acetate in recently boiled water.

Lead Paper—Lead Acetate Paper : Pieces of thin white filter paper about 100 mm x 50 mm, soaked in solution of lead acetate and dried.

Magnesium Carbonate : Light Magnesium carbonate of the Indian Pharmacopoeia which complies with the following additional test.

Ammonia : Dissolve 0.50 g in 4 ml of dilute hydrochloric acid, boil to remove carbon dioxide and dilute with water to 95 ml, add 5 ml of solution of sodium hydroxide and allow to stand for one hour. Dilute 40 ml, of the clear liquid to 50 ml with water and add 2ml of alkaline solution of potassium mercur-iodide. Any yellow colour produced is not deeper than that produced by adding 2 ml alkaline solution of potassium mercuri-iodide to a mixture of 44 ml of water 2 ml of dilute solution of sodium hydroxide.

Magnesium Chloride : $MgCl_2$. $6H_2O$.

Description : Deliquescent crystals.

Solubility : Freely soluble in alcohol.

Sulphate : 1g complies with the limit test for sulphates.

Free acid or alkali : Dissolve 2g in 50 ml of carbon dioxide : free water. The solution requires, for neutralization to solution of bromothymol blue, not more, than 0.05 ml of 0.01 N sodium hydroxide or 0.05 ml of 0.01 N hydrochloric acid.

Magnesium Sulphate : Of the Indian Pharmacopoeia.

Magnesium Sulphate, Solution of : A 10.0 percent w/v solution of magnesium sulphate in water.

Manganese Dioxide : MnO_2

Contains not less than 70.0 percent of MnO_2.

Description : A black or brownish-black, powder. It is insoluble in water.

Chloride : Warm 1 g with 20 ml of water, 3 ml of nitric acid and 5 ml of solution of hydrogen peroxide until solution is complete; cool and dilute to 50 ml with water; the solution complies with the limit test for chlorides.

Assay : Place about 0.2 g accurately weighed, in a stoppered flask, add 50 ml of water, 3 g of potassium iodide and 10 ml of dilute hydrochloric acid and shake until solution is complete; titrate the librated iodine with 0.1 N sodium thiosulphate. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.004347 g of MnO_2.

Mannitol : Of the Indian Pharmacopoeia.

Mercuric Chloride : $HgCl_2$.

Contains not less than 99.5 percent of $HgCl_2$.

Description : Heavy, colourless or white, crystalline masses, or a white crystalline powder.

Solubility : Soluble, at 20° in 15 parts of water and in 3 parts of alcohol.

Non-Volatile matter : When volatilised, leaves not more than 0.1 percent of residue.

Assay : Dissolve about 0.3 g, accurately weighed, in 85 ml of water in a stoppered flask, add 10 ml of solution of calcium chloride, 10 ml of solution of potassium iodide, 3 ml of solution of formaldehyde and 15 of solution of sodium hydroxide and shake continuously for two minutes. Add 20 ml of acetic acid and 35 ml of 0.1 N iodine, shake continuously for about ten minutes or until the precipitated mercury is completely redissolved and titrate the excess of iodine with 0.1 N sodium thiosulphate. Each ml of 0.1 N iodine is equivalent to 0.01358 g of $HgCl_2$.

Mercuric Chloride, solution of : A 5.0 percent w/v solution of mercuric chloride in water.

Mercury : Of the Indian Pharmacopoeia.

Mercuric Iodide : Of the Homoeopathic Pharmacopoeia of India.

Mercurous Nitrate, Solution of : Dissolve 200 g of mercury in sufficient nitric acid and add water to produce 1000 ml. Solution of mercurous nitrate should be kept in a bottle containing a little mercury.

Metaphosphoric Acid, Solution of : A 20.0 percent w/v solution of metaphosphoric acid in water.

Solution of Metaphosphoric Acid must be freshly prepared.

Methyl Alcohol : Of the Indian Pharmacopoeia.

Methylaminophenol : 4-Methylaminophenol Sulphate $(CH_3NH_4C_6H_4OH)_2H_3SO_4$.

Description : A white or cream-coloured crystalline powder becoming darken on exposure to air.

Solubility : Slightly soluble in water.

Sulphated ash : Not more than 0.1 percent.

Nitric Acid, Dilute : (10 percent w/w of HNO_3). Dilute 106 ml of nitric acid with sufficient water to make 1000 ml.

Nitrobenzaldehyde : $NO_2C_6H_4CHO$.

Description : Yellow needles; odour, suggesting that of benzaldehyde. It is soluble in alcohol.

Melting Range : 40° to 45°.

Sulphated Ash : Not more than 0.1 percent.

Nitrobenzene : $C_6H_5NO_2$.

Description : A pale yellow liquid, odour, characteristic.

Solubility : Insoluble in water.

Boiling range : Not less than 95.0 percent distils between 210° and 212°.

Wt. Per ml : At 25°, about 1.20 g.

Oxalic Acid : $(CO_2H)_2. 2H_2O$.

Contains not less than 99.5 percent of $C_2H_2O_4.2H_2O$ as determined by both the parts of the Assay.

Description : Colourless crystals.

Solubility : Soluble in water and in alcohol.

Chloride : To 1 g dissolved in 20 ml of water add 5 ml of dilute nitric acid and 1 drop of solution of silver nitrate; no turbidity is produced.

Sulphated Ash : Not more than 0.5 percent.

Assay : (1) Dissolve, about 3 g accurately weighed, in 50 ml of carbon dioxide-free water and titrate with 1 N sodium hydroxide using solution of phenolphthalein as indicator. Each ml of 1N sodium hydroxide is equivalent to 0.06304 g of $C_2H_2O_4.2H_2O$.

(2) Dissolve about 3 g accurately weighed, in water and add sufficient water to produce 250 ml. To 25 ml of this solution add 5 ml of sulphuric acid previously diluted with a little water and titrate at a temperature of about 70° with 0.1 potassium permanganate. Each ml of 0.1 N potassium permanganate is equivalent to 0.006304 g of $C_2H_2O_4.2H_2O$.

Phosphoric Acid : Of the Indian Pharmacopoeia (approximately 88.0 percent w/w of H_3PO_4).

Phosphorus, Red :

Description : A Dark red powder, insoluble in water and in diluted acids.

Soluble matter : Heat 2 g with 30 ml of acetic acid on a water-bath for fifteen minutes, cool, dilute to 50 ml, filter, evaporate 25 ml of the filtrate on a water-bath and dry the residue at 100° for two hours; the residue weighs not more than 50 mg.

Yellow Phosphorus : Shake 5g with 20 ml of carbon di-sulphide in a glass stopper cylinder, filter and immerse in the filtrate a strip of filter paper, 10 cm by 0.5 cm previously immersed in solution of copper sulphate and allow to dry in the air; no stain is produced.

Loss on drying : When dried to constant weight over sulphuric acid, loses not more than 1 percent of its weight.

Platinum : Pt.—Of the H.P.I.

Potassium Bisulphate : $KHSO_4$.

Contains not less than 98.0 percent and not more than the equivalent of 102.0 percent of $KHSO_4$.

Description : Fused, white hygroscopic lumps.

Solubility : Very soluble in water giving an acid solution.

Assay : Dissolve about 4.5 g, accurately weighed, in 50 ml of water and titrate with 1 N sodium hydroxide, using solution of phenolphthalein as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.1362 g of $KHSO_4$.

Potassium Carbonate : K_2CO_3.

Contains not less than 98.0 percent of K_2CO_3.

Description : A white, granular, hydroscopic powder.

Solubility : very soluble in water, forming a clear solution.

Iron : 1 g with addition of 1.5 ml of hydrochloric acid, complies with the limit test for iron.

Chloride : 1 g with the addition of 5 ml of nitric acid, complies with the limit test for chlorides.

Sulphate : 1 g with the addition of 5 ml of hydrochloric acid, complies with the limit test for sulphates.

Assay : Dissolve about 3 g, accurately weighed, in 50 ml water and titrate with 1 N hydrochloric acid, using solution of methyl orange or solution of bromophenol blue as indicator. At the first colour change, boil the solution and cool and complete the titration. Each ml of 1 N hydrochloric acid is equivalent to 0.06911 g K_2CO_3.

Potassium Carbonate, Solution of : A 10.0 percent w/v solution of potassium carbonate in water.

Potassium Chromate, Solution : K_2CrO_4—A 5.0 percent w/v solution of Potassium chromate in water.

Potassium Cupri-tartrate, Solution of : (Fehling's solution)

(1) The copper sulphate solution : Dissolve 34.66 g of carefully selected small crystals of copper sulphate, showing no trace of efflorescence or of adhering moisture in sufficient water to make 500 ml. Keep this solution in small, well stoppered bottles.

(2) Alkaline Tartrate Solution : Dissolve 176 g of sodium potassium tartrate and 77 g of sodium hydroxide in sufficient water to produce 500 ml.

Mix equal volumes of the solutions No. 1 and No. 2 at the time of using.

Potassium Cyanide : KCN.

Contains not less than 95.0 percent of KCN.

Description : A white, crystalline powder, gradually decomposing on exposure to air.

Solubility : Readily soluble in water, forming a clear, colourless solution.

Heavy metals : To 20 ml of a 5.0 percent w/v solution in water, add 10 ml of solution of hydrogen sulphide; no darkening is produced immediately, or on addition of 5 ml of dilute hydrochloric acid.

Assay : Dissolve about 0.5 g, accurately weighed, in 50 ml of water, 5 ml of dilute ammonia solution and one drop of solution of potassium iodide; titrate with 0.1 N silver nitrate until a faint permanent turbidity appears. Each ml of 0.1 N silver nitrate is equivalent to 0.01302 g of KCN.

Potassium Cyanide, Solution of : A 10.0 percent w/v solution of potassium cyanide in water.

Potassium Dichromate : $K_2Cr_2O_7$.

Contains not less than 99.8 percent of $K_2Cr_2O_7$.

Solubility : Soluble in water.

Chloride : To 20 ml of a 5 percent w/v solution of water, add 10 ml of nitric acid, warm to about 50° and add a few drops of solution of silver nitrate; not more than a faint opalescence is produced.

Assay : Dissolve about 2 g, accurately weighed, in freshly boiled and cooled water and dilute to 150 ml. Transfer 25 ml of this solution to a glass stopped flask, add 2 g of potassium iodide and 10 ml hydrochloric acid and allow to stand in the dark for ten minutes. Add about 200 ml of freshly boiled and cooled water and titrate with 0.1 N sodium thiosulphate, using solution of starch, added towards the end of the titration as indicator. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.004904 g of $K_2Cr_2O_7$.

Potassium Dichromate, Solution of : A 9.8 percent w/v solution of potassium dichromate in water.

Potassium Ferricyanide, Solution of : Wash about 1 g of potassium ferricyanide in crystals with a little water and dissolve the washed crystals in 100 ml of water. Solution of Potassium ferricyanide must be freshly prepared.

Potassium Ferrocyanide : $K_4Fe(CN)_6.3H_2O$.

Contains not less than 99.0 percent of $K_4Fe(CN)_6.3H_2O$.

Description : A yellow crystalline powder, soluble in water.

Reaction : A 10.0 percent w/v solution in water is neutral to litmus paper.

Assay : Dissolve about 1 g accurately weighed in 200 ml of water, add 10 ml of sulphuric acid and titrate with 0.1 N potassium permanganate. Each ml of 0.1 N potassium permanganate is equivalent to 0.04224 g of $K_4Fe(CN)_6.3H_2O$.

Potassium Ferrocyanide, Solution of : A 5.3 percent w/v solution of potassium ferrocyanide in water.

Potassium Hydroxide : KOH—Of the Indian Pharmacopoeia.

Potassium Hydroxide, Alcoholic solution of : A solution of potassium hydroxide in alcohol containing 10.0 percent w/v of KOH.

Potassium Hydroxide, Solution of : Of the Indian Pharmacopoeia.

Potassium Iodate : KIO_3.

Contains not less than 99.8 percent of KIO_3, calculated with reference to the substance dried at 110° for one hour.

Description : A white, crystalline powder.

Solubility : Soluble in water.

Reaction : A 5 percent w/v solution in water is neutral to litmus paper.

Chorate : To 2g of the powdered salt add 2 ml of sulphuric acid; the salt remains white and no odour or gas is evolved.

Iodide : Dissolve 1 g in 20 ml of water, add 1 ml of 0.1N sulphuric acid and 2 ml of chloroform and shake vigorously; no violet colour appears in the chloroform layer.

Sulphate : Dissolve 1 g in 25 ml of water, add 10 ml of hydrochloric acid, heat nearly to boiling, add 1 ml of solution of barium chloride and allow to stand for ten minutes; no turbidity or precipitate is produced.

Loss on drying : When dried at 105° for one hour, loses not more than 0.1 percent of its weight.

Assay : Dissolve about 1.5g accurately weighed, in water and dilute to 250 ml. To 25 ml of this solution add 3 g of potassium iodide, 10 ml of hydrochloric acid and 10 ml of water and titrate with 0.1 N sodium thiosulphate. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.00356, g of KIO_3.

Potassium Iodate, Solution of : A 1.0 percent w/v solution of potassium iodate in water.

Potassium Iodide : Of the Indian Pharmacopoeia.

Potassium Iodide, Solution, of : A 10.0 percent w/v solution of potassium iodide in water.

Potassium Iodide and Starch, Solution of : Dissolve 10 g of potassium iodide in sufficient water to produce 95 ml and add 5 ml of solution of starch. Solution of potassium iodide and starch must be recently prepared.

Potassium Permanganate : Of the Indian Pharmacopoeia.

Potassium Permanganate, Solution of : A 1.0 percent w/v solution of potassium permanganate in water.

Potassium Thicyanate : KCNS.

Contains not less than 99.0 percent of KCNS, calculated with reference to the substance dried to constant weight at 105°.

Description : Colourless crystals. Deliquescent.

Solubility : Soluble in 0.5 part of water and in 15 parts of ethyl alcohol.

Alkalinity : A 10.0 percent w/v solution in carbon-dioxide-free water is not alkaline to solution of bromothymol blue.

Ammonia : Boil 1 g with 5 ml of solution of sodium hydroxide, no ammonia is evolved.

Chloride : Dissolve 1 g in a solution of 1g of ammonium nitrate in 30 ml of solution of hydrogen peroxide containing not more than 1 part per million of chloride, add 1 g of sodium hydroxide, gently warm and when the vigorous reaction subsides, add further 30 ml of the solution of hydrogen peroxide, boil for two minutes, cool, add 5 ml of nitric acid and 1 ml of solution of silver nitrate; any opalescence produced is not greater than that produced by treating 1 ml of 0.01 N hydrochloric acid in the same manner.

Sulphate : 0.5g complies with the test for sulphates.

Other sulphur compound : Dissolve 1g in 5 ml of water, add 2 ml of dilute hydrochloric acid and titrate with the 0.1 N iodine; not more than 0.5 ml of 0.1 N iodine is required.

Loss on drying : When dried to constant weight at 105°, loses not more than 2.0 percent of its weight.

Assay : Dissolve about 0.4 g accurately weighed in 50 ml of water, add 6 ml of nitric acid, 50 ml of 0.1 N silver nitrate, add 5 ml of solution of ferric ammonium sulphate and titrate the excess of silver nitrate with 0.1 N ammonium thiocynate. Each ml of 0.1 N silver nitrate is equivalent to 0.009718 g of KCNS.

Purified Water : Of the Homoeopathic Pharmacopoeia of India.

Selenium : Se.

Description : A dark red to greyish black fine powder.

Melting range : 200° to 222°.

Silicea : Of the Homoeopathic Pharmacopoeia of India.

Silver Ammonio-nitrate, Solution : Dissolve 2.5 g Silver nitrate in 80 ml of water and cautiously add dilute ammonia solution until the precipitate first formed is nearly dissolved; set aside; decant and add sufficient water to produce 100 ml.

Caution : Dry silver ammonium-nitrate is very explosive

Silver Nitrate : $AgNO_3$—of Homoeopathic Pharmacopeia of India.

Silver Nitrate, Solution of : A 5.0 percent w/v solution of silver nitrate in water.

Sodium Bicarbonate : of the Indian Pharmacopoeia.

Sodium Bicarbonate, Solution of : A 5.0 percent w/v solution of sodium bicarbonate in water.

Sodium Carbonate, Anhydrous : Na_2CO_3

Contains not less than 89.0 percent of Na_2CO_3.

Description : A white powder.

Solubility : Slowly soluble in water.

Chloride : 5 g with an additional 6 ml of nitric acid, complies with the limit test for chlorides.

Sulphate : Dissolve 2 g in 3 ml of hydrochloric acid and 50 ml of water, add 10 ml of solution of barium chloride and allow to stand for one hour; no turbidity is produced.

Assay : Dissolve about 3 g, accurately weighed in 50 ml of water and titrate with 1N hydrochloric acid using solution of methyl-orange or solution of bromophenol blue as indicator. At the first colour change, boil the solution, cool and complete the titration. Each ml of 1N hydrochloric acid is equivalent to 0.053g of Na_2CO_3.

Sodium Carbonate, Solution of : A 10.0 percent w/v solution of sodium carbonate in water.

Sodium Chloride : Of the Indian Pharmacopoeia.

Sodium Chloride, Solution of : (Synonym : Brine). A saturated solution of sodium chloride in water.

Sodium hydroxide : Of the Indian Pharmacopoeia.

Sodium Hydroxide, Solution of : A 20.0 percent w/v solution of sodium hydroxide in water.

Sodium Phosphate : Of the Indian Pharmacopoeia.

Sodium phosphate, Solution of : A 10.0 percent w/v solution of sodium phosphate in water.

Sodium Sulphide : $Na_2S.\ 9H_2O$.

Contains not less than 95.0 percent of $Na_2S.\ 9H_2O$.

Description : Moist, colourless crystals.

Solubility : Readily soluble in water forming a clear colourless solution.

Reaction : A solution in water is strongly alkaline.

Assay : Dissolve about 0.5 g, accurately weighed in 30 ml of recently boiled and cooled water in a glass stoppered flask, add, with constant shaking, 50 ml of 0.1 N iodine followed by 2

ml of hydrochloric acid and titrate the excess of iodine with 0.1 N sodium thiosulphate, using solution of starch as indicator. Each ml of 0.1 N iodine is equivalent to 0.01201 g of $Na_2S.9H_2O$.

Sodium Sulphide : Solution of (lead free)—A 10.0 percent w/v solution of sodium sulphide in water.

Sodium Sulphate : Of the Indian Pharmacopoeia.

Sodium Thiosulphate : $Na_2S_2O_3. 5H_2O$ of the Indian Pharmacopoeia.

Stannous Chloride, Solution of : Dilute 60 ml of hydrochloric acid with 20 ml of water; add 20 g of tin and heat gently until gas ceases to be evolved, add sufficient water to produce 100 ml, allowing the undissolved tin to remain with the solution.

Starch : Of the Indian Pharmacopoeia.

Starch Solution of : Triturate 0.5 g of soluble starch with 5 ml of water and add this with constant stirring, to sufficient water to produce about 100 ml, boil for a few minutes, cool and filter. Solution of starch must be recently prepared.

Sulphur : Of the Indian Pharmacopoeia.

Sulphuric Acid : Of the Indian Pharmacopoeia.

Sulphuric Acid, Dilute : Of the Indian Pharmacopoeia.

Sulphuric Acid, Fuming :

Contains approximately 85.0 percent w/w of total SO_3, equivalent to approximately 20.0 percent w/w of free SO_3.

Description : A colourless, or slightly coloured, viscous liquid.

Assay : Add about 1 ml, accurately weighed, to 50 ml of water. Titrate with 1 N sodium hydroxide using solution of methyl orange as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.04003 g of SO_3.

Sulphurous Acid : H_2SO_3.

Contains not less than 5.0 percent w/w of SO_2.

Description : A colourless solution with a pungent odour of sulphur dioxide.

Non-volatile matter : Evaporate to dryness and gently ignite; the residue weighs not more than 0.1 percent.

Assay : Place 2 ml in an accurately weighed glass stoppered flask containing 50 ml of 0.1 N iodine solution and weigh again. Titrate the excess of iodine with 0.1 N sodium thiosulphate. Each ml of 0.1 iodine is equivalent to 0.003203 g of SO_2.

Thioglycollic Acid : $HS.CH_2COOH$.

Contains not less than 89.0 percent w/v of $C_2H_4O_2S$ as described by both parts of the Assay described below.

Description : A colourless or nearly colourless liquid; odour strong and unpleasant.

Iron : Mix 0.1 ml with 50 ml. Of water and render alkaline with ammonia solution. No pink colour is produced.

Assay : (1) Dissolve about 0.4 g accurately weighed, in 20 ml of water and titrate with 0.1 N sodium hydroxide, using solution of cresol red as indicator. Each ml of 0.1 N sodium hydroxide is equivalent to 0.00921 g of $C_2H_4O_2S$.

(2) To the above neutralised solution, add 2 g of sodium bicarbonate and titrate with 0.1 N iodine. Each ml of 0.1 N iodine is equivalent to 0.00921 g of $C_2H_4O_2S$.

Tin : Sn (Stannum metalicum) of the Homoeopathic Pharmacopoeia of India.

Turmeric : Of the Indian Pharmacopoeia.

Turmeric Paper : Made by impregnating unglazed white paper with Turmeric Tincture.

Uranyl Acctate :

Description : A bright yellow, crystalline powder.

Alkali : Dissolve 2 g in 50 ml of water, heat to boiling and add dilute ammonia solution until precipitation is complete, filter, evaporate to dryness, moisten with sulphuric acid and ignite gently; the residue weighs not more than 6 mg.

Uranyl Zinc Acetate, Solution of : Dissolve 10 g of uranyl acetate by heating in 30 ml of water and 5 ml of acetic acid. Dissolve 30 g of zinc acetate by heating with 30 ml of water and 3 ml of acetic acid, mix the two solutions, cool and filter.

Water : Purified water of the Homoeopathic Pharmacopoeia of India.

Water, Ammonia free : Water which complies with the following additional test : To 50 ml add 2 ml of alkaline solution of potassium mercuri-iodide; no colour is produced.

Water, Carbon dioxide Free : Water which has been boiled vigourously for a few minutes and protected from the atmosphere, during cooling and storage.

Zinc, Granulated : Zn.

Description : Bright silver grey, metallic granules.

Iron : Dissolve 0.5 g in 3 ml of dilute hydrochloric acid, add 8 ml of water and one drop of 0.1 N potassium permanganate, mix, add 5 ml of a 57.0 percent w/v solution of ammonium thiocynate in water and 10 ml of mixture of equal volume of amyl alcohol and amyl acetate, shake vigorously and allow to separate; any colour produced in the upper layer is not greater than produced by treating 0.5 ml of standard solution of iron in the same manner.

Acid insoluble matter : Dissolve 5 g in a mixture of 20 ml of hydrochloric acid and 20 ml of water; the solution is clear, colourless and free from more than traces of insoluble matter.

Oxidisable impurities : Dissolve 10 g in a mixture of 50 ml of water and 15 ml of sulphuric acid in a vessel from which air is excluded and add 0.1 ml of 0.1 N potassium permanganate; the pink colour is not discharged within five minutes.

Zinc Powder : Zincum metallicum of H.P.I.

APPENDIX—II

SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Ammonia, 2 N :

Ammonia solution diluted with water to contain in 1000 ml of 34.06 g of NH_2.

Ammonium Thiocyanate, 0.1 N :

Ammonium Thiocyanate. Dissolve in water to contain, in 100 ml. 7.612 g of NH_4SCN.

Disodium ethylenediamine tetracetate, **0.05 M** :

Dissolve 10.6 g of disodium ethylenediamine tetracetate in sufficient water to make 1000 ml and standardise solution as follows :

Weigh accurately 0.2 g of calcium carbonate, transfer to a suitable container, add 50 ml of water and sufficient dilute hydrochloric acid to dissolve the carbonate and dilute with water to 150 ml. Add 15 ml of solution of sodium hydroxide, 40 mg of murexide indicator preparation and 3 ml of solution of napthol green B and titrate with disodium ethylenediamine tetracetate solution until the solution is deep blue in colour. Calculate the (100.1 V) molarity by formula w/(100.1V) where W is the weight of $CaCO_2$ in the sample of calcium carbonate taken and V is the volume in ml of disodium ethylenediamine tetracetate solution consumed.

Ferric Ammonium Sulphate, 0.1 N :

Ferric ammonium sulphate, dissolved in water to contain in 1000 ml ferric ammonium sulphate, equivalent to 5.505 g of Fe.

Ferrous Ammonium Sulphate, 0.1 N : *Ferrous ammonium sulphate*, dissolved in *water* to contain in 100 ml ferrous iron equivalent to 5.585 g of Fe.

Hydrochloric Acid, 1 N, 0.5 N, 0.1 N, 0.01 N :

Hydrochloric acid, diluted with water to contain in 1000 ml, the following quantities of HCl.

for 1 N	36.47 g HCl
for 0.5 N	18.23 g HCl
for 0.1 N	3.647 g HCl
for 0.01 N	0.3647 g HCl

Iodine, 0.1 N :

Iodine and potassium iodide, dissolved in water to contain in 1000 ml, the following quantities of I and KI.

for 0.1 N	12.69 g I and
	18.00 g KI

Potassium Iodate, 0.05 M :

Potassium iodate, dissolved in water to contain in 1000 ml, the following quantities of KIO_3.

for 0.05 M	10.70 g KIO_3

Potassium Permanganate, 0.1 N : Potassium permanganate, dissolved in water to contain in 1000 ml, the following quantities of $KMnO_4$.

for 0.1 N	3.161 g $KMnO_4$.

Silver Nitrate, 0.1 N :

Silver nitrate, dissolved in water to contain in 1000 ml, the following quantities of $AgNO_3$.

for 0.1 N	16.99 g $AgNO_3$

Sodium Hydroxide, 1 N, 0.1 N, 0.01 N :

Sodium hydroxide dissolved in water to contain in 1000 ml, the following quantities of NaOH

for 1 N	40.00 g NaOH
for 0.1 N	4.00 g NaOH
for 0.01 N	0.400 g NaOH

Sodium Thiosulphate, 0.1 N :

Sodium thiosulphate dissolved in water to contain in 1000 ml, the following quantities of $Na_2S_2O_3$. $5H_2O$.

for 0.1 N	24.02 g $Na_2S_2O_3.5H_2O$

Sulphuric Acid 1 N, 0.5 N, 0.1 N, :

Sulphuric acid, diluted with water to contain in 1000 ml, the following quantities of H_2SO_4.

for 1 N	49.04 g H_2SO_4
for 0.5 N	24.52 g H_2SO_4
for 0.1 N	4.904 g H_2SO_4

APPENDIX—III

(A) INDICATORS EMPLOYED IN VOLUMETRIC DETERMINATIONS AND IN pH DETERMINATIONS

Bromocresol Green, Solution of : Warm 0.1 g of bromocresol green with 2.9 ml of 0.05 sodium hydroxide and 5 ml of alcohol; after solution is effected, add a sufficient quantity of alcohol (20 percent) to produce 250 ml.

Bromophenol Blue : Tetrabromophenol sulphonaphthalein.

Bromophenol Blue, Solution of : Warm 0.1 g of bromophenol blue with 3.0 ml of 0.05 N sodium hydroxide and 5 ml of alcohol (90 percent); after the solution is effected, add a sufficient quantity of alcohol (20 percent) to produce 250 ml.

Bromothymol Blue : Dibromothymol sulphonaphthalein.

Bromothymol Blue, Solution of : Warm 0.1 g of bromothymol blue with 3.2 ml of 0.05 N sodium hydroxide and 5 ml of alcohol (90 percent); after the solution is effected, add sufficient alcohol (20 percent) to produce 250 ml.

Ferric Ammonium Sulphate, Solution of : A 10.0 percent w/v solution of ferric ammonium sulphate in water.

Ferrion, Solution of : (O-Phenanthroline) : A 1.5 percent solution in 1.5 percent ferrous sulphate solution, however, ferrous sulphate solution is to be freshly prepared. The colour changes from red to pale-green.

Litmus, Solution of : Boil 10 g litmus with 50 ml of alcohol (90 percent) for one hour and pour away the clear liquid; repeat this operation twice with 30 ml of alcohol (90 percent). Digest the washed litmus with 100 ml of water and filter.

Methyl Orange : Sodium 4 dimethylaminoazobenzebne-4'-sulphonate.

Methyl Orange, Solution of : A 0.04 percent w/v solution of methyl orange in alcohol (20 percent).

Methyl Red-4 : Dimethylaminoazobenzene-2-carboxylic acid.

Methyl Red, Solution of : Warm 25 mg of methyl red with 0.95 ml of 0.05 sodium hydroxide and 5 ml of alcohol (90 percent); after solution is effected add a sufficient quantity of alcohol (50 percent) to produce 250 ml.

Murexide Indicator Preparation : Add 0.4 g of murexide (Acid ammonium purpurate) to 40 g of powdered potassium sulphate and grind in a glass mortar to a homogeneous mixture.

Phenolphthalein : Forms a colourless solution in acid and weak alkaline solutions and gives a red colour in more strongly alkaline solutions.

Phenolphthalein, Solution of : A 1.0 percent w/v solution of phenolphthalein in alcohol.

Potassium Chromate, Solution of : A 5.0 percent w/v solution of potassium chromate in water.

Starch, Solution of : Triturate 0.5 g of starch, or 0.5 g of soluble starch, with 5 ml of water and add this to sufficient water to produce about 100 ml. Boil for a few minutes, with constant stirring, cool and filter.

Solution of starch must be recently prepared.

(B) pH RANGES AND COLOUR CHANGES OF INDICATORS

Indicator	pH range	Colour change
Bromophenol blue	2.8 to 4.6	Yellow to blue
Methyl orange	3.1 to 4.4	Red to Yellow
Bromocresol green	3.6 to 5.2	Yellow to blue
Methyl red	4.2 to 6.0	Red to yellow
Bromothymol Blue	6.1 to 7.6	Yellow to blue
Litmus	5.5 to 7.5	Red to blue
Phenophthalein	8.2 to 10.0	Colourless to red

(C) DETERMINATION OF pH VALUES

The pH value of an aqueous liquid may be defined as the common logarithum of the reciprocal of the hydrogen ion concentration expressed in g, per litre. Although this definition provides a useful practical means for the quantitative indication of the acidity or alkalinity of a solution, it is less satisfactory from a strictly theoretical point of view. No definition of pH as a measurable quantity can have a simple meaning which is also fundamental and exact.

The pH value of a liquid is determined potentiometrically by means of the glass electrode and a suitable pH meter.

The reagents used in the determinations are described below :

***Method* :**

Operate the pH meter and electrode system according to the manufacturer's instructions. Standardise the meter and electrodes with 0.05 M potassium hydrogen phthalate (pH 4.00) when measuring an acid solution, or with 0.05 M sodium borate when measuring an alkaline solution. At the end of a set of measurement, take a reading of the solution used to standardize the meter and electrodes. This reading should not differ by more than 0.02 from the original value at which the apparatus was standardised. If the difference is greater than 0.05, the set of measurements must be repeated. The pH/e.m.f. relationship of the particular glass electrode in use must be checked daily. It is as follows, standardise with 0.05 M potassium hydrogen phthalate and measure the pH value of 0.05 M sodium borate. When the reading is higher by 0.02 or more or lower by 0.05 or more than the appropriate value in the Table, correct the pH values of all solutions measured on that day, assuming the e.m.f. of the glass electrode cell to be linearly related to the pH value of the solution which it contains. Unless otherwise stated all solution must be brought to laboratory temperature prior to measurement. While the pH/temperature coefficient of 0.05 M potassium hydrogen phthalate may be neglected that of

0.05 M sodium borate must be taken into account in accordance with the value given in the Table. When measuring pH values above 10.0 make sure that the glass electrode is suitable for use at the alkaline and of the pH scale and apply any correction that is necessary.

TABLE

pH value of 0.05 M sodium borate

Temperature	10°	15°	20°	25°	30°
pH	9.29	9.26	9.22	9.18	9.14

Water used as the solvent in the determination of the pH of a solution in water having a pH of 5.5 to 7.0

SOLUTIONS OF STANDARD pH

Solutions from pH 1.2 to pH 2.2 are prepared by mixing 50 ml of 0.2 M potassium chloride with quantities of 0.2 N hydrochloric acid, specified in the following table and diluting with freshly boiled and cooled water to produce 200 ml : -

pH	ml of 0.2 N hydrochloric acid
1.2	64.5
1.4	41.5
1.6	26.3
1.8	16.6
2.0	10.6
2.2	6.7

Solution from pH 2.2 to pH 3.8 are prepared by mixing 50 ml of 0.2 M potassium hydrogen phithalate with the quantities of 0.2 N hydrochloric acid, specified in the following table and diluting with freshly boiled and cooled water to produce 200 ml : -

pH	ml of 0.2 N hydrochloric acid
2.2	46.70
2.4	39.60
2.6	32.95
2.8	26.42
3.0	20.32
3.2	14.70
3.4	9.90
3.6	5.97
3.8	2.62

Solutions from pH 4.0 to pH 6.2 are prepared by mixing 50 ml of 0.2 M potassium hydrogen phthalate with the quantities of 0.2 N sodium hydroxide, specified in the following table and diluting with freshly boiled and cooled water to produce 200 ml : -

pH	ml of 0.2 N sodium hydroxide
4.0	0.40
4.2	3.70
4.4	7.50
4.6	12.15
4.8	17.70
4.9	20.75
5.0	23.85
5.1	26.95
5.2	29.95
5.3	35.45
5.4	36.45
5.6	39.85
5.8	43.00
6.0	45.45
6.2	47.00

Solutions from pH 5.8 to pH 8.0 are prepared by mixing 50 ml of 0.2 M potassium hydrogen phosphate with the quantities of 0.2 N sodium hydroxide specified in the following table and diluting with freshly boiled and cooled water to produce 200 ml : -

pH	ml of 0.2 N hydrochloric acid
5.8	3.72
6.0	5.70
6.2	8.60
6.4	12.60
6.6	17.80
6.8	23.65
7.0	29.63
7.2	35.00
7.4	39.50
7.6	42.80
7.8	45.20
8.0	46.80

Solutions from pH 7.8 of pH 10.0 are prepared by mixing 50 ml of 0.2 M boric acid-potassium chloride with the quantities of 0.2 N sodium hydroxide, specified in the following table and diluting with freshly boiled and cooled water to produce 200 ml : -

pH	ml of 0.2 N sodium hydroxide
7.8	2.61
8.0	3.97
8.2	5.90
8.4	8.50
8.6	12.00
8.8	16.30
9.0	21.30
9.2	26.70
9.4	32.00
9.6	36.85
9.8	40.80
10.0	43.90

Solutions of Standard pH must be kept in glass stopped bottles of alkali-free glass preferably coated with paraffin internally.

APPENDIX—IV

DETERMINATION OF MELTING RANGE AND BOILING RANGE

(A) DETERMINATION OF MELTING RANGE

The melting-range of a substance is the range between the corrected temperature at which the substance begins to form droplets and the corrected temperature at which it completely melts, as shown by formation of a meniscus.

Apparatus :

(a) A capillary tube of soft glass, closed at one end and having the following dimensions :

(i) thickness of the wall, about 0.10 to 0.15 mm.

(ii) length about 10 cm or any length suitable for apparatus used.

(iii) internal diameter 0.9 to 1.1 mm for substances melting below 100° or 0.8 to 1.2 mm for substances melting above 100°.

Thermometers :

Accurately standardised thermometers covering the range 10° to 300°, the length of two degrees on the scale being not less than 0.8 mm. These thermometers are of the mercury-in-glass, solid-stem type; the bulb is cylindrical in shape and made of approved thermometric glass suitable for the range of temperature covered; each thermometer is fitted with a safety chamber. The smallest division on the thermometer scale should vary between 0.1° to 0.5° according to the melting point of the substance under test.

The following form of heating apparatus is recommended :

A glass heating vessel of suitable, construction and capacity fitted with suitable stirring device, capable of rapidly mixing the liquids.

Suitable liquids for use in the heating vessel :

Glycerin	Upto 150°
Sulphuric acid to which a small crystal of potassium nitrate or 4 drops of nitric acid per 100 ml has been added	Upto 200°
A liquid paraffin of sufficiently high boiling range	Upto 250°
Seasame oil	Upto 300°
30 parts of potassium sulphate, dissolved by heating in 70 parts of sulphuric acid	Upto 300°

Any other apparatus or method, preferably, the electric method may be used subject to a check by means of pure substances having melting temperature covering the ranges from 0° to 300° and with suitable intervals.

The following substances are suitable for this purpose :

Substance	Melting range
Vanillin	81° to 83°
Acetanilide	114° to 116°
Phenacetin	134° to 136°
Sulphanilamide	164° to 166.5°
Sulphapyridine	191° to 193°
Caffeine (Dried at 100°)	234° to 237°

PROCEDURE

Method I : Transfer a suitable quantity of the powdered and thoroughly dried substance to a dry capillary tube and pack the powder by tapping the tube on a hard surface so as to form a tightly packed column of 2 to 4 mm in height. Attach the capillary tube and its contents to a standardised thermometer so that the closed end is at the level of the middle of the bulb; heat in a suitable apparatus (preferably a round-bottom flask) fitted with an auxiliary thermometer regulating the rise of temperature in the beginning to 3° per minute. When the temperature reached is below the lowest figure of the range for the substance under examination, the heating of the apparatus is adjusted as desired; if no other directions are given, the rate of rise of temperature should be kept at 1° to 2° per minute. The statement ‘determined by rapid heating’ means that the rate of rise of temperature is 5° per minute during the entire period of heating.

Unless otherwise directed, the temperature at which the substance forms droplets against the side of the tube and the one at which it is completely melted as indicated by the formation of a definite meniscus are read.

The following emergent stem corrections should be applied to the temperature readings.

Before starting the determination of the melting temperature the auxiliary thermometer is attached, so that the bulb touches the standard thermometer at a point midway between the graduation for the expected melting temperature and the surface of the heating material. When the substance has melted, the temperature is read on the auxiliary thermometer. The correction figure to be added to the temperature reading of the standardised thermometer is calculated from the following formula : :

0.00015 N (T—t)

Where ‘T’ is the temperature reading of the standardised thermometer.

't' is the temperature reading of the auxiliary thermometer.

'N' is the number of degrees of the scale of the standardised thermometer between the surface of the heating material and level of mercury.

The statement "melting range, a° to b°" means that the corrected temperature at which the material forms droplets must be at least a° and that the material must be completely melted at the corrected temperature, b°.

Method II : The apparatus employed for this test is the same as described for method I except for such details as are mentioned in the procedure given below : -

Procedure : A capillary tube open at both ends is used for this test. Melt the material under test at as low a temperature as possible. Draw into the capillary a column of the material about 10 mm high. Cool the charged tube in contact with ice for at least 2 hours. Attach the tube to the thermometer by means of rubber band and adjust it in the heating vessel containing water, so that the upper edge of the material is 10 mm below the water level. Heat in the manner as prescribed in Method I until the temperature is about 5° below the expected melting point and then regulate the rate of rise of temperature to between 0.5° to 1° per minute. The temperature at which the material is observed to rise in the capillary tube is the melting temperature of the substance.

(B) DETERMINATION OF BOILING-RANGE

The boiling-range of a substance is the range of temperature within which the whole or a specified portion of the substance distils.

Apparatus :

The boiling-range is determined in a suitable apparatus, the salient features of which are described below :

(a) *Distillation flask* : The flask shall be made of colourless transparent heat-resistant glass and well annealed. It should have a spherical bulb having a capacity of about 130 ml. The side tube slopes downwards in the same plane, as the axis of the neck at angle of between 72° and 78°. Other important dimensional details are as under :

Internal diameter of neck	15 to 17 mm
Distance from top of neck to center of side tube	72 to 78 mm
Distance from the center of the side tube to surface of the liquid when the flask contains 100 ml liquid	87 to 93 mm
Internal diameter of side tube	3.5 to 4.5 mm
Length of side tube	97 to 103 mm

(b) *Thermometer* : Standardised thermometers calibrated for 100 mm immersion and suitable for the purpose and covering the boiling range of the substance under examination shall be employed; the smallest division on the thermometer scale may vary between 0.2° to 1.0° according to requirement.

(c) *Draught Screen* : A suitable draught screen, rectangular in cross section with a hard asbestos board about 6 mm thick closely fitting horizontally to the sides of the screen, should be used. The asbestos board shall have a centrally cut circular hole, 110 mm in diameter. The asbestos board is meant for ensuring that hot gases from the heat source do not come in contact with the sides or neck of the flask.

(d) *Asbestos Board* : A 150 mm square asbestos board 6 mm thick provided with a circular hole located centrally to hold the bottom of the flask, shall be used. For distillation of liquids boiling below 60° the hole shall be 30 mm in diameter; for other liquid it should be 50 mm in diameter. This board is to be placed on the hard asbestos board of the draught screen covering its 110 mm hole.

(e) *Condenser* : A straight water-cooled glass condenser about 50 cm long shall be used.

Procedure : 100 ml of the liquid to be examined is placed in the distillation flask and a few glass beads or other suitable substance is added. The bulb of the flask is placed centrally over a circular hole varying from 3 to 5 cm in diameter (according to the boiling range of the substance under examination), in a suitable asbestos board. The thermometer is held concentrically in the neck of the flask by means of a well fitting cork in such a manner that the bulb of the thermometer remains just below the level of the opening of the side-tube. Heat the flask slowly in the beginning and when distillation starts, adjust heating in such a manner that the liquid distils at a constant rate of 4 to 5 ml per minute. The temperature is read when the first drop runs from the condenser and again when the last quantity of liquid in the flask is evaporated.

The boiling ranges indicated, apply at a barometric pressure of 760 mm of mercury. If the determination is made at some other barometric pressure, the following corrections are added to the temperatures read :

K (760—p)

Where p is the barometric pressure (in mm) read on a mercury barometer, without taking into account the temperature of the air;

K is the boiling temperature constant for different liquids having different boiling ranges as indicated below : -

If the barometric pressure is below 760 mm of mercury, the correction is added to the observed boiling-range; if above the correction is substracted.

Observed Boiling range	'K'
Below 100°	0.04
100° to 140°	0.045
141° to 190°	0.05
191° to 240°	0.055
above 240°	0.06

The statement 'distils between a° and b°', means that temperature at which the first drop runs from the condenser is not less than a° and that the temperature at which the liquid is completely evaporated is not greater than b°.

Micro-methods of equal accuracy may be used.

APPENDIX—V

DETERMINATION OF REFRACTIVE INDEX

The refractive index of a substance is the ratio of the velocity of light in vacuum to its velocity in the substance. It may also be defined as the ratio of the sine of the angle of incidence to the site of the angle of refraction.

The refractive index of any substance generally varies with the wave-length of the refracted light and with the temperature.

In this pharmacopoeia, refractive indices are given for sodium light at the temperature specified in the text in a suitable apparatus.

APPENDIX—VI

DETERMINATION OF WEIGHT PER MILLILITRE AND SPECIFIC GRAVITY

Weight per Millilitre

Weight per milliliter of a liquid is determined by dividing the weight in air, expressed in grammes, of the quantity of the liquid which fills a pycnometer at 20° or 25° by the capacity of the pycnometer at 20° or 25° respectively, expressed in milliliters. The capacity of the pycnometer at these temperatures is ascertained from the weight in g of quantity of water required to fill the pycnometer. The following data are assumed : :

Wt. of 1 ml of water in air at

20°	0.99719 g
25°	0.99602 g

Ordinary deviations in the density of air do not affect the result of a determination significantly for pharmacopoeial purposes.

Specific Gravity

The specific gravity of a substance is the weight of a given volume of that substance at a stated temperature as compared with the weight of an equal volume of water at the same temperature, all weighing being taken in air. A suitable pycnometer may be used for the determination.

APPENDIX—VII

QUALITATIVE REACTIONS OF SOME COMMON SUBSTANCES AND RADICALS

Acetates : Acetates, when warmed with *sulphuric acid*, yield acetic acid which has a characteristic odour; when warmed with *sulphuric acid* and a small quantity of *alcohol*, they yield ethyl acetate, which has a characteristic odour.

Neutral acetates are decomposed by heating, yielding a characteristic acetous odour.

With neutral or slightly acid solutions of acetates, *solution of ferric chloride* gives a deep-red colour and the resulting liquid on boiling yields a reddish-brown precipitate. On adding *hydrochloric acid*, the red solution turns yellow. Acetates, when heated with calcium oxide, yield acetone, detected by the indigo blue colour obtained when the vapours impinge on filter paper, which has been moistened with a 2.0 percent w/o solution of *O-nitro benzaldehyde in alcohol*, dried and then moistened with solution of *sodium hydroxide*.

Aluminium : Solutions of aluminium salts yield with *dilute ammonia solution* or with *solution of ammonium sulphide*, a white gelatinous precipitate, soluble in *hydrochloric acid*, in acetic acid and in *solution of sodium hydroxide*, but nearly insoluble in *dilute solution of ammonia* and in solution of ammonium salts and quite insoluble in these solutions when the mixture is boiled.

Solution of aluminium salts to which have been added five drops of a freshly prepared 0.05 percent w/v solution of quinalizarin in a 1 percent w/v solution of *sodium hydroxide* heated to boiling, cooled and acidified with excess of *acetic acid*, yield a reddish-violet colour.

Ammonium Salt :-

Many ammonium salts volatilise, when strongly heated, leaving no residue. When they are heated with *solution of sodium hydroxide*, ammonia is evolved recognised by its odour, by its reaction on moist red *litmus paper* and by its ability to produce a black stain on filter paper impregnated with *solution of mercurous nitrate*.

Antimony :-

Slightly acid solutions of antimony compounds yield with *hydrogen sulphide* an orange-coloured precipitate soluble in *solution of sodium hydroxide*, in *solution of ammonium sulphide* and in warm *hydrochloric acid* with evolution of hydrogen sulphide but almost insoluble in *solution of ammonium carbonate*.

Solution of antimony compounds react with nascent hydrogen generated by the interaction of *granulated Zinc* and *dilute sulphuric acid* to yield stibine. A cold porcelain tile held in the flame of this gas acquires a dark metallic deposit, which is not appreciably dissolved by solution of chlorinated soda.

Solutions of antimony compounds acidified with *dilute nitric acid* and filtered if necessary, yield a white micro-crystalline precipitate with a 5.0 percent w/v solution of *Pyrogallol* in water.

Arsenic :-

Solution of arsenic compounds, containing hydrochloric acid, yield with *hydrogen sulphide* a yellow precipitate, soluble in *solution of sodium hydroxide,* in *solution of ammonium sulphide* and in *solution of ammonium carbonate,* but precipitated on the addition of *hydrochloric acid.* Solution of arsenic compounds, treated with nascent hydrogen generated by the interaction of *granulated zinc* and *dilute sulphuric acid,* yield arsine. A cold porcelain title held in the flame of this gas acquires a dark metallic deposit, which is readily dissolved by solution of *chlorinated soda*.

Solution of arsenic compounds yield with solution of stannous chloride, a brown precipitate.

Solution of arsenious compounds, treated, with nascent hydrogen generated by the interaction of *granulated zinc* and *solution of sodium hydroxide,* slowly yield hydrogen arsenide; this gas gives a black stain to a filter paper moistened with *solution of silver nitrate* and placed as a cap over the tube in which the test is being performed.

Arsenites :-

Solution of arsenites to which sodium bicarbonate has been added, decolorises *solution of iodine*.

Solution of arsenites yield a yellow precipitate with *solution of silver ammonium-nitrate*.

Barium :-

Solution of barium salts yield a white precipitate with dilute sulphuric acid. This precipitate is insoluble in hydrochloric acid and in nitric acid.

Barium salts impart a yellowish green colour to a non-luminous flame appearing blue when viewed through green glass.

Calcium :-

Solution of calcium salts yield with *solution of ammonium carbonate,* a white precipitate which after boiling and cooling the mixture, is insoluble in *solution of ammonium chloride*.

Solutions of calcium salts yield, with *solution of ammonium oxalate,* a white precipitate soluble in *hydrochloric acid* but insoluble in *acetic acid*.

With *solution of potassium chromate,* strong solution of calcium salts yield a yellow, crystalline precipitate on shaking, the precipitate being soluble on diluting well with *water* or on adding *acetic acid*.

Solutions of calcium salts yield no immediate precipitate with *solution of potassium ferrocyanide,* but on the addition of an excess of the reagent in the presence of an excess of ammonium chloride, yield a white precipitate.

Carbonate and Bicarbonates :-

Carbonates and bicarbonates effervesce with dilute acids liberating carbon-dioxide; the gas is colourless and produces a white precipitate in *solution of calcium hydroxide.*

Solutions of carbonates produce a brownish-red precipitate with *solution of mercuric chloride;* solution of bicarbonates produce a white precipitate.

Solutions of carbonates yield, with *solution of silver nitrate,* a white precipitate which becomes yellow on the addition of an excess of the reagent and brown on boiling the mixture. The precipitate is soluble in *dilute ammonia solution* and *dilute nitric acid*.

Solutions of carbonates produce, at room temperature a white precipitate with solution of *magnesium sulphate*. Solution of bicarbonates yield no precipitate with the reagent at room temperature but on boiling the mixture, a white precipitate is formed.

Solutions of bicarbonates, on boiling, liberate carbon-dioxide which produces a white precipitate in solution of *calcium hydroxide*.

Chlorides :-

Chlorides, when heated with *manganese dioxide* and *sulphuric acid,* yield chlorine, recognisable by its odour and by giving a blue colour with potassium iodide and solution of starch.

Solutions of chlorides yield, with *solution of silver nitrate,* a white, curdy precipitate soluble in *dilute ammonia solution* but insoluble in *nitric acid.*

Copper :-

Solutions of copper salts yield a brownish-black precipitate with *hydrogen sulphide* insoluble in *dilute hydrochloric acid* and *solution of sodium hydroxide,* almost insoluble in *solution of ammonium sulphide* but decomposed and dissolved by boiling *nitric acid*.

Solutions of copper salts, yield with *solution of sodium hydroxide,* almost insoluble in solution of ammonium sulphide but decomposed and dissolved by boiling nitric-acid.

Solutions of copper salts, yield with *solution of sodium hydroxide* a light blue precipitate which becomes brownish-black on boiling.

Solutions of copper salts yield with *solution of potassium iodide* a brownish precipitate and a brown aqueous liquid giving a deep blue colour with *solution of starch*.

Strong solutions of copper salts yield with *solution of ammonium thiocyanate* a black precipitate becoming white on the addition of *sulphurous acid*.

Solution of copper salts yield with *dilute ammonia solution,* a greenish blue precipitate which readily dissolves in excess of the precipitant, forming a deep blue solution.

Cupric salts in solution produce with *solution of potassium ferrocyanide* a reddish-brown precipitate or in a very dilute solution reddish-brown colour.

Gold :-

Metallic gold is soluble in mixture of 3 volumes of *hydrochloric acid* and one volume of nitric acid yielding a solution of chloroauric acid and is insoluble in concentrated mineral acids.

Solution of gold compounds yield, with *hydrogen sulphide*, a black precipitate insoluble in *dilute hydrochloric acid,* but soluble in *solution of ammonium polysulphide,* from which it is reprecipitated on the addition of *dilute hydrochloric acid*.

Auric compounds in neutral or weakly acid solution yield, with *solution of stannous chloride*, a purple colour and with *solution of hydrogen peroxide* and *solution of sodium, hydroxide*, a precipitate which appears brownish-black by reflected light and bluish-green by transmitted light.

Iodides :-

Iodides heated with *sulphuric acid* and *manganese dioxide* or *potassium dichromate* evolve violet vapours of iodine.

Solutions of iodides yield with *solution of silver nitrate,* a yellow curdy precipitate in soluble in *dilute ammonia solution* and in *dilute nitric acid*.

Solutions of iodides with *solution of potassium iodate* and *dilute acetic acid* liberate iodine, which colours chloroform reddish-violet and *solution of starch,* blue.

A small quantity of solution of chlorine added to solutions of iodides liberate iodine which colours chloroform reddish-violet and *solution of starch* deep blue.

Iron :-

Reactions common to Ferrous and ferric salts.

Solutions of iron salts in dilute hydrochloric acid after the addition of a sufficient quantity of *solution of potassium permanganate* to produce a faint pink colour, give with *solution of ammonium thiocyanate* a blood red colour, which is extracted by solvent ether, or amyl alcohol and which is discharged on the addition of *solution of mercuric chloride* or of phosphoric acid.

(a) Ferric Salts :-

Solutions of ammonium nitrosophenyl hydroxylamine in the presence of *hydrochloric acid* gives a reddish-brown precipitate soluble in solvent ether.

Solution of potassium ferricyanide produces a reddish-brown colour but not precipitate.

Solution of sodium hydroxide produces, in the absence of citrates and tartrates reddish-brown precipitate soluble in solution of citric acid in water or of tartaric acid in water.

Solutions of ferric salts, strongly acidified with *acetic acid,* give with a 0.2 percent w/v solution of 7-iodo-8-hydroxyquinoline-5, sulphonic acid in water, a stable green colour.

(b) Ferrous Salts :-

Solutions of ferrous salts when treated with the *solution of potassium ferrocyanide* produces a white, precipitate rapidly turning blue and insoluble in *dilute hydrochloric acid*.

Solution of ferrous salts when treated with the *solution of potassium ferrocyanide* produces a dark blue precipitate insoluble in *dilute hydrochloric acid* and decomposed by *solution of sodium hydroxide*.

Solution of sodium hydroxide produces a dull green precipitate which on filtering and exposing to the atmosphere, changes to a brownish colour.

Lead :-

Strong solutions of lead salts yield with *hydrochloric acid* a white precipitate soluble in boiling water and redeposited as crystals when the solution is cooled.

Solution of lead salts which are not very strongly acid yield with *hydrogen sulphide,* a black precipitate, insoluble in *dilute hydrochloric acid* and in *solution of ammonium sulphide* but soluble in hot *dilute nitric acid*.

Solutions of lead salts yield with *dilute sulphuric acid* a white precipitate almost insoluble in water, more nearly insoluble in *dilute sulphuric acid* and in alcohol (90 percent), but soluble in *dilute solution of ammonium acetate.*

Solution of lead salts yield with *solution of potassium iodide,* a yellow precipitate which dissolves on boiling and reprecipitates as glistening plates on cooling.

Solutions of lead salts yield with *solution of potassium chromate,* a yellow precipitate readily soluble in solution of *sodium hydroxide* and in hot *nitric acid,* sparingly *soluble in dilute nitric acid* and insoluble in *acetic acid*.

Solutions of lead salts to which has been added *solution of potassium cyanide* and made alkaline with *ammonia solution* produce a brick-red coloured lower layer on shaking with lead-free solution of diphenyl thiocarbazone.

Magnesium :-

Solutions of magnesium salts yield a white precipitate with *solution of ammonium carbonate,* especially on boiling but yield no precipitate in the presence of *solution of ammonium chloride.*

Solutions of magnesium salts yield a white crystalline precipitate with *solution of sodium phosphate* in the presence of ammonium salts and *dilute ammonia solution*.

Solution of magnesium salts yield with *solution of sodium hydroxide* a white precipitate insoluble in excess of the reagent but soluble in *solution of ammonium chloride.*

Mercury :-

Reaction common to mercurous and mercuric salts.

Hydrogen sulphide produces a black precipitate, insoluble in solution of *ammonium sulphide* and in boiling *dilute nitric acid*.

Bright copper foil immersed in a solution free from excess of nitric acid becomes coated with a deposit of mercury, which on rubbing becomes bright; the mercury may be volatilised from the foil by heat, obtained in globules. *Solution of stannous chloride* added in excess, gives white precipitate rapidly turning grey with excess of the reagent.

Mercuric Salts :-

Solution of sodium hydroxide yields a yellow precipitate.

Solution of potassium iodide added to a neutral solution produces a scarlet precipitate, soluble in excess of the precipitant and in a considerable excess of the *solution of the mercuric salt*.

Nitrates :-

Nitrates liberate red fumes when warmed with *sulphuric acid* and *copper*.

Solution of nitrates do not yield a brown colour with *solution of ferrous sulphate,* but when, to a mixture of the reagent and solution being tested, *sulphuric acid* is cautiously added to form a lower layer, a brown colour is produced, at the junction of the two liquids.

When solutions of nitrates are mixed eautiously with *sulphuric acid* and a crystal of brucine is added, a red colour is produced.

Solutions of nitrates previously boiled with *solution of sodium hydroxide* to free them from traces of ammonium compounds on boiling being with *zinc powder* and *solution of sodium hydroxide* liberate ammonia, detected by its action on moistened red litmus and by the darkening produced on a filter paper previously impregnated with solution of mercurous nitrate.

Phosphate :-

Solution of ortho-phosphates give the following reactions :-

Solution of silver ammonium-nitrate yields a light yellow precipitate, readily soluble in *dilute ammonia solution* and in cold *dilute nitric acid*.

Solution of magnesium ammonium-sulphate yields a white, crystalline precipitate.

Solution of ammonium molybdate with an equal volume of *nitric acid* yields on warming a yellow precipitate.

On adding to a dilute solution of a phosphate, one fifth of its volume of *solution of ammonium molybdate* with *sulphuric acid,* followed by one fifth of its volume of solution of methylamino phenol with sulphite and heating for 30 minutes in a water bath, a blue colour is produced.

Potassium :-

Potassium compounds moistened with *hydrochloric acid* and introduced on platinum wire into the flame of a Burner, gives a violet colour to the flame.

Moderately strong solution of potassium salts, which have been previously ignited to free them from ammonium salts, gives a white crystalline precipitate with perchloric acid.

Solution of potassium salts which have been previously ignited to free them from ammonium salts and from which iodide has been removed, give a yellow precipitate with *solution of sodium cobaltnitrite* and *acetic acid*.

Sodium :-

Sodium compounds moistened with *hydrochloric acid* and introduced on a platinum wire into the flame of a Bunsen Burner, give a yellow colour to the flame.

Solution of sodium salts yield, with solution of *uranyl zinc acetate,* a yellow crystalline precipitate.

Sulphates :-

Solutions of sulphates yield, with solution of barium chloride, a white precipitate insoluble in *hydrochloric acid*.

Solution of sulphates yield, with solution of *lead acetate*, a white precipitate soluble in *solution of ammonium acetate* and in *solution of sodium hydroxide*.

Tartrate :-

Tartrates, heated with *sulphuric acid* in boiling water-bath char rapidly, evolving Carbon monoxide and Carbon dioxide.

Neutral solutions of tartrates produce with excess of solution of Calcium chloride in the cold, a white, granular precipitate soluble in acetic acid.

Neutral solution of tartrates yield, with excess of solution of Calcium chloride in the cold a white granular precipitate soluble in acetic acid.

Neutral solutions of tartrates yield, with excess of *solution of silver nitrate,* a white precipitate soluble in *nitric acid* and *dilute ammonia solution,* the ammoniacal solution containing just enough ammonium hydroxide to dissolve the silver precipitate, on heating deposits metallic silver as a mirror on the side of the test tube.

On adding to a solution of Tataric acid in water or a tart rate acidified with acetic acid a drop of *solution of ferrous sulphate,* a few drops of *solution of hydrogen peroxide* and an excess of *solution of sodium hydroxide,* a purple or violet colour is produced.

Thiosulphates :-

Solutions of thiosulphates give with *hydrochloric acid* a white precipitate of sulphur which soon turns yellow and evolves sulphur dioxide, a colourless gas with a pungent smell of burning sulphur.

Strong solutions of thiosulphates give with *solution of barium chloride* a white precipitate which is soluble in *hydrochloric acid* with the separation of sulphur and evolution of sulphur dioxide.

Solution of thiosulphate decolorize, *solution of iodine* : the decolorised solution do not give the reactions for sulphates.

Solutions of thiosulphate decoloriced *solution of bromine* : the decolorised solution gives the reactions for sulphates.

Solutions of thiosulphate give with *solution of lead acetate* a white precipitate soluble in excess of the reagent; on boiling the suspension, a black precipilate is obtained.

Zinc :-

Natural solutions of zine salts yield with solution of *ammonium sulphide* or with *hydrogen sulphide* and *solution of sodium hydroxide,* a white precipitate soluble in *hydrochloric acid* but insoluble in acetic acid.

Solutions of zine salts yield with *solution of potassium ferrocyanide* a white or with precipitate insoluble in *dilute hydrochloric acid*.

Solutions zine salts acidified with *phosphoric acid* and mixed with 0.05 ml of 0.1 percent w/v solution of *copper sulphate* and 2 ml of *solution of mercuric ammonium thiocyanate* yield a violet precipitate.

APPENDIX—VIII

(A) LIMIT TESTS

Limit test for Chlorides

Dissolve the specified quantity of the substance in water or prepare a solution as directed in the text and transfer to a Nessler glass, Add 1 ml of nitric acid except when nitric acid is used in the preparation of the solution; dilute to 5 ml with water and and add 1 ml of solution of silver nitrate. Stir immediately with a glass rod and set aside for five minutes. The opalescence produced is not greater than the *standard Opalesence*.

Standard Opalesence : Measure 1 ml or the quantity specified in the monograph, 0.01 N hydrochloric acid and 1 ml of nitric acid into a Nessler glass. Dilute to 5 ml with water and add 1 ml of solution of silver nitrate. Stir immediately with a glass rod and set aside for five minutes.

Limit test for Iron

Dissolve the specified quantity of the substance in 40 ml of water or prepare a solution as directed in the text, add 2ml of a 20 percent w/v solution of iron free citric acid in water and 2 drops of thioglycolic acid, mix, make alkaline with iron free solution of ammonia, dilute to 5ml with water and allow to stand for five minutes. Compare the colour in a Nessler glass with the *standard colour,* by viewing transversely. The colour is not deeper than the *standard colour*.

Standard colour : Dilute 2 ml of standard solution of Iron with 40 ml of water, add 2 ml of a 20 percent w/v solution of iron free critic acid in water and 2 drops of thioglycolic acid mix, render alkaline with iron free solution of ammonia dilute to 5 ml with water and allow to stand for five minutes.

REAGENTS AND SOLUTIONS

Standard solution of iron : add 0.173 g of ferric ammonium sulphhate to 1.5 ml of hydrochloric acid and add sufficient water to produce 1000 ml 1 ml contains 0.02 mg of iron.

Iron-free Citric Acid :

Citric acid which complies with the following additional test : Dissolve 0.05 g in 40 ml of water, add 2 drops of thioglycolic acid, mix, make alkaline with iron-free solution of ammonia and dilute to 50 ml with water, no pink colour is produced.

Iron-free Hydrochloric Acid :

Hydrochloric acid which complies with the following additional test : Evaporate 5 ml on a water-bath nearly to dryness, add 40 ml of water, 2 ml of a 20 percent, w/v solution of iron-free citric acid in water and 2 drops of thioglycolic acid, mix, made alkaline with iron-free solution of ammonia and dilute to 50 ml with water, no pink colour is produced.

Iron-free solution of ammonia :

Dilute ammonia solution which complies with the following additional test : Evaporate 5 ml nearly to dryness on a water-bath add 40 ml ml of water, 2 ml of a 20 percent w/v solution of iron-free citric acid in water and 2 drops of thioglycolic acid, mix, make alkaline with iron-free solution of ammonia and dilute to 50 ml with water, no pink colour is produced.

Limit test for Sulphates :

Dissolve the specified quantity of the substance in water or prepare a solution as directed in the text and transfer to a Nessler glass, add 1 ml of hydrochloric acid, except when hydrochloric acid is used in the preparation of the solution, dilute to 50 ml with water and add 1 ml of solution of barium chloride. Stir immediately with a glass rod and set acids for five minutes. The turbidity produced is not greater than the standard turbidity.

(B) LIMIT TEST FOR ARSENIC

Select all the reagents used in this Test to have as low a content of arsenic as possible, so that a blank test results in either no strain or one that is barely discernible.

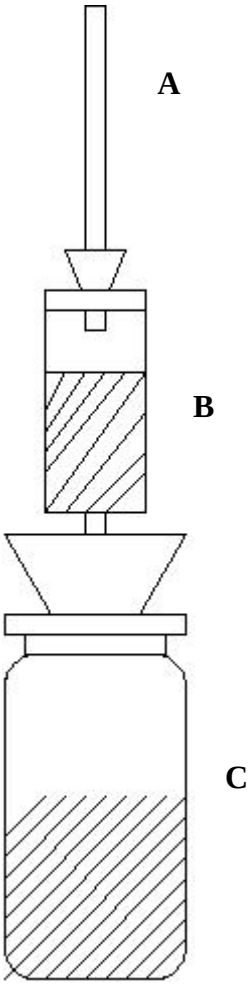


Fig. 1. Arsenic test apparatus

Apparatus : Prepare a generator (see the illustration) by fitting a perforated rubber stopper into wide mouth bottle of about 50 ml capacity. Through the perforation insert a vertical exit tube about 12 cm in total length and 1 cm in diameter along the entire upper portion (for about 8 cm) and constricted at its lower extremity to a tube about 4 cm in length and about 5 mm in diameter. The smaller portion of the tube should extend to just slightly below the stopper. Place washed sand or a pledged of purified cotton in the upper portion to about 3 cm from the top of the tube. Moisten the sand or cotton uniformly with mixture of equal volume, of lead acetate solution and water. Remove any excess or adhering droplets of lead acetate solution from the walls of the tube by applying gentle suction to the constricted end of the tube, into the upper end of this tube fit a second glass tube 12 cm in length, having an internal diameter of 2.5 to 3 mm, by means of a rubber stopper. Just before running the test, place a strip, of mercuric chloride test paper in this tube crimping the upper end of the strip so that it will remain in position about 2 cm above the rubber stopper. Clean and dry the tube thoroughly each time it is used.

Standard Arsenic Solution :

Dissolve 100 mg of arsenic trioxide that has been finally pulverised, dried over sulphuric acid and accurately weighed, in about 5 ml of sodium hydroxide solution (1 in 5) in a 1000 ml volumetric flask. Neutralise the solution with dilute sulphuric acid, add 10 ml more of dilute sulphuric acid, then add recently boiled water to volume. Pipette 10 ml of this solution into 1000 ml volumetric flask, add 10 ml of dilute sulphuric acid and then add recently boiled water to volume. Use this solution, which contains 1 mcg of arsenic trioxide in each ml in preparing the standard stain. Keep this solution in a glass stoppered bottle. Make fresh solution when new standard stains are to be prepared.

Test Preparation :

Add 1 ml of sulphuric acid to 5 ml of a solution of the chemical substance (1 in 25), unless otherwise quantity is directed in the monograph. Omit its addition entirely in the case of inorganic acids. Unless especially directed otherwise, add 10 ml of sulphurous acid. Evaporate the liquid in a small beaker, on a steam-bath, until it is free from sulphurous acid and has been reduced to about 2 ml in volume. Dilute with water to 5 ml to obtain the test preparation.

The Standard Stain :

Place in the generator bottle; 5 ml of potassium iodide solution, 2 ml of standard arsenic solution, 5 ml of acid stannous chloride solution and 28 ml of water. Add 1.5 g of granulated zinc (in No. 20 powder) and immediately insert the stopper containing the exit-tube. Keep the generator bottle immersed in water at 25° during the period of the test to moderate the reaction so that the stain will take the form of distinctive band to facilitate the comparison of colour intensity. When evolution of hydrogen has continued for 1 hour, remove the mercuric chloride test paper and place it in a clean, dry tube for comparison. This stain represents 2 mcg of arsenic trioxide. Since light, heat and moisture cause the stain to fade rapidly, make comparisons promptly. Stamped test papers may be preserved by dipping in melted paraffin or by keeping them over phosphorus pentoxide, protected from light.

Procedure :

Place in the generator bottle 5 ml of potassium iodide solution and 5 ml of Test preparation and add 5 ml of acid stannous chloride solution. Set the apparatus aside at room temperature for a period of 10 minutes, then add 25 ml of water and 1.5 g of granulated zinc (in No. 20 powder) and proceed as directed under the standard stain. Remove the mercuric chloride test paper and compare the stain upon it with the standard stain. The stain produced by the chemical test does not exceed the standard stain in length or intensity of colour indicating not more than 10 parts of arsenic trioxide per million parts of the substance being tested.

Interfering Chemicals

Antimony : if present in the substance being tested produces a grey stain.

Sulphites, sulphides; thiosulpahtes and other compounds that liberate hydrogen sulphide or sulphur dioxide when treated with sulphuric acid must be oxidised by means of nitric acid and then reduced by means of sulphur dioxide as directed under. The Preparation before they are placed in the apparatus.

(C) TEST FOR LEAD

Select all the reagents for this test to have as low a content as practicable and store all reagent solutions in containers of borosilicate glass. Rinse thoroughly all glassware with warm dilute nitric acid (1 in 2), followed by purified water.

Special Reagents :

Ammonium cyanide solution :

Dissolve 2 g of potassium cyanide in 15 ml of strong ammonia solution and dilute with water to 100 ml.

Ammonia citrate solution :

Dissolve 40 g of citric acid in 90 ml of water. Add 2 or 3 drops of phenol red solution, then cautiously add stronger ammonia solution until the solution acquires a reddish colour. Remove any lead that may be present by extracting the solution with 20 ml portions of Dithizone Extraction Solution (see below), until the dithizone solution retains its orange green colour.

Diluted standard Lead solution :

Dilute exactly 10 ml of standard lead solution, (Test for heavy metals containing 10 mcg of lead per ml) with sufficient dilute nitric acid (1 in 100) to make 100 ml. This solution contains 1 mcg of lead per ml.

Dithizone Extraction solution :

Dissolve 30 mg of dithizone in 1000 ml in chloroform and add 5 ml of alcohol. Store the solution in a refrigterator.

Before use, shake a suitable volume of the Dithizone extraction solution with about half its volume of dilute nitric acid (1 in 100), discarding the nitric acid.

Hydroxylamine Hydrochloride Solution :

Dissolve 20 g of hydroxylamine hydrochloride in sufficient water to make approximately 65 ml. Transfer to a separator, add a few drops of thymol blue indicator, then add stronger ammonia solution until the colour assumes a yellow colour. Add 10 ml of sodium diethyldithiocarbamate solution (1 in 25), mix and add, allow to stand for five minutes. Extract this solution with successive 10 to 15 ml portions of chloroform until a 5 ml portion of the chloroform extract does not assume a yellow colour when shaken with a dilute copper sulphate solution. Add diluted hydrochloric acid until the solution is pink (if necessary, add 1 or 2 drops more of thymol blue indicator) and then dilute with purified water to 100 ml.

Potassium Cyanide Solution :

Dissolve 50 g of potassium cyanide in sufficient purified water to make 100 ml. Remove the lead from this solution by extraction with successive portions of Dithizone Extraction solution, as described under Ammonium Citrate solution above, then extract any dithizone remaining in the cyanide solution by shaking with chloroform. Finally dilute the cyanide solution with sufficient water so that each 100 ml contains 10 g of potassium cyanide.

Standard Dithizone Solution :

Dissolve 10 mg of dithizone in 1000 ml of chloroform. Keep the solution in a glass-stoppered, lead-free bottle, suitably wrapped to protect it from light and store in a refrigerator.

Procedure : Transfer the volume of the prepared sample directed in the monograph to a separator and unless otherwise directed in the monograph add 6 ml of ammonium citrate solution, 2 ml of potassium cyanide solution and 2 ml of hydroxylamine hydrochloride solution (For the determination of lead in iron salts use 10 ml of ammonium citrate solution). Add 2 drops of phenol red solution and make the solution just alkaline (red in colour) by the addition of

stronger ammonia solution. Immediately extract the solution with 5 ml portions of Dithizone Extraction solution draining off each extract into another separator, until the dithizone solution retains its green colour. Shake the combined dithizone solutions for 30 seconds with 20 ml of dilute nitric acid (1 in 100) and discard the chloroform layer. Add to the acid solution 50 ml of standard Dithizone solution and 4 ml of ammonia cyanide solution and shake for 30 seconds, the colour of the chloroform layer is of no deeper shade of violet than that of a control made with a volume of *Diluted standard Lead solution* equivalent to the amount of Lead permitted in the sample under examination and the same quantities of the same reagents and in the same manner as the test with the sample.

(D) HEAVY METALS TEST

The Heavy Metals Test is designed to determine the content of those metallic impurities in official substances that are coloured by hydrogen sulphide under the conditions of the test. In substances the proportion of any such impurity is expressed as the quantity of lead required to produce a colour of equal depth as in a standard comparison solution, this quantity being stated as the Heavy Metals Limit expressed as parts of lead per million parts of the substance (by weight). Reagents and solutions used in this test are designated as 'Sp'.

Reagents

Dilute Acetic Acid Sp. :

Dilute acetic acid which complies with the following additional test : Evaporate 20 ml in a porcelain dish nearly to dryness on a water-bath. Add to the residue 2 ml of the acid and dilute with water to 25 ml; then add to 10 ml of solution of hydrogen sulphide. Any dark colour produced is not darker than a control made with 0.04 mg of Pb and 2 ml of the dilute acetic acid (2 parts per million).

Hydrochloric Acid Sp. :

Hydrochloric acid which complies with the following additional test : Evaporate 17 ml of the acid in a breaker to dryness on a water-bath. Dissolve the residue in 2 ml of dilute acetic acid Sp; dilute to 40 ml with water and add 10 ml of solution of hydrogen sulphide, any darkening produced is not greater than in a blank to which 0.02 mg of Pb has been added (1 part per million).

Acetic Acid Sp. :

Acetic acid which complies with the following additional test : Make 25 ml alkaline with dilute ammonia solution Sp., add 1 ml of solution of potassium cyanide Sp., dilute to 50 ml with water and add two drops of solution of sodium sulphide, no darkening is produced.

Dilute Ammonia Solution Sp. :

Dilute ammonia solution which complies with the following additional test : To 20 ml add 1 ml of solution of potassium cyanide Sp., dilute to 50 ml with water and add two drops of solution of sodium sulphide, no darkening is produced.

Solution of Hydrogen Sulphide : *See* Appendix I.(P: 198)

Stock Solution of Lead Nitrate :

Dissolve 159.8 mg of lead nitrate in 100 ml of water to which has been added 1 ml of nitric acid, then dilute to 1000 ml with water. This solution must be prepared and stored in glass containers free from soluble lead salts.

Standard Lead Solution :

Dilute to 10 ml of the stock solution of lead nitrate accurately measured, to 100 ml with water. This solution must be freshly prepared. Each ml of this standard lead solution contains the equivalent of 0.01 mg of lead. When 0.1 ml of standard lead solution is employed to prepare the solution to be compared with a solution of 1 g of the substance being tested, the comparison solution thus prepared contains the equivalent of 1 part of lead per million parts of the substance being tested.

Bromide Solution Sp. :

Bromine	30 g
Potassium bromide	30 g
Water, sufficient to produce	100 ml

Dissolve and mix. Evaporate 10 g in a porcelain dish to dryness on a water-bath. Add 10 ml of water and again evaporate to dryness. Repeat the process till all the bromine is driven off. Add 10 ml of water and 2 ml of dilute acetic acid Sp. And make up to 25 ml with water. Add 10 ml of solution of hydrogen sulphide; the resulting solution is not darker than a blank to which 0.01 mg of Pb has been added.

Procedure for Testing Chemicals :

Solution A : Introduce into a 50 ml Nessler tube 2 ml of dilute acetic acid Sp. and exactly the quantity of the standard lead solution containing the lead equivalent of the heavy metals limit specified for the substance to be tested and make up to 20 ml with water.

Solution B : This consists of 25 ml of solution prepared for this test according to the specific directions in each monograph.

Transfer solution A and B to matching 50 ml Nesslers tubes and add 10 ml of solution of hydrogen sulphide to each tube, mix, allow to stand for ten minutes then view downwards over a white surface, the column of Solution B is no darker than that of Solution A.

APPENDIX—IX

(A) DETERMINATION OF ASH

Take about 2 or 3 g, accurately weighed of the ground drug in a tared platinum or silica dish previously ignited and weighed. Scatter the ground drug in a fine even layer on the bottom of the dish. Incinerate by gradually increasing the heat, not exceeding dull red heat until free from carbon, cool and weigh. If a carbon-free ash cannot be obtained in this way, exhaust the charred mass with hot water, collect the residue on an ashless filter-paper, incinerate the residue and filter paper, add the filtrate, evaporate to dryness and ignite at a low temperature. Calculate the percentage of ash with reference to the air-dried drug.

(B) DETERMINATION OF SULPHATED ASH

Take about 2 or 3 g of the drug, accurately weighed, moisten with sulphuric acid, ignite gently, again moisten with sulphuric acid, re-ignite, cool and weigh. Calculate the percentage of sulphated ash with reference to the air-dried drug.

(C) DETERMINATION OF RESIDUE ON IGNITION

Take a quantity of the powered substance which may be expected to yield a residue of about 0.001g. weigh accurately and proceed as directed for the ‘Determination of Ash’ as mentioned above.

(D) DETERMINATION OF WATER SOLUBLE ASH

Boil the ash for five minutes with 25 ml of water; Collect the insoluble matter in a Gooch crucible, or on an ashless filter-paper; wash with hot water and ignite to constant weight, at a low temperature. Subtract the weight of insoluble matter from the weight of the ash; the difference in weight represents the water-soluble ash. Calculate the percentage of water-soluble ash with reference to the air-dried drug.

APPENDIX—X

MOISTURE CONTENT

(A) DETERMINATION OF MOISTURE CONTENT FOR CHEMICALS

Gravimetric Method :

Loss on Drying : Unless otherwise directed in the monograph, conduct the determination on 1 to 2 g of the sample, accurately weighed. If the sample is in the form of large crystals, reduce the particle size to about 2 mm by quickly crushing. Tare a glass-stoppered, shallow weighing bottle that has been dried for 30 minutes under the same conditions to be employed in the determination. Put the sample in the bottle, replace the cover and weigh the bottle and the contents. By gentle, sidewise shaking distribute the sample as evenly as practicable to a depth of about 5 mm generally and not over 10 mm in the case of bulky materials. Place the loaded bottle in the drying chamber, removing the stopper and leaving it also in the chamber and dry the sample at the temperature and for the time specified in the monograph. Upon opening the Chamber, close the bottle promptly and allow it to come to room temperature before weighing.

If the substance melts at a lower temperature than that specified for the determination of Loss on drying, expose the bottle with its contents for 1 to 2 hours to a temperature 5° to 10° below the melting temperature, then dry at the specified temperature.

(B) DETERMINATION OF MOISTURE CONTENT FOR VEGETABLE PRODUCTS

Procedure set forth here determines the amount of volatile matter (i.e., water drying off from the drug). For substances appearing to contain water as the only volatile constituent the procedure given below, is appropriately used.

Place about 10g of drug (without preliminary drying) after accurately weighing (accurately weighed to within 0.01 g) it in a tared evaporating dish. For example, for underground or unpowered drugs, prepare about 10 g. of the “Official-Sample” (also see method of Official-sampling) by cutting, shredding, so that the parts are about 3 mm in thickness.

Seeds and fruits smaller than 3 mm should be cracked. Avoid the use of high speed mills in preparing the samples and exercise care that no appreciable amount of moisture is lost during preparation and that the portion taken representative of the Official sample. After placing the above said amount of the drug in the tared evaporating dish, dry at 105° for 5 hours and weigh. Continue the drying and weighing at one hour interval until difference between two successive weighing corresponds to not more than 0.25 percent. Constant weight is reached when two consecutive weighing after drying for 30 minutes and cooling for 30 minutes in an desiccator, show not more than 0.01 g difference.

Method of Official sampling :

It is recommended that gross sample of vegetable drugs in which the component parts are over 1 cm in any dimension be taken by hand. When the total weight of the drug to be sampled is less than 100 kg, at least 500 g shall constitute an Official-sample and this shall be taken from

different parts of the container, or containers. When the total weight of the drug to be sampled is in excess of 100 kg., several samples shall be taken by means of a sample that removes a core from top to the bottom of the container and mixed and quartered, two of the diagonal quarters being rejected and the remaining two quarters being combined and carefully mixed and again subjected to a quartering process in the same manner until two of the quarters weigh not less than 500 g which later quarters shall constitute an official-sample.

When the total weight of the drug to be sampled is less than 10 kg., it is recommended that the above described method be followed, but that somewhat smaller quantities be withdrawn and in no case shall be the final Official-sample weigh less than 125 g.

The word “Official-sample” used is synonymous with the “Pharmacopoeial.” The correct sampling is an essential part or a link of a procedure towards correct standardisation.

APPENDIX—XI

(A) DETERMINATION OF ALCOHOL-SOLUBLE EXTRACTIVE

Mascerate 5g of the air-dried drug, coarsely powdered, with 100 ml of *alcohol* of the specified strength in a closed flask for twenty four hours shaking frequently during six hours and allowing to stand for eighteen hours. Filter rapidly taking precautions against loss of alcohol, evaporate 25 ml of the filtrate to dryness in a tared flat-bottomed, shallow dish, dry at 105° and weigh. Calculate the percentage of alcohol-soluble extractive with reference to the air-dried drug.

(B) DETERMINATION OF WATER-SOLUBLE EXTRACTIVE

Method I : Proceeds as directed for the determination of alcohol soluble extractive using *chloroform water* instead of alcohol.

Method II : Add 5g to 50 ml of *water* at 88° in a stoppered flask. Shake well and allow to stand for ten minutes; cool to 15° and add 2 g of Kieselguhr filter. Transfer 5 ml of the filtrate to a tared evaporating basin 7.5 cm in diameter, evaporate the solvent on a water-bath, continue drying for half an hour, finally dry in a steam oven for two hours and weigh the residue. Calculate the percentage of water soluble extractive with reference to the air-dried drug.

(C) DETERMINATION OF TOTAL SOLIDS

The term ‘total solids’ is applied to the residue obtained when the prescribed amount of the preparation is dried to constant weight under the conditions specified below :-

Apparatus : Shallow, flat bottomed flanged dishes about 75 mm in diameter and about 25 mm deep, made of nickel or other suitable metal of high heat conductivity and which is not affected by boiling water.

Method : Weigh accurately or measure an accurate quantity of the preparation approximately equal to the quantity stated in the Table and place in a tared dish, evaporate at as low a temperature as possible until the alcohol is removed and heat on a water-bath until the residue is apparently dry. Transfer to an oven and dry to constant weight at 105°. Owing to the hygroscopic nature of certain residues, it may be necessary to use dishes provided with well-fitting covers and to cool in an efficient desiccator.

APPENDIX—XII

QUANTITATIVE DETERMIANTION OF ALCOHOL IN PHARMACEUTICAL PREPARATIONS

I. Measure a definite quantity of the test liquid into round-bottomed 200 to 250 ml flask. If the liquid contains upto 20 percent of alcohol take for determination 75 ml; from 20 to 50 percent, 50 ml and from 50 percent and more, 25 ml.

In the case, the test liquid contains volatile matter it should undergo a preliminary treatment viz., if the liquid contains volatile acids, neutralize them with an alkali solution; if it contains volatile bases neutralize them with phosphoric or sulphuric acid.

Liquids containing free iodine are treated, before distillation with zinc in form of powder or with a small quantity of dry sodium thio-sulphate until decolourization of the liquid. To bind the volatile sulphurous compounds add some drops of sodium hydroxide solution.

In case, the test liquid contains ether, essential oils, chloroform, camphor etc., add in a separating funnel an equal volume of saturated sodium chloride solution and an identical volume of petroleum ether (b.p. 40° to 50°). Shake the mixture for 2 to 3 minutes. Wait until the layers have separated, the aqueous alcohol layer into another separating funnel and treat once more with half the quantity of petroleum ether. Run the alcohol-water layer into a distillation flask and shake the combined petroleum ether liquids with half the quantity of saturated sodium chloride solution, which is then added to the liquid in the distillation flask. Draw in air through the liquid for half a minute to remove the last traces of petroleum ether.

If the liquid contains less than 30 percent of alcohol, the salting out should be done with dry sodium chloride using 10 g instead of its solution.

Before distillation, dilute the test liquid with water to a total volumes of 75 ml.

Use tightly fitting rubber stoppers for the distillation flask and condenser. The receiver should be immersed in a vessel with cold water.

To ensure uniform boiling, place in the flask containing the liquid-some capillaries, pumice-stone or small pieces of porcelain.

If the liquid foams vigorously, when distilled, add phosphoric or sulphuric acid (2 to 3 ml) or calcium chloride, paraffin or wax (2 to 3 g).

Collect 48 ml of the distillate in the receiver (50 ml volumetric flask), being its temperature to 20° and make up with water to the mark. The distillate must be clear or slightly turbid.

Specific gravity of the distillate is determined pyknometrically and corresponding alcohol contents in percent by volume read off in the alcoholometric tables.

Calculate the alcohol content of the preparation in percent by volume from the formula

$$X = \frac{50a}{b}$$

Where ‘X’, alcohol contents of the preparation.

‘50’, volume of the distillate in milliliters,

‘a’, alcohol contents of the distillate.

‘b’, volume of the test liquid taken for distillation.

II. The determination of alcohol content of tinctures is also carried out by the boiling point temperature. This procedure is based on the fact that the temperature of tinctures at boiling differs very little from the boiling point of the corresponding aqueous alcohol solution.

The apparatus for determination of the boiling point of tinctures consists of a vessel for boiling (1), a tube with a side branch (2), a condenser (3) and a laboratory mercury thermometer with scale division of 0.1° covering the range from 50° to 100°, (4) (figure 2).

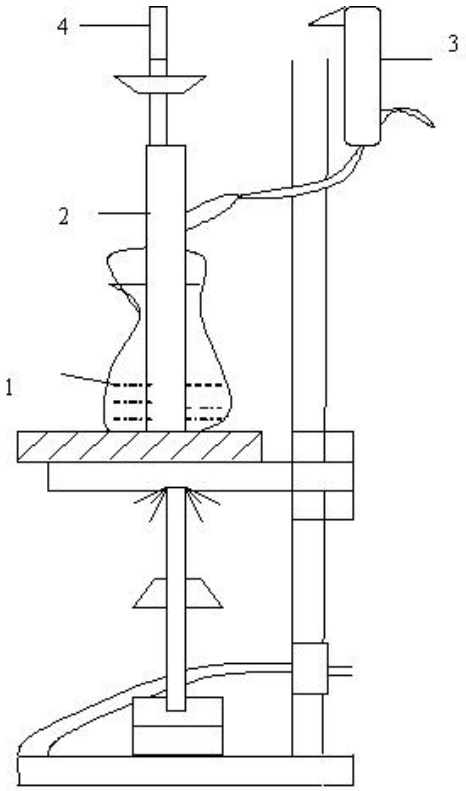


Fig. 2 : *Apparatus for quantitative determination of alcohol*

Pour 40 to 50 ml of the tincture into a vessel for boiling; ensure uniform boiling; add some small pieces of ignited porcelain or pumice-stone. The thermometer is to be inserted in the tube so that the mercury bulb should be immersed into the liquid for more than its half.

Heat continuously on a wire-gauge using a micro-burner or an electric stove with a rheostat. When the tincture has reached a temperature of 60° to 70° continue to heat slowly.

5 to 10 minutes after the beginning of boiling when the temperature of the tincture becomes constant, read off the temperature with an accuracy to within 0.1°.

Bring the result received to a standard pressure. If the barometer readings differ from the standard pressure (760 mm), a correction should be introduced for the difference between the observed and standard pressures, namely 0.1° for every 2.7 mm. At pressure below 760 mm the correction is to be added to the observed temperature and at pressures above 760 mm, is to be substracted.

The alcohol content is determined in percent by volume according to billing-point given in the table shown below.

Table for the determination of alcohol concentration in aqueous alcohol mixtures according to boiling point at standard pressure (760 mm) :

ALCOHOL TABLE							
Boiling point °C	Percent of alcohol by volume	Boiling point °C	Percent alcohol by volume	Boiling point °C	Percent of alcohol by volume	Boiling point °C	Percent of alcohol by volume
99.3	1	87.1	25	82.9	49	80.5	73
98.3	2	86.8	26	82.8	50	80.4	74
97.4	3	86.6	27	82.7	51	80.3	75
96.6	4	86.4	28	82.6	52	80.2	76
96.0	5	86.1	29	82.5	53	80.1	77
95.1	6	85.9	30	82.4	54	80.0	78
94.3	7	85.6	31	82.3	55	79.9	79
93.7	8	85.6	32	82.2	56	79.8	80
93.0	9	85.2	33	82.1	57	79.7	81
92.5	10	85.0	34	82.0	58	79.6	82
92.0	11	84.9	35	81.9	59	79.5	83
91.5	12	84.6	36	81.8	60	79.45	84
91.1	13	84.4	37	81.7	61	79.4	85
90.7	14	84.3	38	81.6	62	79.3	86
90.5	15	84.2	39	81.5	63	79.2	87
90.0	16	84.1	40	81.4	64	79.1	88
89.5	17	83.9	41	81.3	65	79.0	89
89.1	18	83.8	42	81.2	66	78.85	90
88.8	19	83.7	43	81.1	67	78.8	91
88.5	20	83.5	44	81.0	68	78.7	92
88.1	21	83.3	45	80.9	69	78.6	93
87.8	22	83.2	46	80.8	70	78.5	94
87.5	23	83.1	47	80.7	71	78.3	95
87.2	24	83.0	48	80.6	72		

APPENDIX—XIII

POWDERS AND SIEVES

Powders

The degree of coarseness or fineness of a powder is differentiated and expressed by the size of the mesh off sieve through which the powder is able to pass.

The following terms are used in the Description of powders :

Coarse Power (10/44) : A powder of which all the particles pass through a No 10 sieve and not more than 40.0 percent through a No 44 sieve.

Moderately Coarse powder (22/60) : A powder of which all the particles pass through a No. 22 sieve and not more than 40.0 percent through a No 60 sieve.

Moderately Fine powder (44/85) : A powder of which all the particles pass through a No 44 sieve and not more than 40.0 percent through a No. 85 sieve,

Fine Powder (85) : A powder of which all the particles pass through a No. 85 sieve.

Very Fine powder : A powder of which all the particles pass through a silky sieve in which not less than 120 mesh are included in a length of 2.54 cm in each transverse direction parallel to the threads.

When the fineness of a powder is described by means of a number, it is intended that all the particles of the powder shall pass through the sieve distinguished by that number.

When a batch of a vegetable drug is being ground and sifted, no portion of the drug shall be rejected; but it is permissible to withhold, the final tailings, if an approximately equal amount of tailings from a preceding batch of the same drug has been added before grinding.

Sieves

The wire sieves, used in sifting powdered drugs, are distinguished by numbers which indicate the number of meshes included in a length of 2.54 cm in each transverse direction parallel to the wires.

The sieves are made of wires of uniform circular cross-section, in accordance with the following specifications :

SIEVES

Wire Mesh

Number of Sieve	Nominal size of Aperture in mm	Nominal Diameter of Wire in mm	Standard Wire guage	Approximate Screening Area	Aperture Tolerence Average
				percent	percent
1	2	3	4	5	6
6	3.812	1.422	17	44	3.2
8	2.057	1.118	18.5	42	3.3
10	1.676	0.864	20.5	44	3.3
22	0.699	0.457	26	36	4.0
25	0.599	0.417	27	35	4.2
30	0.500	0.345	29	35	4.4
36	0.422	0.284	31.5	36	4.6
44	0.353	0.224	34.5	38	4.8
60	0.251	0.173	37	35	5.3
85	0.178	0.122	40	35	6.9
100	0.152	0.102	42	36	6.2
200	0.076	0.051	47	36	8.0

Perforated plate

Nominal size of Aperture in mm	Plate	Thickness	Nominal width of Bridge in mm	Screening Area	Aperture Tolerence Average Percent
	B.G.	mm		Percent	
7.94	18	1.257	2.8	55	0.58

APPENDIX—XIV

STANDARDS OF VEHICLES USED FOR EXTERNAL APPLICATIONS

Almond Oil

Synonym : Expressed Almond oil.

Almond oil is the fixed oil obtained by pressure from the kernels of varieties of Prunus amygdalus Batsch (Family-Rosaceae), without the application of heat.

Description : A pale-yellow, non-drying oil; odour slight and characteristic; taste, bland and nutty. It is slightly soluble in alcohol; miscible with solvent ether and with chloroform. Its specific gravity is 0.915 at 20°. It is composed mainly of olein with some linolein but no stearin present.

Identification : (a) It remains clear after exposure to a temperature of –10° for three hours, does not congeal until the temperature has been reduced to about – 18°.

(b) Refractive Index : 1,470 to 1,473 at 20°.

(c) Acid Value : Not more than 4.0.

(d) Iodine Value : 95 to 102 (iodine monochloride method).

(e) Saponification Value : 188 to 196.

Apricot kernel oil and reach-kernel oil : Shake 5 ml vigorously for one minute with 1 ml of a freshly prepared mixture of equal parts by weight of sulphuric acid, fuming nitric acid and water, kept cool while cautiously mixed; after fifteen minutes the whitish mixture produced shows no pink colour.

Arachis oil : It responds to the test for the absence of arachis oil in other oils.

Cottonseed oil : It responds to the test for the absence of cottonseed oil in other oils.

Sesame oil : It responds to the test for the absence of sesame in other oils.

Storage : It should be kept in well-filled, well-closed container.

Bees-Wax

Synonym : Cera Flava

Yellow bees-wax is secretion formed by the hive-bee. Apis mellifica L and possibly other species of Apis (Family-Apidae) and is used by the insect to form the cell, of the honeycomb. After extraction of the honey, the wax is melted with water separated and strained.

Description : A yellow to greyish brown solid; odour, honey like; faint and characteristic, somewhat brittle when cold but becoming plastic when warm. It is insoluble in water; sparingly

soluble in cold alcohol; completely soluble in chloroform, ether and fixed and volatile oils. Its melting point is 62° to 65°. Contains 70.0 percent of esters, the chief being myricyl palmitate.

Identification : (a) Acid Value : 17 to 23; determined by the following method.

Dissolve about 5 g accurately weighed, in 20 ml of boiling dehydrated alcohol previously neutralised to phenolphthalein solution and titrate with 0.5 N alcoholic potassium hydroxide using phenolphthalein solution as indicator.

(b) Iodine Value : 8 to 11 (Iodine monochloride method).

Fats

Fatty acids, Japan Wax and resin : Boil 5.0 g for 10 minutes with 40 ml of sodium hydroxide solution and 40 ml of water, replacing the water lost by evaporation, cool, filter the solution through glass wool, or asbestos and acidify to litmus paper with hydrochloric acid; no turbidity is produced.

Ceresin, paraffin and certain other waxes :

Boil 1 g for one hour under a reflux condenser with 10 ml of 0.5 N alcoholic potassium hydroxide and 10 ml of alcohol; detach the flask from the condenser, insert a thermometer and allow to cool, stirring constantly; the liquid is clear and homogenous above 61°, but becomes cloudy between 61° and 59° and precipitation of large flocks occurs at not more than 2°, below the temperature at which the liquid becomes cloudy.

Glycerin

Chemical Formula : $CH_2OH.\ CHOH.\ CH_2OH$ Mol. Wt. 92.1

Description : A clear, colourless, syrupy liquid; odourless; taste sweet followed by a sensation of warmth. Hygroscopic. It is miscible with water and alcohol; insoluble with solvent ether, with chloroform and with fixed oils. When kept for sometimes at a low temperature, it may solidify, forming a mass of colourless crystals which do not melt until the temperature reaches about 20°. Its specific gravity is 1.255 to 1.266 at 20°. It is commonly obtained by the hydrolysis of fats and fixed oils or by synthesis. It contains not less than 98.0 percent $C_3H_8O_3$.

Identification :
(a) When heated with potassium hydrogen sulphate gives off irritating vapours.

(b) When heated on a borax lead in a Bunsen flame, it gives a green flame.
(c) A 10.0 percent w/v solution is neutral to solution of litmus.
(d) Refractive Index : 1.471 to 1.473 at 20°.

Certain reducing substances : Mix 5 ml with 5 ml of dilute ammonia solution and heat at 60° for five minutes. Add rapidly 0.5 ml of silver nitrate solution, making the addition from a pipette, the nozzle of which is kept above the mouth of the tube and allowing the reagent to fall directly into the solution without touching the sides of the tube. Mix and allow to stand in the dark for five minutes; no darkening is produced.

Fatty acids and Esters : Mix 50 g with 100 ml of hot freshly boiled water, add 1 ml of phenolphthalein solution and neutralise if alkaline with 0.2 N sulphuric acid. Add 15 ml of 0.2 N sodium hydroxide, boil under a reflux condenser for five minutes, cool and titrate with 0.2 sulphuric acid. Repeat the operation omitting the glycerin and using 140 ml of water. The difference between the titration is not more than 1.6 ml.

Sucrose : To 4 ml add 6 ml of 1 N sulphuric acid, boil for one minute, cool and neutralise to litmus paper with sodium hydroxide solution. Add 5 ml of potassium cupritartrate solution and boil for one minute; no orange-brown colour or precipitate is produced.

Sulphated ash : Heat 50 g until it ignites and allow to burn. Cool the residue moisten with sulphuric acid and ignite, the residue weighs not more than 5 mg.

Storage : It should be kept in well-closed container.

Lanolin (anhydrous)

Synonmys : Adeps Lanae, Wool-fat.

Lanolin is the purified anhydrous fat-like substance obtained from the wool of the sheep. Ovis aries (Family : Bovidre). The natural grease is extracted from the wool by scouring with dilute alkali, with which it readily forms an emulsion; the emulsion is acidified and the woolfat separates as a distinct layer at the surface of the liquid. Purification may be effected by repeated treatment with water in a centrifuge.

Description : A pale yellow, tenacious, unctuous substance; odour, faint and characteristic. It is insoluble in water; sparingly soluble in cold alcohol; freely soluble in ether and in chloroform. It melts between 36° to 42°. Contains not more than 200 parts per million of butylated hydroxyanilose or butylated hydroxytoluene.

Identification :
(a) Dissolve 0.5 g in 5 ml of chloroform and add 1 ml of acetic anhydride and 2 drops of sulphuric acid; a deep green colour is produced.

(b) Acid Value : Not more than 1.

(c) Iodine Value : 18 to 32 (iodine monochloride method).

(d) Saponification Value : 92 to 106.

Storage : In well-closed container at a temperature not exceeding 30°.

Olive Oil

It is the fixed oil obtained by expression from the ripe fruits of Olea europaeal L. (Family : Oleaceae), it may be refined.

Description : A pale yellow, or greenish yellow oil; odour, slight, but not rancid; taste, characteristic. It may be a solid or partly solid at lower temperatures. It is almost insoluble in alcohol; miscible with solvent ether and chloroform. Its specific gravity is 0.910 to 0.913 at 20°. It contains 70 percent olein and the remainder is mostly palmitin.

Identification :

(a) Acid Value : Not more than 2.0.

(b) Iodine Value : 79 to 88 (iodine monochloride method) .

(c) Refractive Index : 1.468 to 1.471, at 20.

(d) Saponification Value : 190 to 195.

Arachis Oil : It complies with test for the absence arachis oil in other oils.

Cotton-seed Oil : It complies with the test for the absence of cotton-seed in other oils.

Sesame Oil : Shake with an equal volume of a mixture of 9 parts by volume of alcohol and 1 part by volume of strong ammonia solution and heat on a water-bath until free from alcohol and ammonia; the product responds to the test for the absence of sesame oil in other oils.

Storage : It should be kept in well-filled, well-closed container.

Paraffin Soft

It is a semi-solid mixture of hydrocarbons obtained from Petroleum. It is available in two varieties viz., white paraffin soft and yellow paraffin soft.

White Soft Paraffin

Synonyms : White Petroleum jelly; Paraffinum Molle Album.

Description : A white, translucent mass, unctous to touch; tasteless and odourless when rubbed on the skin. It is not more than slightly fluorescent by day light even when melted. It is almost insoluble in water and in alcohol; soluble in chloroform and solvent ether. Its specific gravity is 0.815 to 0.88 at 20°. It has a melting point of 38° to 56°. It is obtained by bleaching yellow soft paraffin.

Reaction : Boil 5 g with 10 ml of alcohol previously neutralised to litmus solution; the alcohol is neutral to litmus solution.

Foreign organic matter : Volatilses, when heated, without emitting an acrid odour.

Sulphated ash : Not more than 0.1 percent.

Fixed oil and fats : Digest 10 g with 50 ml of solution of sodium hydroxide at 100° for thirty minutes and allow the aqueous layer to separate. On acidifying aqueous layer with dilute sulphuric acid, no precipitate or oily matter is produced.

Yellow Soft Paraffin

Synonyms : Petroleum; paraffinum Molle Flavum.

It is a semi-solid mixture of hydrocarbons obtained from petroleum.

Description : A pale yellow or yellow, translucent, soft mass, unctuous to touch and retaining these characters on storage and when melted and allowed to cool without stirring, not more than slightly fluorescent by day light, even when melted; tasteless; odourless when rubbed on the skin. It is insoluble in water and an alcohol; soluble in chloroform and in solvent ether. Its specific gravity is 0.815 to 0.880.It melts between 38° to 56°. It is usually separated from certain crude residual fractions or heavy lubricating oil fractions by chilling and purified by hot filtration through fuller's earth or activated charcoal.

Reaction : It responds to the test described under white paraffin soft.

Foreign organic matter : Volatilises, when heated, without emitting an acrid odour.

Sulphated ash : Not more than 0.1 percent.

Fixed oils and fats : It responds to the test for 'fixed oils and fats' describe under while soft paraffin.

Paraffin Hard

Synonym : Paraffinum Durum.

It is a mixture of solid hydrocarbons consisting mainly of n-paraffins and, to a lesser extent, of their isomers.

Description : A colourless or white substance, frequently showing a crystalline structure; odourless, even when freshly cut; tasteless; slightly greasy to touch. It burns with a luminous flame. It is insoluble in water and in alcohol; soluble in solvent ether and chloroform. It may be obtained by distillation from Petroleum, the hard paraffin being separated from the appropriate fractions by pressing or processes, sweated or refined by clay or acid. It may also be obtained, in a similar manner from the oil produced in the destructive distillation of shale.

Reaction : Boil 5 g with 10 ml of alcohol (90 percent) previously neutralised to litmus solution; the alcohol is neutral to litmus solution.

Melting range : 50° to 57°.

Sulphated ash : Not more than 0.1 percent.

Spermaceti

Synonym : Cetaceum.

Description : A white, somewhat translucent, slightly unctuous masses with a crystalline fracture; faint odour and a bland, mild taste. It is insoluble in water and cold alcohol; soluble in boiling alcohol, ether and chloroform. Its specific gravity is 0.95 and melts between 42° and 50°. It contains not less than 48.0 percent unsaponifibale matter. It is solid wax obtained from the mixed oils, which are recovered from the head, blubber and carcase of the sperm whale, Physeter catodon and the bottle nosed whale. On standing a crystalline deposit forms in the oil. The deposit is separated by filtration, pressed, melted, purified from traces of oil with dilute

sodium hydroxide solution and finally freed from the soap thus produced and free from excess of alkali.

Identification :

(a) Acid Value : Not more than 1.0.

(b) Iodine Value : Not more than 5 (iodine monochloride method).

(c) Saponification Value : 120 to 136.

Glycerol : To 10.0 g add 40 ml of alcoholic potassium hydroxide solution and 60 ml of alcohol, boil under reflux condenser for 30 minutes, cool, add 90 ml of chloroform and 25 ml of glacial acetic acid, transfer to a 1000 ml volumetric flask and wash the flask and the condenser with three successive 125 ml portions of water; to the combined solution and washing add 500 ml of water; shake vigorously dilute to 1000 ml with water, mix and allow to separate, add 100 ml of the aqueous layer to 50 ml of 0.1 M periodic acid, allow to stand for 30 minutes, add 30 ml of potassium iodide solution, allow to stand for 1 minute and titrate with 0.1 N sodium thiosulphate, using starch mucilage, adding towards the end of the titration, as indicator. Repeat the procedure omitting the sample. The difference between the two titrations is not more than 5.0 ml.

Rosemary oil

Synonym : Oleum Rosmarini.

Description : A colourless or pale yellow liquid; odour characteristic of rosemary; taste, camphoraceous. It is slightly soluble in alcohol (90 percent). Its specific gravity is 0.894 to 0.912. It is obtained by distillation from flowering tops or leafy twigs of *Rosmarinus officinalis* L. (Family-Labiatae), an evergreen shrub indigenous to southern Europe.

Identification :

(a) Optical Rotation : From –5° to +10°. at 20°.

(b) Refractive Index : 1.466 to 1.476 at 20°.

Storage : It should be stored in well-filled air containers, in a cool place protected from light.

Sesame oil

Synonyms : Gingelly oil; til oil; Oleum Sesami; Benne Oil.

It is a fixed oil obtained by expression from the seeds of *Sesamum indicum* L, (Family : Pedaliaceae), a plant grown in India and most tropical countries.

Description : A pale yellow, oily liquid; odour, slight; taste, bland. It is slightly soluble with alcohol; miscible with ether and chloroform. Its specific gravity is 0.916 to 0.919 at 20°. It contains about 75.0 percent olein, together with other glycerides.

Identification :

(a) Acid Value : Not more than 2.0.

(b) Iodine Value : 103 to 116 (iodine monochloride method).

(c) Refractive Index : 1.472 to 1.476 at 20°.

(d) Saponification Value : 188 to 195.

Storage : It should be stored in well-filled air tight containers, in a cool place protected from light.

Prepared Lard

Description : A white, soft, unctuous mass, faint odour, taste, bland free from rancidity. It is insoluble in water but readily soluble in ether and chloroform. It melts between 36° and 42°, forming a clear liquid from which no water separates. It is the purified internal fat of abdomen of hog' and contains more olein than beef fat or mutton suet.

Caution : Protect it from conditions favouring rancidity.

Curd Soap

It is a soap separated by salt solution, reheated and mixed with sufficient water to form a smooth emulsion; run into frames, cooled and cut into bars or cakes. It usually constitutes the bar laundry soap. It is frequently high in alkali and usually contains fillers such as sodium silicate.

Storage : In well-closed containers.

Hard Soap

It is prepared from fats or oils, with sodium hydroxide and it consists of the sodium salts of the fatty acids.

Description : A white or whitish flakes or cakes or yellowish-white powder, odour and free from rancidity. It is slowly soluble in water and alcohol.

Storage : In well-closed containers.

Soft Soap

Synonym : Sapo Mollis.

Description : A soft yellowish-white to green or brown, unctuous; odour characteristic. It is soluble in water and in alcohol. It is a soap made by the interaction of either potassium hydroxide or sodium hydroxide with a suitable vegetable oil or oils; or with fatty acids derived therefrom. The soap, if prepared from oil contains the glycerin formed during saponification. It yields not less than 44.0 percent of fatty acids.

Assay : A weighed quantity of the soap (fatty acids, contents should not be less than 44.0 percent) is dissolved in water and solution acidified with dilute sulphuric acid. The liberated

fatty acids are extracted with ether and the extract is then washed until the washings are neural to litmus and then transferred to a weighed flask. The solvent is distilled from a water-bath and the residue of the fatty acids is dried to constant weight at 80°.

Starch

Synonym : Amylum.

Description : A fine white powder, or irregular angular masses readily reducible to powder; odourless; taste, slight characteristic. It is insoluble in cold water and in alcohol.

It consists of polysaccharide granules obtained from the grains of maize. *Zea mays* Linn. of rice, *Oryza sativa* Linn. or of wheat, *Triticum aestivum* Linn. (Fam : Gramineae), or from the tubers of the potato, *Solanum tuberosum* Linn.

Identification : Yields, when boiled with fifteen times of its weight of water and cooled, a translucent viscous fluid or jelly, which is coloured deep blue by iodine solution; the colour disappears on warming and reappears on cooling.

Acidity : Add 10 g to 100 ml of alcohol (70 percent) previously neutralised to phenolphthalein solution, shake well during one hour, filter and titrate 50 ml of the filtrate with 0.1 N sodium hydroxide, using phenolphthalein solution as indicator; not more than 2.0 ml of 0.1 N sodium hydroxide is required.

Iron : Mix 0.5 with 10 ml of water and add 0.5 ml of hydrochloric acid and 0.3 ml of potassium ferrocyanide solution; the mixture does not become blue within one minute.

Ash : Not more than 0.3 percent (maize starch) 0.6 percent (rice starch), 0.3 percent (potato starch) and 0.3 percent (wheat starch).

Loss on drying : When dried to constant weight at 105°, loses not more than 14.0 percent of its weight (maize starch, rice starch and wheat starch) or not more than 20.0 percent of its weight (potato starch).

Storage : It should be kept in well-closed container and stored in a cool dry place.

Labelling : The label should indicate the source of it.

APPENDIX—XV

DETERMINATION OF SAPONIFICATION, IODINE & ACID VALUES

(a) Determination of Saponification value

The saponification value is the number of mg of potassium hydroxide required to neutralize the fatty acids, resulting from the complete hydrolysis of 1 g of the oil or fat, when determined by the following method :

Dissolve 35 to 40 g of potassium hydroxide in 20 ml water and add sufficient alcohol to make 1,000 ml. Allow it to stand overnight and pour off the clear liquid.

Weigh accurately about 2 g of the substance in a tared 250 ml flask, add 25 ml of the alcoholic solution of potassium hydroxide, attach a reflux condenser and boil on a water-bath for one hour, frequently rotating the contents of the flask cool and add 1 ml of solution of phenolphthalein and titrate the excess of alkali with 0.5 N hydrochloric acid. Note the number of ml required (a). Repeat the experiment with the same quantities of the same reagents in the manner omitting the substance. Note the number of ml required (b). Calculate the saponification value from the following formula :

$$\text{Saponification Value} = \frac{(b-a) \times 0.02805 \times 1.000}{W}$$

Where 'W' is the weight in g of the substance taken.

(b) Determination of Iodine Value

The Iodine value of a substance is the weight of iodine absorbed by 100 part by weight of the substance, when determined by one of the following methods : -

Apparatus :

Iodine Flasks : The Iodine flasks have a nominal capacity of 250 ml.

Method :

Iodine Monochloride Method : Place the substance accurately weighed, in dry iodine flask, add 10 ml of carbon tetrachloride and dissolve. Add 20 ml of iodine monochloride solution, insert the stopper, previously moistened with solution of potassium iodine and allow to stand in a dark place at a temperature of about 17° or thirty minutes. Add 15 ml of solution of potassium iodine and 100 ml water; shake and titrate with 0.1 N sodium thiosulphate, using solution of starch as indicator. Note the number of ml required (a). At the same time carry out the operation in exactly the same manner, but without the substance being tested and note the number of ml of 0.1 N sodium thiosulphate required (b).

Calculate the iodine value from the formula :

$$\text{Iodine value} = \frac{(b-a) \times 0.01269 \times 100}{W}$$

Where 'W' is the weight in g of the substance taken.

The approximate weight, in g, of the substance to be taken may be calculated by dividing 20 by the highest expected iodine value. If more than half the available halogen is absorbed, the test must be repeated, a smaller quantity of the substance being used.

Reagent : —

Iodine Monochloride Solution : The solution may be prepared by either of the two following methods :

(1) Dissolve 13 g of iodine in a mixture of 300 ml of carbon tetrachloride and 700 ml of glacial acetic acid. To 20 ml of this solution, add 15 ml of solution of potassium iodide and 100 ml of water and titrate the solution with 0.1 N sodium thiosulphate. Pass chlorine, washed and dried, through the remainder of the iodine solution until the amount of 0.1 N sodium thiosulphate required for the titration is approximately, but not more than, doubled.

(2) Iodine Trichloride	8 g
Iodine	9 g
Carbon Tetrachloride	300 ml
Glacial Acetic Acid, sufficient to produce	1000 ml

Dissolve the iodine trichloride in about 200 ml of glacial acetic acid, dissolve the iodine in the carbon tetrachloride, mix the two solutions and add sufficient glacial acetic acid to produce 1000 ml.

Iodine Monochloride Solution should be kept in a stoppered bottle, protected from light and stored in a cool place.

Pyridine Bromide Method : Place the substance, accurately weighed, in a dry iodine flask, add 10 ml of carbon tetrachloride and dissolve. Add 25 ml of pyridine bromide solution, allow to stand for ten minutes in a dark place and complete the determination described under iodine monochloride method, beginning with the words 'Add 15 ml'.

The approximate weight in gram, of the substance to be taken may be calculated by dividing 12.5 by the highest expected iodine value. If more than half the available halogen is absorbed the test must be repeated, a small quantity of the substance being used.

Reagent : **—**

Pyridine Bromide Solution : Dissolve 8 g pyridine and 10 g of sulphuric acid in 20 ml of glacial acetic acid, keeping the mixture cool. Add 8 g of bromine dissolved in 20 ml of glacial acetic acid and dilute to 100 ml with glacial acetic acid.

Pyridine Bromide Solution should be freshly prepared.

(c) Determination of Acid Value :

The acid value is the number of mg potassium hydroxide required to neutralize the free acid in 1 g of the substance, when determined by the following method :

Weigh accurately about 10 g of the substance (1 to 5) in the case of a resin into a 250 ml flask and add 50 ml of a mixture of equal volumes of alcohol and solvent ether which has been neutralised after the addition of 1 ml of solution of phenolphthalein. Heat gently on a water-bath, if necessary until the substance has completely melted, titrate with 0.1 N potassium hydroxide, shaking constantly until a pink colour which persists for fifteen seconds is obtained. Note the number of ml required. Calculate the acid value from the following formula :

$$\text{Acid Value} = \frac{a \times 0.00561 \times 1.000}{W}$$

Where ‘a’ is the number of ml of 0.1 N potassium hydroxide required and ‘W’ is the weight in g of the substance taken.

APPENDIX—XVI

(A) TEST FOR THE ABSENCE OF ARCHIS OIL IN OTHER OILS

Boil 1 ml of the oil in a small flask under reflux condenser with 5 ml of 1.5 N alcoholic potassium hydroxide for ten minutes. Add 50 ml of alcohol (70 percent) and 0.8 ml of hydrochloric acid.

Cool with a thermometer in the liquid with continuous stirring so that the temperature falls by about 1° per minute. Note the temperature at which turbidity appears. No turbidity appears above 4° for Almond Oil, above 11° for Maize Oil or above 9° for Olive Oil.

If turbidity is formed above the specified temperature, carry out the following test : —

Boil 5 g of the oil in a 200 ml conical flask with 25 ml of 1.5 N alcoholic potassium hydroxide for ten minutes under a reflux condenser. To the hot solution add 7.5 ml of acetic acid and 100 ml of alcohol (70 percent) containing 1 ml of hydrochloric acid. Maintain the temperature for an hour at 12° to 14°. Filter and wash with the same mixture of alcohol (70 percent) and hydrochloric acid at 17° to 19°, the precipitate being broken up occasionally by means of a platinum wire bent into a loop. The washing is continued, until the washings give no turbidity with water. Dissolve the precipitate according to its bulk in 27 to 70 ml of hot alcohol (90 percent), cool and allow it to stand at 15° for three hours. If no crystals appear, arachis oil is absent. If any crystals appear, filter and wash at 15° with about half the volume of alcohol (90 percent), used for crystallization and finally with 50 ml of alcohol (70 percent). Dissolve the crystals in warm solvent ether and dry at 105°. The melting point is lower than 71°. Recrystallise from a small quantity of alcohol (90 percent); the melting point, after drying at 105° remains lower than 71°.

(B) TEST FOR THE ABSENCE OF COTTON-SEED OIL IN OTHER OILS

Mix in a stout glass tube, having a capacity of not less than 15 ml, 2.5 ml of the oil with 2.5 ml of a mixture of equal volumes of amyl alcohol and carbon disulphide, the latter containing 1 percent w/v of precipitated sulphur in solution. Close the tube securely and immerse into one-third of its depth in boiling water; no pink or red colour develops in half an hour.

(C) TEST FOR THE ABSENCE OF SESAME-OIL IN OTHER OILS

Shake 2ml of the oil with 1 ml of hydrochloric acid, containing 1 percent w/v of sucrose and set aside for five minutes; the acid layer is not coloured pink or, if a pink colour appears, it is not deeper than that obtained by repeating the test with the same quantities of the reagent in the same manner omitting sucrose.

(D) TEST FOR THE ABSENCE OF LINSEED OIL IN OTHER OIL

To 1 ml of the oil in a dry test tube, add 5 ml of chloroform. Add bromine dropwise until the mixture becomes deep red in colour (about 1 ml of bromine is usually required) and cool the test-tube a little in iced water. Add alcohol (90 percent) dropwise while shaking the mixture until the precipitate which first forms just dissolves (when the amount of linseed oil present is large, precipitate does not dissolve completely); in general 1.3 to 1.5 ml of alcohol (90 percent)

is usually required. Then, add 10 ml of sulphuric acid, mix and place the tube in iced water for half-an-hour. Pure mustard oil remains absolutely clear, whereas the presence of even traces of linseed oil gives almost instant turbidity and a flocculent precipitate forms in about half-an-hour which settles at the bottom.

APPENDIX—XVII

HAHNEMANN'S CLASSIFICATION OF METHODS OF PREPARATION OF HOMOEOPATHIC DRUGS (OLD METHOD)

CLASS I

TINCTURES

Tinctures prepared with equal parts by weight of juice and alcohol.

The fundamental rule for this class is continued in Hahnemann's Mat. Med. Pura, under Belladonna.

The freshly-gathered plant or part thereof, chopped and pounded to a pulp is enclosed in a piece of new linen and subjected to pressure. The expressed juice is then, by brisk agitation, mingled with an equal part by weight of alcohol. This mixture is allowed to stand for eight days in a well-stoppered bottle, in a dark cool place and is then filtered.

Amount of drug power of tincture, ½.

POTENTISATION

A. Centesimal Scale
2 minims of tincture and 98 minims of dilute alcohol give the 1st potency.
1 minim of the 1st potency and 00 minims of alcohol give the 2nd potency.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

B. Decimal Scale
2 minims of tincture and 8 minims of dilute alcohol give the 1x potency.
1 minim of the 1x potency and 9 minims of the dilute alcohol give the 2x potency.
1 minim of the 2x potency and 9 minims of dilute alcohol give the 3x potency.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS II

TINCTURES
Tinctures expressed by the aid of two parts of alcohol added to three parts of plant or part thereof.

The fundamental rule for this class is contained in Hahnemann's Mat. Med. Pura, under Thuja.

The finely chopped, fresh plant or part thereof, is weighed. To every three parts, two parts by weight of alcohol are taken. Then the chopped plant is moistened with as much alcohol as is necessary to bring the mass to a thick pulp and is well stirred. Adding the rest of the alcohol, the

whole is mixed together and strained through a piece of new linen. The tincture thus obtained is allowed to stand eight days in a well-stoppered bottle, in a dark, cool place and then filtered.

Amount of drug power of tincture, ½.

POTENTISATION

a. Centesimal Scale
2 minims of tincture and 98 minims of dilute alcohol give the 1st potency.
1 minim of the 1st potency and 99 minims of alcohol give the 2nd potency.

All the following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale
2 minims of tincture and 8 minim soft dilute alcohol give the 1x potency.
1 minim of the 1x potency and 9 minims of dilute alcohol give the 2x potency.
1 minim of the 2x potency and 9 minims of alcohol give 3x potency.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS III

TINCTURES

Tinctures prepared with two parts by weight of alcohol to one part of plant or part thereof.

The fundamental rule for this class is contained in Hahnemann's Mat. Med. Pura, under Scilla.

The fresh plant or part thereof, is pounded to a fine pulp and weighed. The two parts by weight of alcohol are taken and after thoroughly mixing the pulp with one-sixth part of it, the rest of the alcohol is added. After having stirred the whole and having filled it into a well-stoppered bottle, it is allowed to stand eight days, in a dark, cool place. The tincture is then separated by decanting, straining and filtering.

Amount of drug power of tincture, 1/6.

POTENTISATION

a. Centesimal Scale
6 minims of tincture and 94 minims of dilute alcohol give the 1st potency.
1 minim of the 1st potency and 99 minims of alcohol give the 2nd potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

b. Decimal Scale
6 minims of tincture and 4 minims of dilute alcohol give the 1x potency.
1 minim of the 1x potency and 9 minims of dilute alcohol give the 2x potency.
1 minim of the 2x potency and 9 minims of alcohol give 3x potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS IV

TINCTURES

Tincture prepared with five parts by weight of alcohol.

The fundamental rule for this class is continued in Hahnemann's Mat. Med. Pura, under Spigelia and Staphisagria.

Weigh the finely divided substance (dried vegetable and animal substances are pulverized, fresh animal substances are pounded) and pour over it five parts by weight of alcohol, then let the mixture remain eight days (provided that for the particular medicine a longer maceration is not required), at ordinary temperature in a dark place, shaking it, twice a day; then pour off, strain and filter.

Amount of drug power of tincture, 1/10.

POTENTISATION

a. Centesimal Scale
10 minims of tincture and 90 minims of alcohol give the 1st potency.
1 minim of the 1st potency and 99 minims of alcohol give the 2nd potency.

All the following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale
As the tincture contains 1/10 drug power, it corresponds to the 1x potency.
1 minim of tincture and 9 minims of alcohol give the 2x potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS V-A

Aqueous Solution

One part by weight of the medicinal substance is dissolved in nine parts by weight of purified water.

Amount of drug power of solution, 1/10.

Potentisation

a. Centesimal Scale
10 minims of the solution and 90 minims of purified water give the 1st potency.
1 minim of the 1st potency and 99 minims of alcohol give the 2nd potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

As the solution contains 1/10 drug power, it corresponds to the 1x potency.
1 minim of the solution and 9 minims of purified water give the 2x potency.
1 minim of the 2x potency and 9 minims of dilute alcohol give the 3x potency.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS V-B

Aqueous Solutions

One part by weight of the medicinal substance is dissolved in ninety-nine parts by weight of purified water.

Amount of drug power of solution, 1/100.

Potentisation

a. Centesimal Scale

As the solution contains 1/100 drug power, it corresponds to the 1st potency.
1 minim of the solution and 99 minims of the dilute alcohol give the 2nd potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

As the solution contains 1/100 drug power, it corresponds to the 2x potency.
1 minim of the solution and 9 minims of dilute alcohol give the 3x potency.
1 minim of the 3x potency and 9 minims of dilute alcohol give the 4x potency.

All following potencies are prepared with one minim of the preceding potency to nine minutes of alcohol.

CLASS VI-A

Alcoholic Solutions

One part by weight of the medicinal substance is dissolved in nine parts by weight of alcohol.

Amount of drug power of solution, 1/10.

Potentisation

a. Centesimal Scale

10 minims of the solution and 90 minims of alcohol give the 1st potency.

1 minim of the 1st potency and 99 minims of alcohol give the 2nd potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

As the solution contains 1/10 drug power, it corresponds to the 1x potency.
1 minim of the solution and 9 minims of alcohol give the 2x potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS VI-B

Alcoholic Solutions

One part by weight of the medicinal substance is dissolved in ninety-nine parts by weight of alcohol.

Amount of drug power of solution, 1/100.

Potentisation

a. Centesimal Scale

As the solution contains 1/100 drug power, it corresponds to the 1x potency.
1 minim of the solution and 99 minims of alcohol give the 2nd potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

As the solution contains 1/100 drug power, it corresponds to the 2x potency.
1 minim of the solution and 9 minims of alcohol give the 3x potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS VII

Trituration of Dry Medicinal Substances

The fundamental rule for this class is contained in Hahnemann's Mat. Med. Pura, under Arsenicum.

For the trituration and potentisation of dry medicinal substances the following proportions of weight and measure form the basis:

a. Centesimal Scale

One part by weight of the medicinal substance to 99 parts by weight of sugar of milk gives the 1st trituration.

All following triturations and potentisation are prepared with one grain of the preceding trituration to ninety-nine grains of sugar of milk.

Conversion into Liquid Potencies

One grain of the 3c trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol gives the 4th potency.

1 minim of the 4th potency to 99 minims of alcohol gives the 5th potency.

All the following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

One part by weight of the medicinal substance to 9 parts by weight of sugar of milk gives the 1x trituration.

All following triturations are prepared with one grain of the preceding trituration to nine grains of sugar of milk.

Conversion into Liquid Potencies

One grain of the 6th trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol, gives the 8x potency.

1 minim of the 8x potency to 9 minims of dilute alcohol gives the 9x potency.

1 minim of the 9x potency to 9 minims of alcohol gives the 10x potency.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

CLASS VIII

Trituration of Liquid Substances

The rule for this class is contained in Hahnemann’s Chronic Diseases, under Petroleum.

For the trituration of these substances the following proportions of weight and measure form the basis.

a. Centesimal Scale

1 minim of the substance to 99 grains of sugar of milk gives the 1st trituration.

1 part by weight of the 1st trituration to 99 parts by weight of sugar of milk gives the 2nd trituration.

All following triturations are prepared with one grain of the preceding trituration to ninety-nine grains of sugar of milk.

Conversion into Liquid Potencies

One grain of the 3c trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol, give the 4th potency.

1 minim of the 4th potency to 99 minims of alcohol gives the 5th potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

b. Decimal Scale

1 minim of the substance to 9 grains of sugar of milk gives the 1x trituration.

1 part by weight of the 1x trituration to 9 parts by weight of sugar of milk gives the 2x trituration.

All the following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

Conversion into Liquid Potencies

One grain of the 6x trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol, give the 8x potency.

1 minim of the 8x potency to 9 minims of dilute alcohol gives the 9x potency.

1 minim of the 9x potency to 9 minims of alcohol gives the 10x potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

CLASS IX

Trituration of fresh vegetable and Animal Substances

For this class, the lower triturations of which cannot be preserved, the rule is found in Hahnemann’s Chronic Diseases, under Agaricus.

Fresh vegetables and animals are first pounded or grated to a fine pulp, then triturated and potentised according to the following proportions by weight and measure : -

a. Centesimal Scale

Two parts * by weight of the substances and 99 parts by weight of sugar of milk gives the 1st trituration.

One part by weight of the first trituration to 99 parts by weight of sugar of milk gives the 2c trituration.

All following triturations are prepared with one part by weight of the preceding trituration to ninety-nine parts by weight of sugar of milk.

Conversion into Liquid Potencies

One grain of the 3c trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol gives the 4th potency.

1 minim of the 4th potency to 99 minims of alcohol gives the 5th potency.

All following potencies are prepared with one minim of the preceding potency to ninety-nine minims of alcohol.

a. Decimal Scale

Two parts * by weight of the substance and 9 parts by weight of sugar of milk give the 1x trituration.

1 part by weight of the 1x trituration to 9 parts by weight of sugar of milk gives the 2x trituration.

All following trituration are prepared with one part by weight of the preceding trituration to nine parts by weight of sugar of milk.

Conversion into Liquid Potencies

One grain of the 6x trituration dissolved in 50 minims of purified water and mixed with 50 minims of alcohol gives the 8x potency.

1 minim of the 8x potency to 9 minims of dilute alcohol gives the 9x potency.

1 minim of the 9x potency to 9 minims of alcohol gives the 10x potency.

All following potencies are prepared with one minim of the preceding potency to nine minims of alcohol.

* Two parts are taken because of loss by evaporation during trituration.

APPENDIX—XVIII

NAMES, SYMBOLS AND ATOMIC WEIGHTS OF ELEMENTS

^{12}C-12

Element	Symbol	Atomic Weight
1	2	3
Aluminium	Al	26.9815
Antimony	Sb	121.75
Arsenic	As	74.9216
Barium	Ba	137.34
Bismuth	Bi	208.980
Boron	B	10.811
Bromine	Br	79.909
Cadmium	Cd	112.40
Calcium	Ca	40.08
Carbon	C	12.01115
Cerium	Ce	140.12
Chlorine	Cl	35.453
Chromium	Cr	51.996
Cobalt	Co	58.9332
Copper	Cu	63.546
Flourine	F	18.9984
Gold	Au	196.967
Helium	He	4.0026
Hydrogen	H	1.00797
Iodine	I	126.9044
Iron	Fe	55.847
Lanthanum	La	138.91
Lead	Pb	207.19
Lithium	Li	6.939
Magnesium	Mg	24.305
Manganese	Mn	54.9380
Mercury	Hg	200.59
Molybdenum	Mo	95.94
Nitrogen	N	14.0067
Oxygen	O	15.9994
Phosphorus	P	30.9738
Platinum	Pt	195.09
Potassium	K	39.102
Ruthenium	Ru	101.07
Selenium	Se	78.96
Silicon	Si	28.086
Silver	Ag	107.870
Sodium	Na	22.9898
Sulphur	S	32.064
Tin	Sn	118.69
Titanium	Ti	47.90

Tungsten	W	183.85
Uranium	U	283.03
Vanadium	V	50.942
Zinc	Zn	65.37
Zirconium	Zr	91.22

APPENDIX—XIX

NAMES IN INDIAN LANGUAGES OF INDIGENOUS DRUGS

ABROMA AUGUSTA

Assam : Gunakhiakarai; Bengali : Ulatkambal; Gujarati : Olat Kambal Hindi : Olat Kambal; Oriya : Pisacho : gonjai; Tamil : Sivapputtutti.

ACALYPHA INDICA

Bengali : Mukta-Jhuri; Bombay & Hindi : Khokali, kuppi; Gujarati : Vanchhi Kanto; Malayalam, Tamil & Telugu : Kuppamani; Oriya : Indramaris; Sanskrit : Arittamunjari.

ACONITUM NAPELLUS

Bengali : Kathbish Mithabis; Hindi : Mitbazahar; Sanskrit : Bisha.

ALLIUM CEPA

Hindi : Piyaz, Punjabi : Ganda, Wassal; Sanskrit : Palandu; Bengali : Payaj; Telugu : Nirulli; Tamil : Vangayam, Ilulli.

ALLIUM SATIVUM

Hindi : Lasan, Lasun; Assam : Naharu; Bengali : Rasun; Gujarati & Marathi : Lasun; Tamil : Vallaippundu; Telugu-Vellullitellagada; Urdu : Lehsun.

ALOE SUCCOTRINA

Araboc : Musabar; Bengali, Malayalam & Sanskrit : Ghritkumar; Gujarati : Kudvikunvar; Hindi : Ghikumari, Ghikavar; Marathi : Kunvarpata; Tamil : Kattalai; Telugu : Manjikattali; Urdu : Ghiqwara.

ANACARDIUM ORIENTALE

Hindi : Vilaba, Bhilawa; Bengali : Vela; Sanskrit : Bhallika; Malayalam : Temprakku; Tamil : Serangottai; Telugu : Bhallatamu.

ANDROGRAPHIS PANICULATA

Bengali : Kalmegh; Gujarati : Kariyatu; Hindi : Kiryat, Kirata; Malayalam : Kiryat Nelavepu; Marathi : Olikirayat; Sanskrit : Bhunimba Kirat; Tamil : Nilavembu, Shirat Kuchi; Telugu : Nelavemu.

ARTEMISAL VULGARIS

Bengali & Bombay : Nagadona; Hindi : Nagadouna; Punjabi : Tarkha; Sanskrit : Nagadamani; Tamil : Mashibattiri, Mchipatri; Telugu : Machipatri.

ASAFOETIDA

Hindi : Hing; Bombay : Hingra; Sanskrit : Hingu.

AZADIRACHATA INDICA

Bengali & Hindi : Nim; Bombay : Balnimb, Nim; Gujarati : Limbado; Marathi : Nimbay; Oriya : Nimo; Sanskrit -Nimba; Tamil : Veppu; Telugu : Nimbamu.

BOERHAAVIA DIFFICA

Bengali : Punranba; Gujarati : Moto satodo; Hindi : Sant, Punarnava; Marathi : Vasu; Sanskrit : Shothaghai, Punarnava; Tamil : Mukkarattai; Telugu : Atika mamidi.

CALOTROPIS GIGANTEA

Bengali : Akanada; Bombay : Ak; Gujarati : Akado, Akro; Hindi : Ak, Mudar Mudhar; Marathi : Akanada; Oriya : Orko; Sanskrit : Arka; Tamil : Vellarukku; Telugu : Mandaramu.

CANNABIS SATIVA

Bengali : Bhang, Ganja; Gujrati, Tamil & Telugu : Ganja; Hindi : Bhung, Gharas, Ganja; Marathi : Bhang; Sanskrit : Bhanga, Ganjika.

COCCULUS INDICUS

Bengali & Hindi : Kakmari; Bombay : Kakphal; Gujarati : Kakaphola; Sanskrit : Kakmari; Tamil : Kaka-Koliviari Telugu : Kakamari.

COLCHICUM AUTUMNALE

Hindi : Hirantutiya, Suringam; Punjabi : Surinjin-talkh; Sanskrit : Hiranya utha; Urdu : Suranjane talkh.

COLOCYNTHIS

Bengali : Indrayan, Makhal; Bombay : Indrayan; Punjabi : Tumbi, Ghurumba; Sanskrit : Mahendravaruni; Tamil : Payk-kumutti, Veritummatti; Telugu : Etipuchchha.

CROTON TIGLIUM

Bengali : Jaypal; Bombay & Hindi : Jamalgota; Malayalam & Tamil : Nirvalam; Sanskrit : Jayapala; Telugu : Nepala.

FICUS RELIGIOSA

Bengali : Ashwattha; Gujarati : Jeri; Hindi : Pipal; Malayalam : Areyal; Sanskrit : Pippala; Tamil : Arshemaran.

GYMNEMA SYLVESTRIS

Bengali & Hindi : Merasingi, Chhita : Dudhilata; Bombay : Kavali; Sanskrit : Meshashringi; Tamil : Shiru Kuranja.

HOLARRHENA ANTIDYSENTERICA

Assam : Dudcory, Durkhuri; Bengali : Kurchi; Bombay : Kalakura; Gujarati : Dhowda, Kuda; Hindi : Kurchi, Kura; Malayalam : Kodagapala, Venpala, Oriya : Kherwa; Sanskrit : Kutaja; Tamil : Indrabam, Kodagapala; Telugu : Palakodsa.

HYDROCOTYLE ASIATICA

Assam : Manimuni; Bengali : Brahamamanduku, Tholkuri; Bombay : Karinga; Deccan : Vallari; Gujarati : Barmi; Sanskrit : Bramananduki; Hindi & Marathi : Mandupparni; Tamil : Vallerai; Telugu : Bokkudu; Urdu : Brahmi.

HYOSCYAMUS NIGER

Bengali : Khorasani ajayan; Gujarati : Khorasani ajmo; Hindi & Urdu : Khurasani ajvayan; Marathi : Khorasaniova; Sanskrit : Parasikaya; Tamil : Kurasaniyoman; Telugu- Kurashnivamam.

HYPERICUM PERFORATUM

Hindi : Bassant; Urdu : Balsana.

JONASIA ASHOKA

Bengali : Asok; Gujrati : Ashopalaya; Hindi : Ashok; Malayalam : Asoka; Marathi : Ashoka; Oriya : Osoko; Tamil : Asogam.

JUSTICIA ADHATODA

Bengali-Bokas, Vasaka; Gujarati : Ardhsi; Hindi : Adulasa, Vasaka; Marathi : Baksa; Oriya : Basongo; Punjabi : Bhaikar; Sanskrit : Vasaka; Tamil : Adhatodai; Urdu : Arusa.

LYCOPODIUM CLAVATUM

Hindi : Bendarli; Nepalese : Nagbeli; Punjabi : Walayati - bagan

NUX MOSCHATA

Bengali : Jayphal; Bombay, Punjabi & Hindi : Jaiphal; Gujarati : Jayephal; Sanskrit : Jaiphala, Jatiphala; Tamil : Jadikkai; Telugu : Jaji kava.

NUX VOMICA

Bengali : Kuchila; Bombay : Kajra; Gujarati & Hindi : Kuchla; Malayalam : Kanniram; Punjabi : Kuchrla; Sanskrit : Kachchira; Tamil : Ettikkotai, Kanjiram; Telugu : Mushti; Urdu : Kuchala.

OCIMUM SANCTUM

Hindi : Tulasi; Bengali : Tulasi; Bombay, Telugu, Tamil & Marathi : Tulasi, Sanskrit : Vishnu-priya, Tulsi, Divya, Bharati; Malayalam : Shiva-Tulsi.

PSORALEA CORYLIFOLIA

Bengali : Lata Kasturi, Bavachi; Bombay : Bawachi; Hindi : Bakuch; Sanskrit : Vakuchi; Tamil : Karpo-Karishi; Telugu : Karn-bogi.

RAUVOLFA SERPENTINA

Bengali & Bombay : Chandra; Hindi- Chotachand Sarpgandha; Malayalam : Chuvaunayllpuri; Oriya : Dhannerna, Dhanbarua; Sanskrit : Sarpgandha, Chandrika; Tamil : Covannamilpori; Telugu : Patala-agandhi.

RUTA GRAVELOENS

Bengali : Crmul; Bombay : Satap; Hindi : Sadab, Punjabi : Sudab; Sanskrit : Somalata; Tamil : Arvada; Telugu : Aruda.

SYZYGLUM JAMBOLANUM

Assam : Jamu; Bengali : Jam, Kalajam; Bombay : Jambhul Jambu; Gujarati : Jambu; Hindii : Jaman, Jamun; Sanskrit : Jambu, Jamula; Tamil : Nagai, Sambal; Telugu : Jambuvu.

TABACUM

Bengali : Tamak; Bombay & Hindi : Tambaku; Punjabi : Tamaku; Malayalam : Pokala; Sanskrit : Tamakhu; Tamil : Pugalyilay; Telugu : Pogaku.

TERMINALLA ARJUNA

Assam : Orjun; Bengali, Bombay & Hindi : Arjuna; Gujarati : Arjunasadra; Malayalam : Marutu; Oriya : Orjuno; Sanskrit : Arjuna; Tamil : Maruda; Telugu : Tellamaddi.

TRIBULUS TERRESTRIS

Bengali : Gokhru, Gokshura; Gujrati : Gokharu; Hindi : Chota-gokhru; Kanarese : Negalu; Malayalam : Neringil; Sanskrit : Gokshura; Tamil : Nerunji.

WITHANIA SOMNIFERA

Bengali : Ashvagandha; Bombay : Asgund Asvagandha; Gujarati : Asan; Hindi : Ashvagandha; Sanskrit : Ashvagandha; Tamil : Aswagandi; Telugu : Asvagandhi.

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Sheeles Green
Sieves
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Water-Carbon Dioxide Free
Water Hemlock
Wax Myrtle

Wild Indigo
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Wind Flower
Witch Hazel
Withania Somnifera
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Wormseed

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American arbor-vitae
American night-shade
American white hellebore
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Arittamunjari (S)
Arjuna (H & S)
Arjunasadra (Guj)
Arka (S)
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Asogam (Tam)
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Bitter-sweet
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Black hellebore
Black henbane
Black Snake root
Blessed thistle
Blood root
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Brahamamanduki (Beng & S)
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C

Calendine
Celtic nard
Cevadill seeds
Chandra (Beng & Bom)
Chandrika (S)
Chaste tree
China root

Chhita dudhilata (Beng & H)
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Cockroach
Coffee
Colic root
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Ermul (Ben)
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F

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Fool’s Parsley
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G

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Ganja (Guj, Tam, Tel & Ben)
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Garden Hemlock

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Honey bee
Horse-chestnut

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Indian Nettle
Indian sage
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L

Larkspur palmated
Lasan (H)
Lasun (H, Guj, Mar)
Latakasturi (Ben)
Leather charcoal
Leopard’s bane
Limbadu (Guj)
Louse sheeds

M

Machipatri (Tel)
Madhu Makhi (H)
Mahendravaruni (S & H)
Makhal (Beng)
Mandaramu (Tel)
Mandukparni (H)
Manimuni (As)
Manji-kattali (Tel)
Marking nut
Marsh cistus
Maruda (Tam)
Marutu (Mal)
Mashibattiri (Tam)
May apple
Meadow saffron

Merasingi (Beng & H)
Mesha-shringi (H)
Mezereon
Mithazaher (H)
Mithabis (Beng)
Mocha (H)
Moto satodo (Guj)
Mountain tobacco
Mudar (H)
Mudhar (H)
Mugwort
Muhti (H)
Mukkarattai (Tam)
Mukta Jhuri (Beng)
Mundukparni (H)
Musabar (Arab)
Mushti (Tel)

N

Nagadamani (S)
Nagadouna (H)
Nagai (Tam)
Nagbeli (Nep)
Naharu (Ass)
Narrow leaved cone flower
Negalu (Kan)
Nelavemu (Tel)
Nelavepu (Mal)
Nepala (Tel)
Neringil (Mal)
Nerunji (Tam)
Night blooming-cercus
Nilavembu (Tam)
Nim (H, Ben, Bom)
Nimba (S)
Nimbamu (Tel)
Nimbay (Mar)
Nirvalam (Mal & Tam)
Nirulli (Tel)
Nut meg

O

Oak
Oat
Octopus
Olat Kambal (H & Guj)
Olikirayat
Onion
Orjun (As)
Orjuno (Or)
Orko (Or)
Osoko (Or)

P

Palakodsa (Tel)
Palandu (S)
Parsikaya (S)
Patala-agandhi (Tel)
Payk-kumutti (Tum)
Pennywort
Peruvian bark
Phindak
Pingyat
Pipal (H)
Pippala (S)
Pipperidge bush
Pisacho-gonjai (Or)
Piyaz (H)
Podapatri (H)
Poison ash
Poison Hemlock
Poison ivy
Poison Nut
Pogaku (Tel)
Pokala (Mal)
Poppy
Pu (H)
Pugaiyilly (Tam)
Punarnava (H & S)
Purnanaba (Beng)
Parging Nat

R

Rasun (Beng)

Rattle snake milk wort
Ringo
Roundedleaved sundew

S

Sadab (H)
Sag angur (H)
Sambal (Tam)
Sant (H)
Sarpagandha (H & S)
Satap (Bom)
Savin
Serangottai (Tam)
Shirat kuchi (Tam)
Shiru kuranja (Tam)
Shiva Tulsi (Mal)
Shothaghai (S)
Sivapputtutri (Tam)
Somalata (S)
Spanish fly
Spikenard
Spotted alder
St. Ignatius' bean
Striped alder
Sudab (Pun)
Sundew
Surukuke
Suranjane talakh (U & Pun)
Sweating plant

T

Tail-chatta (H)
Tamak (Beng)
Tamakhu (S)
Tamaku (Pun)
Tambaku (H & Or)
Tarkha (Pun)
Tellanaddi (Tel)
Temprakhu (M)
Tholkuri (Beng)
Toad
Tobacco

Tulasi (H, Beng, Bom, Mar, Tam, Tel)
Tulsi (S)

U

Ulatkambal (Beng)

V

Vallaippundu (Tam)
Vallari (Dec. & Tam)
Vanchi kanto (Guj)
Vasaka (H, Beng, & S)
Vasu (Mar)
Vegetable charcoal
Vela (Beng)
Vellulli tellaegada (Tel)
Vellarukku (Tam)
Vengayam (Tam)
Venpala (Mal)
Veppu (Tam)
Vilaba (H)
Veritummatti (Tam)
Vishnu priya (S)

W

Walayati bagan (Pan)
Warted puffball
Wassal (Pun)
Water Hemlock
Wax myrtle
White hellebore
Wild croanes bill
Wild indigo
Wild rosemary
Wind flower
Wood charcoal

Z

Zerzul (H)

ABBREVIATIONS USED

1. As	Asamese	2. Ben or Beng	Bengali
3. Bom	Bombay	4. Guj	Gujarati
5. H	Hindi	6. M or Mar	Marathi
7. Mal	Malayalam	8. Nep	Nepali
9. Or	Oriya	10. Pun	Punjab
11. S	Sanskrit	12. Tam	Tamil
13. Tel	Telgu	14. U	Urdu

HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H.P.I.)

VOLUME – II

FIRST EDITION

1974



GOVERNMENT OF INDIA
MINISTRY OF HEALTH

F O R E W O R D

The Government of India was pleased to re-constitute the Homoeopathic Pharmacopoeia Committee vide their letter No. F.I-3/71-HPI, dated the 22nd December, 1971 for a period of three years. The functions of the Committee were enlarge to prepare the Indian Homoeopathic Pharmaceutical Codex in order to give detailed information on drugs and other pharmaceutical substances and to provide standards for a range of substances and materials that are not included in the Homoeopathic Pharmacopoeia of India and also to supplement the information included in the Homoeopathic Pharmacopoeia of India.

So far the reconstituted Committee held six meetings. After these deliberations, the Committee finalised the Second Volume of the Homoeopathic Pharmacopoeia of India, which consists of :

(i) General Notices
(ii) Preface
(iii) Introduction
(iv) Monographs (100)
(v) Appendices

The second volume of the Homoeopathic Pharmacopoeia of India is presented herewith to the Government of India.

DR. D. P. RASTOGI,
Secretary
Homoeopathic Pharmacopoeia Committee.

NEW DELHI :
The 20th December, 1974.

DR. JUGAL KISHORE,
Chairman
Homoeopathic Pharmacopoeia Committee.

NEW DELHI :
The 20th December, 1974

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GENERAL NOTICES

The General Notices, General Instructions and Appendices of First Volume of the H.P.I. subject to the following amendments are applicable to the material of both the 1st and 2nd Volumes of the H.P.I.

The following amendments are made in the General Notices and General Instructions given in the 1st Volume of H.P.I.

1. Synonyms : While the main title of the drug or its abbreviation alone should be used as the descriptive name on the label or in prescribing, the alternate names in Hindi, as well as names in English, French and German under which the drug is known commonly are given for information and these names could not be considered to have the same significance as the main title. The title Synonym has been retained only in cases where it is a true Synonym and in all other cases, it has been replaced by Common Names.

2. Label : In addition to the labeling and packing requirements mentioned under individual monographs of Pharmacopoeia, substances must comply with the abbreviation relating to labeling and packing as prescribed by the rules made under the Drugs and Cosmetic Act, 1940. The state of the plant — fresh or dry used should be mentioned on the label of the Tincture.

3. Appendix XII relating to the old method of preparation is deleted. Consequently, reference to the old method of preparation wherever occurring shall also stand deleted.

General Instructions

Unit of Medicinal Strength : The Unit of Medicinal Strength shall be that specified in the monograph for that drug. The Unit of Medicinal Strength in respect of old method shall stand deleted.

2. Following is substituted for paragraph 1 under Mother Tincture :

A. Maceration

(a) **Maceration** (the H.P.I. Vol. I) Maceration process shall be used in cases of fresh plant only.

PREFACE

The Government of India constituted the Homoeopathic Pharmacopoeia Committee in 1962 for the purpose of preparing the Homoeopathic Pharmacopoeia of India with a view to provides standards for the commonly used Homoeopathic medicines. This Committee did the preliminary work in preparing a comprehensive list of possible homoeopathic medicines and drafted the general notices and general instructions for the pharmacopoeia. It also prepared 180 monographs comprising the first volume which has since been published.

The Government of India in their letter No. F. 1-3-HPC dated the 22nd December, 1971 reconstituted the Homoeopathic Pharmacopoeia Committee with the following member :

1. Hony. Adviser in Homoeopathy, Government of India, Dr. Jugal Kishore, B.Sc., D.M.S. (Cal.). *Chairman*

2. Drugs Controller (India), Shri P. S. Ramachandran, M. Sc. *Member*

3. Director, Central Drugs Laboratory, Dr. D. Ghose, M.Sc., Ph.D. (WIS) F.R.I. (Lond.). *Member*

4. Dr. J. N. Kanjilal, M.B., D.M.S., Calcutta *Member*

5. Dr. P. N. Varma, B.Sc., M.Sc. (Tech. Pharma), Patna (Bihar) *Member*

6. Dr. P. Pandey, M.H.M.S., Meerut (U.P.) *Member*

7. Dr. P. N. Mehra, D.Sc., F.N.I., F.N.A.Sc., Head of the Department of Botany, Punjab University, Chandigarh *Member*

8. Dr. K. Prahlad, L.C.P.S. (Bombay) D.O (Madras) Bombay *Member*

9. Dr. H. L. Chitkara, B.A. (Hons.) D.H.S. New Delhi *Member*

10. Dr. R. K. Bandari, Delhi *Member*

11. Shri G. S. Bhar, B.A. Calcutta *Member*

12. Dr. S. Rangaswamy, M.A. Ph.D., D. Phil. F.R.I.C., Prof. of Organic Chemistry, University of Delhi, Delhi *Member*
(Since March, 1974)

13. Dr. L. N. Maahapatra, MBBS., M.D., D.B. (Lond.) Prof. and Head of Deptt. of microbiology, All India Institute of Medical Sciences, New Delhi *Member* (Since March, 1974)

14. Asstt. Adviser in Homoeopathy, Government of India, Dr. D. P. Rastogi, M.A., D.M.S. Hons. D. F. Hom. (Lond.) M.B.S. Hom. (Calcutta) *Secretary*

The Committee appointed a Working Group consisting of the following members to screen the initial drafts of the monographs prepared by the Staff, for the second volume and also to attend to the work of the Homoeopathic Pharmaceutical Codex :

1. Dr. P. N. Mehra *Member*
2. Shri G. S. Bhar *Member*
3. Dr. P. N. Varma *Member*
4. Dr. D. P. Rastogi *Secretary*

Dr. R. Ganapati, Chemist, Dr. B. S. Ahuja, Botanist and Dr. S. P. Singh, Research Officer (Homoeo.) rendered technical assistance to this group in preparing the monographs.

The Working Group which met ten times and the Committee which met six times have prepared another 100 monographs for the second volume of the Homoeopathic Pharmacopoeia of India.

The Government of India, Ministry of Health and Family Planning (Department of Health) takes these opportunities to record their appreciation of the work done by the Committee and the staff engaged on this work.

I N T R O D U C T I O N

The first volume of the Homoeopathic Pharmacopeia of India providing official standards for 180 drugs was finalised in 1970 and has since been published. The second volume, covers another 100 homoeopathic drugs.

The Committee considered it necessary to make certain amendments in the general notices and general instructions contained in the first volume. These amendments are given under general notices in this volume. These are applicable to the contents of the first volume also. The formal revision of the text of the latter will be made in the revised edition. The format of the monographs has also been slightly changed in the second volume as under :-

1. The word ‘Chemical Symbol’ has been changed to ‘Chemical formula’ in respect of compound, so as to be more specific.

2. The heading ‘Synonym’ has been restricted in case where it relates to a true synonym and in other cases it is replaced by common name. In case of chemicals alternate names have however been given without any specific title.

3. Part used has been mentioned after Description.

4. Under the heading ‘History and Authority’ the first prover has been mentioned in the first place and remaining authorities in alphabetical order.

5. The old Hahnemannian method of preparation has been discarded in favour of new uniform method with specific drug Strength which takes into consideration the moisture content of the drug, thus eliminating variation in standards. This method is applicable to most of the drugs and has been accepted by the Committee.

6. The title ‘Habitat’ has been substituted by term ‘Distribution’, to convey appropriate meaning.

The material compiled in this volume as in the previous one has been freely drawn upon from the British Homoeopathic Pharmacopoeia, American Homoeopathic Pharmacopoeia, the Homoeopathic Pharmacopoeia of United States, the German Homoeopathic Pharmacopoeia and the Indian Pharmacopoeia.

List of Monographs for H.P.I. Volume – II with Abbreviations

S. No.	Name of the Monograph	Abbreviation
1.	Abies Canadensis	Abies c.
2.	Absinthium	Absinth.
3.	Acidum Benzoicum	Ac. benz.
4.	Acidum Carbolicum	Ac. carbo.
5.	Acidum Hydrofluoricum	Ac. fluor.
6.	Acidum Picricum	Ac. pic.
7.	Acidum Salicylicum	Ac. salic.
8.	Acidum Sarcolacticum	Ac. sarco.
9.	Adonis Vernalis	Adonis. v.
10.	Aletris Farinosa	Alet. f.
11.	Alfalfa	Alfa.
12.	Alumen	Alumen
13.	Apium Graveolens	Apium gr.
14.	Aranea Diadema	Aran. d.
15.	Asarum Canadensis	Asar. can.
16.	Aurum Muriaticum Natronatum	Aur. m. n.
17.	Bismuthum Subnitricum	Bism. sub.
18.	Bromium	Brom.
19.	Cadmium Metallicum	Cad. met.
20.	Cadmium Sulphuricum	Cad. sul.
21.	Calcarea Iodata	Cal. iod.
22.	Capsicum Annuum	Cap. a.
23.	Carbonium Sulphuratum	Carb. sul.
24.	Carica Papaya	Carica p.
25.	Cascara Sagrada	Cascar. s.
26.	Chenopodium Anthelminticum	Chenop. a.
27.	Chimaphila Umbellata	Chimap. u.
28.	Chloralum	Chloral.
29.	Cholesterinum	Cholest.
30.	Cinnamomum	Cinam.
31.	Cobaltum Metallicum	Cob. met.
32.	Cobaltum Nitricum	Cob. nit.
33.	Coca	Coca
34.	Coccus Cacti	Coc. cac.
35.	Collinsonia Canadensis	Collin. c.
36.	Convallaria Majalis	Conval. m.
37.	Crocus Sativus	Croc. s.
38.	Crotalus Horridus	Crot. hor.
39.	Cundurango	Cundu.
40.	Cynodon Dactylon	Cynod. d.
41.	Damiana	Damian.
42.	Elaps Corallinus	Elapse. c.

S. No.	Name of the Monograph	Abbreviation
43.	Embelia Ribes	Embe. r.
44.	Eucalyptus Globulus	Eucal. gl.
45.	Equisetum Hyemale	Equis. hy.
46.	Filix Mas	Filix m.
47.	Glonoinum	Glon.
48.	Gossypium Herbaceum	Gossy. h.
49.	Guaiacum	Guaic.
50.	Ichthyolum	Ichthyo.
51.	Iris Versicolor	Iris. ver.
52.	Jaborandi	Jab.
53.	Jalapa	Jal.
54.	Juniperus Communis	Junip. c.
55.	Kali Bromatum	Kali. br.
56.	Kali Cyanatum	Kali. cy.
57.	Lithium Carbonicum	Lith. carb.
58.	Lobelia Inflata	Lob. in.
59.	Magnesium Phosphoricum	Mag. phos.
60.	Magnesia Sulphurica	Mag. sul.
61.	Manganum Aceticum	Mng. acet.
62.	Melilotus Alba	Mel. alb.
63.	Mentha Piperita	Men. pip.
64.	Menyanthes Trifoliata	Menyan. t.
65.	Morphinum Muriaticum	Morph. m.
66.	Moschus	Mosc.
67.	Naja Tripudians	Naja. t.
68.	Natrum Salicylicum	Nat. sal.
69.	Oleum Santali	Ol. santal.
70.	Passiflora Incarnata	Passi. in.
71.	Physostigma Venenosum	Physo. v.
72.	Plantago Major	Plant. m.
73.	Ratanhia	Ratan.
74.	Rheum	Rheum
75.	Rhododendron Chrysanthum	Rhodo. ch.
76.	Rhus Venenata	Rhus. ven.
77.	Rumex Crispus	Rumex c.
78.	Sabal Serrulata	Sab. ser.
79.	Salix Nigra	Salix. n.
80.	Sambucus Nigra	Samb. nig.
81.	Senecio Aureus	Sen. aur.
82.	Solanum Nigrum	Sol. nig.
83.	Stramonium	Stram.
84.	Strophanthus Hispidus	Stro. his.
85.	Sumbul	Sumbul
86.	Spigelia	Spig.

S. No.	Name of the Monograph	Abbreviation
87.	Tarentula Hispana	Tarent. h.
88.	Tellurium	Telluri
89.	Terebinthinae Oleum	Tereb. o.
90.	Terminalia Chebula	Term. ch.
91.	Tinospora Cordifolia	Tinospo.
92.	Valeriana Officinalis	Valer. of.
93.	Verbascum Thapsus	Verb. th.
94.	Veratrum Album	Ver. alb.
95.	Viburnum Opulus	Vib. op.
96.	Viburnum Prunifolium	Vib. p.
97.	Vipera Torva	Viper. t.
98.	Viscum Album	Vis. alb.
99.	Zincum Sulphuricum	Zinc. sul.
100.	Zingiber	Zing.

ABIES CANADENSIS
(Abies c.)

Botanical name : *Abies canadensis* Carr. **Family**: Pinaceae

Common name : *English*: Hemlock spruce.

Description : An evergreen forest tree, attaining a height from 18 to 25 m, with a trunk 60 to 90 cm or more in diameter, straight; bark rough. Branches slender, nearly horizontal, the uppermost pendulous at their apices; twigs pubescent; leaves stiff, short, flat, 2.5 cm in length, linear, obtuse, irregularly crowded, but mostly spreading in 2 directions thus appearing 2 ranked, these are dark rich glossy green above, whitish with a single silvery line on each side of the midrib underneath. Cones small 1 to 2.5 cm long and 2 cm thick with an outer corky layer and an inner fibrous layer, ovoid, terminal persistent.

Part used : Bark.

Macroscopical : Bark rough, about 5 mm thick, outer surface dark brown, inner surface striated, yellowish-brown. Fracture rough, shortly fibrous, showing groups of whitish stone cells. Taste strongly astringent, slightly turpentine. Odour slightly terbinthianate.

Distribution : North America.

History and authority : H. P. Gatchell, Mat. Med. Vol. X, 564. 1873 Mentioned in Allen's Encyclop. Mat. Med. Vol. I, 1. A Dictionary of Practical Mat. Med. Vol. I, 1.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Abies Canadensis in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	792 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

ABSINTHIUM
(Absinth.)

Botanical name : *Artemesia absinthium* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Absinthium vulgare* Lam., *Artemesia officinalis* Gater.

Common names : *Hindi*: Vilayati-afsantin; *English*: Wormwood, Absinth, Maderwort, Mugwort, Mingwort; *French*: Absinthe grande, Absinthe, Armoise amere, Absin menu, Absinthe commune; *German*: Wermuth, Alseikraut.

Description : Perennial, deciduous herb, 30 to 120 cm high. Stem erect, angular, ribbed, with whitish or greyish-green silky hairs; glandular and woody at base. Leaves alternate, petiolate, silky hairy, greyish-green above and whitish beneath, 7.5 cm long, 3 to 4 cm broad, 2 or 3 pinnatifidly cut into spreading linear or lanceolate obtuse segments, hairy on both surfaces; radical and lower cauline, narrowed into winged petioles; upper ones becoming smaller, narrower, lanceolate, short-petioled or sessile. Flowers yellow. Heads numerous 6 to 8 mm in diameter, pedicelled, hemispheric in drooping, second recemes terminating the branches. Florets tubular. Ray flowers female with corolla dilated below with 2 or 3 short-teeth. Disc flowers perfect and fertile, 5 toothed, style 2-cleft. Anthers acute-tongued at apex. Outer involucral bracts oblong, hairy, narrowly scarious, inner orbicular broadly scarious. Recepticular hairs long and straight. Fruit achene, elliptic, oblong or ovoid and 1 mm long.

Part used : Leaves and flowers.

Macroscopical : Drug brownish-green or yellowish-green, containing fragments of leaves which are silky hairs, greyish-green or whitish; tubular yellow corolla, anthers acute-tongued at apex and 2-cleft style.

Microscopical : Powder consists of a epidermal cells of leaves containing wavy-walls, stomata elliptical; non-glandular trichomes with shorter 3-celled stalk and a long spindle-shaped apical cell, glandular trichomes with 1 to 2 celled stalk and 4 to 8 celled head, fragments of mesophyll; whole and broken T-shaped non-glandular trichomes of bracts and long unicellular non-glandular hairs of florets; pollen grains spheroidal, 30 µ diameter; rosette aggregates of calcium oxalate 10 µ in diameter.

Distribution : Kashmir (1500 to 2100 m), Afghanistan, Europe, Algeria, United States, South Siberia, North Africa.

History and authority : Introduced into Homoeopathic Materia Medica by Gatchell. Allen's Encyclop. Mat. Med. Vol. I, 2. Hering's Guid. Symptoms. Vol. I, 71.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Absinthium in *coarse powder*	100 g
Purified Water	333 ml
Strong Alcohol	700 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ACIDUM BENZOICUM

(Ac. benz.)

Chemcial formula : C_6H_5COOH **Mol. wt.**: 122.10

Common names : Benzoic acid, Flowers of Benzoin; *French*: Acid benzoique; *German*: Benzoesaure.

Description : Colourless, light, feathery crystals or a white powder. Odour slight and characteristic. Somewhat volatile in moderately warm temperature and freely volatile in steam. Soluble in 75 parts of water, in 20 parts of boiling water; in 3 parts of alcohol (95 percent); readily soluble in solvent ether and chloroform. It may be prepared by the hydrolysis of benzotrichloride and the decarboxylation of phthalic acid. It contains not less than 99.5 percent of $C_7H_6O_2$.

Identification : The solution obtained by gently warming 0.2 g with 20 ml of water and 1 ml of 1 N sodium hydroxide and filtering yields a buff-coloured precipitate with ferric chloride solution.

Melting range : 121.5° to 123.5º.

Sulphated ash : Not more than 0.1 percent.

Cinnamic acid : Warm 0.1 g with 0.1 g of potassium permanganate and 5 ml of dilute sulphuric acid; no odour of benzaldehyde developed.

Assay : Dissolve about 2.5 g accurately weighed, in 15 ml of warm alcohol (95 percent) previously neutralised to phenol red solution, add 20 ml of water and titrate with 0.5 N sodium hydroxide using phenol red solutions as indicator. Each ml of 0.5 N sodium hydroxide equivalents to 0.06106 g of $C_7H_6O_2$.

History and authority : First proved by Jeanes in 1838. Also proved by Lingen, 1844 and Nusser in 1845. Allen's Encyclop. Mat. Med., Vol. I, 132. A Dictionary of Practical Mat. Med., Clarke, Vol. I, 274. Hering's Guiding Symptomps, Vol. II, 423.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Acidum Benzoicum 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x Drug strength 1/10

Acidum Benzoicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 1x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; and higher with *Dispensing Alcohol.*

Storage : Preserve in well-closed container.

ACIDUM CARBOLICUM
(Ac. carbo.)

Chemcial formula : C_6H_5OH **Mol. wt.**: 94.11

Common names : Phenol, phenic acid, hydroxy benzene, Phenylic acid; *French*: Acidie phenique; *German*: Carbolsaure.

Description : Colourless or faintly pink, needle-shaped crystals or crystalline masses; odour, characteristic and not tarry. Caustic. Deliquescent. Soluble in 12 parts of water; freely soluble in alcohol. Obtained from coal tar oil or may be prepared synthetically. It contains not less than 99.0 percent C_6H_6O.

Identification : (i) To 10 ml of a solution, add 1 drop of ferric chloride test solution; a violet colour is produced; add 10 ml of alcohol, colour of the solution changes to yellow.

(ii) A 1.0 percent w/w solution gives with bromine solution, a white precipitate, which on the continued addition of the reagent, at first dissolves and then reappears.

Boiling point : About 181º.

Freezing point : Not below 40º.

Clarity and acidity of solution : A solution, at 20º, of 1.0 g in 12 ml of water is clear; mix 5 ml of the solution with 5 ml of water and add 1 drop of methyl orange solution; a yellow but no orange or red colour is produced.

Non-volatile matter : When volatilised on a water bath and dried at 105º, leaves not more than 0.05 percent residue.

Assay : Dissolve about 2 g accurately weighed, in sufficient water to produce 1000 ml. Transfer 25 ml to a 500 ml glass-stoppered flask, add 50 ml of 0.1 N bromine, 5 ml of hydrochloric acid, insert the stopper, swirl occasionally, during half an hour and allow to stand for 15 minutes. Add 5 ml of a 20 percent w/v solution of potassium iodide, shake thoroughly and titrate with 0.1 N sodium thio-sulphate until only a faint yellow colour remains. Add a few drops of starch mucilage, 10 ml of chloroform and complete the titration with vigorous shaking. Repeat the operation without the phenol. The difference between titrations represents the amount of bromine required by the phenol. Each ml of 0.1 N bromine is equivalent to 0.001569 g of C_6H_6O.

Storage : Keep in a well-closed container, protected from light and store in a cool place.

History and authority : Introduced by C. Hering, but really proved only by Berridge. Mo. Hom. rev., V, 15, 297. Am. Jour. Hom. Med., Vol. VIII, 222. Allen's Encyclopedia Materia Medica, Vol. II, 590. Herring's Guiding Symptoms, Vol. III, 381. A Dictionary of Practical Materia Medica Clarke, Vol. I, 405.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Acidum Carbolicum — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

ACIDUM HYDROFLUORICUM

(Ac. fluor.)

Chemcial formula : HF **Mol. wt.**: 20.01

Common names : Hydrofluoric acid; *French*: Acide fluorhydrique; *German*: Wassrige FluB Saure.

Description : Almost colourless mobile fuming liquid, odour pungent and suffocating, poisonous. It readily attacks, dissolves glass and other siliceous materials. Miscible with water. Obtained by distilling calcium fluoride with sulphuric acid. Contains 40 percent HF.

Identification : (i) Sp. Gr. about 1.15.

(ii) Gives a white precipitate with calcium and barium salts.

(iii) No precipitate is formed with silver salts.

Heavy metals : 2 parts per million.

Residue on evaporation : Max. 0.002 percent.

Residue on ignition : Max. 0.001 percent.

History and authority : First proving was made under the direction of C. Hering. Hering's Guiding Symptoms, Vol. V, 328.

Preparation : (a) Mother solution Drug strength 1/10

Acidum Hydrofluoricum	250 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher up to 6x with Purified Water to be freshly prepared, 7x and higher with *Dispensing Alcohol.*

Storage : Acidum Hydrofluoricum and all its preparations below 4 potency should be kept in well-closed bottles, the interior of which is coated with paraffin or well-closed containers of paraffin, lead or wax.

Caution : Handle with care as it causes painful sores on the skin, usually noticed on the next day only; avoid inhaling the vapours. Not to be prescribed below 4x.

ACIDUM PICRICUM
(Ac. pic.)

Chemcial formula : $C_6H_2(OH)(NO_2)_3$ **Mol. wt.**: 229.11

Common names : Acidum carbazoticum, Trinitrophenol, Picric acid, Nitroxanthic acid; *French*: Acide picrique; *German*: Pikrinsaure.

Description : Pale yellow needles or crystals, odourless, intensely bitter taste; prepared by sulphonating phenol and then treating the reaction mixture with *nitric acid.* Contains not less than 99.0 percent of $C_6H_3N_3O_7$.

Specific gravity : 1.760 to 1.765.

Melting point : 121° to 123°.

Water insoluble matter : Maximum 0.02 percent.

Assay : Weigh accurately about 0.5 g of the sample, previously dried over sulphuric acid and dissolve it in 50 ml of warm water. Cool, add 2 drops of phenolphthalein and titrate with 0.1 N sodium hydroxide to pink colour. Each ml of 0.1 N sodium hydroxide is equivalent to 0.002291 g of $C_6H_3N_3O_7$.

History and authority : First proved by Parisel of Paris in 1868, later in America by L. B. Couch in 1874, Allen's Encyclop. Mat. Med., Vol. VII, 519. Hering's Guiding Symptoms, Vol. VIII, 437.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Piciricum in crystals	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol*.

(c) Mother Tincture ϕ — Drug strength 1/100

Acidum Picricum, in *crystalline powder*	10 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 3x and higher with *Dispensing Alcohol*.

Storage : Keep in well-closed containers, in cool place remote from fire.

Caution : Explosive when dry, rapidly heated or by percussion. Handle with care. For safety in transportation, it is mixed with 10 percent to 15 percent water. Not to be dispensed below 2x.

ACIDUM SALICYLICUM
(Ac. salic.)

Chemcial formula : $C_6H_4(OH)COOH$ **Mol. wt.**: 138.12

Common names : Orthohydroxy benzoic acid, Salicylic acid; *French*: Acide salicylique; *German*: Salicylisaure.

Description : Almost colourless or snow-white acicular crystals or a light feathery crystalline powder; almost odourless; taste, sweetish and acrid. Soluble in 460 parts of water; in about 15 parts of boiling water and in 3 parts of alcohol. Sublimes at 76º, when carefully heated. When rapidly heated at ordinary atmospheric pressure, it decomposes into phenol and carbon dioxide. Contains not less than 99.5 percent of $C_7H_6O_3$ with reference to the substance dried over silica gel for 3 hours.

Identification : A neutral solution gives with a solution of Ferric chloride an intense reddish-violet colour, which remains on addition of a little acetic and mineral acids.

Melting range : 158° to 161°.

Reaction : A 5 percent w/v solution is acidic to solution of methyl red.

Sulphated ash : Not more than 0.1 percent.

Assay : Weigh accurately about 3 g and dissolve in 15 ml of warm alcohol which has previously neutralised to solution of phenol red; add 20 ml of water and titrate with 0.5 N sodium hydroxide, using solution of phenol red as indicator. Each ml of 0.5 N sodium hydroxide is equivalent to 0.06906 g of $C_7H_6O_3$.

History and authority : Allen's Encyclop. Mat. Med. Vol. VIII, 473. A Dictionary of Practical Mat. Med. Clarke, Vol. III, 1064.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Salicylicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Tincture ϕ — Drug strength 1/10

Acidum Salicylicum	100 g

Strong Alcohol in sufficient quantity
to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 2x and higher with *Dispensing Alcohol.*

Storage : Preserve in a well-closed container protected from light.

ACIDUM SARCOLACTICUM

(Ac. sarco.)

Chemcial formula : $CH_3CH(OH)COOH$ **Mol wt.**: 90.08

Common names : L(+) Lactic acid, dextro rotatory lactic acid, para lactic acid, d-lactic acid.

Description : Colourless. Very deliquescent crystals or syrupy liquid. Soluble in water and in alcohol Formed in the muscle tissue during the stage of muscle exhaustion. Forms salts with many metals. Obtained by resolution of DL lactic acid.

Identification : (i) Crystals from acetic acid or chloroform have m. p. 53º.

(ii) pK at 25°, 3.79.

Specific rotation : $(\alpha)_{546.1}^{21^{o}-22^{o}}$ + 2.6°(C=2.5 in water).

Specific gravity : 1.245 to 1.250.

History and authority : Proved by Wm, B. Griggs. Mentioned in Materia Medica with Repertory, Boericke, 574, J.A.I.H. 33; 351, 1940. Journal of American Institute of Homoeopathy 33, 351, 1940.

Preparation : (a) Mother Solution Drug strength 1/10

Acidum Sarcolacticum 100 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x to 5x fresh with Purified Water; 6x and higher with *Dispensing Alcohol*.

Caution : 2x to 5x to be prepared with Purified Water for immediate use only; 6x and higher with *Dispensing Alcohol.*

ADONIS VERNALIS
(Adonis v.)

Botanical name : *Adonis vernalis* Linn. **Family**: Ranunculaceae

Common names : *English*: Pheasant's Eye, False Hellebore, Spring Adonis; *French*: Adonis; *German*: Summerteufelsauge.

Description : A deciduous, perennial herb, up to 50 cm in height. Stem simple or branched, longitudinally grooved, soft and weak, shining the branches mostly from near the base and resembling the main stem, naked below, except for some scale-like vestiges, densely foliaceous above; leaves 2 to 4 cm long and 1.5 to 3 cm broad, pinnately-divided into several segments, the large one of which are again divided, the ultimate segments being linear and acute. Flowers terminal, yellow usually, becoming cream-coloured on drying, from 3 to 6 cm in breadth; sepals 5, weak to brown to weak olive, hairy, ovate, obtuse, finely veined; petals from 5 to 20, light yellow to moderately greenish-yellow, concave, oblong, obtuse, finally veined and slightly longer than the sepals; stamens indefinite; carpels apocarpous, numerous, forming in the fruit an ovoid, obtuse, dense head of ovoid achenes, each tipped with a small persistent style. Odour faint; taste bitter and slightly acrid.

Part used : Whole plant.

Microscopical : Powder drug: dusky greenish-yellow to light olive; starch grains and calcium oxalate crystals few or absent; numerous fragments of the parenchyma of the medulla whose cells are up to 50 µ in width and 250 µ in length and exhibit porous walls; fragments of nrrrowly elongated sclerenchymatous fibres with lignified walls from 5 to 7 µ thick and with a few rounded or oblique simple pores; vessels either spiral or with bordered pores, up to 17 µ in width, epidermal cells of the stem and leaf stalks elongated in surface view, with elliptical stomata. Epidermis of the leaf blade show striated epidermal cells with wavy vertical walls and elliptical stomata up to 64 µ in length; red to orange fragments from the scales at the base of the stem, composed of elongated cells with rounded ends and orange to yellow walls.

Distribution : Northern Europe and Asia.

History and authority : A Dictionary of Practical Materia Medica, Clarke. Vol. I, 30. Materia Medica, Therapeutics & Pharmacology, A. L. Blackwood.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Adonis Vernalis in *coarse powder*	100 g
Purified Water	500 ml

Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ALETRIS FARINOSA

(Alet. f.)

Botanical name : *Aletris farinosa* Linn. **Family**: Liliaceae

Common names : *English*: True Unicorn-root, Stargrass, Starwort, Ague root, Unicorn root, Colic-root; *French*: Aletris farineux; *German*: Mehilige Aletris.

Description : Small deciduous, perennial herb. Rhizome horizontal or slightly oblique, cylindrical or laterally compressed above, 2 to 4 cm long, 3 to 12 mm in diameter. Leaves sessile or slightly sheathing at base, lanceolate, acute, ribbed, flat, pale, smooth, coriaceous, 7 to 20 cm long, 7 mm broad and in a spreading rosette. Flowers small, white or creamy-white, tubular, in spike-like raceme on a slender scape. Fruit capsule, ovate, tapering, coriaceous, enclosed by perianth; seeds minute and ribbed.

Part used : Rhizome and root.

Macroscopical : Rhizomes brownish to yellowish with circular, hollow stem scars; leaves base or stem base above; many tough, wiry, pale yellowish-grey to yellowish-brown, flexible roots below. Fracture short, yellow and mealy or slightly fibrous; pale yellow to moderately yellow; internally with scattered yellowish to fibrovascular bundles. Odour slight, acetous; taste starchy, sweetish and somewhat bitter.

Microscopical : Rhizome: epidermis one layered, with numerous glandular hairs, containing short 1-celled stalks and rounded heads; hypodermis with 1 to several layers of stone cells, some of which containing yellowish-orange substance; cortex parenchymatous, containing starch grains and raphides of calcium oxalate; closed, collateral leaves-trace bundles present; endodermis, an interrupted zone of several layers of yellow thick-walled cells; central cylinder broad, parenchymatous, containing starch grains, raphides of calcium oxalate and branching fibrovascular bundles consisting of small group of tracheae and sieve strands surrounded by several layer of thick-walled lignified sclerenchyma fibres possessing large oblique pores. Tracheae reticulate and porous.

Distribution : Eastern United States.

History and authority : Introduced into Homoeopathic practice in 1864 by Hale, New Rem. 34. Allen's Encyclop. Mat. Med. Vol. I, 146. Hering Guiding Symptoms Vol. I, 118.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aletris Farinosa in *coarse powder*	100 g
Purified Water	400 ml

Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

ALFALFA
(Alfa.)

Botanical name : *Medicago sativa* Linn. **Family**: Leguminosae (Fabaceae)

Common names : *Hindi*: Willayti gawath, Lasunghas; *English*: Lucerne, Chilean Clover, the Latin Medick.

Description : An erect, perennial herb with deep roots. Stem, 30 to 60 cm high. Leaflets trifoliate, narrowly obovate, margin serrate, apex acute. Flowers violet, in axillary racemes of 7 to 10 flowers; 3 to 4 cm Calyx, 5-toothed. Corolla, papilionaceous. Stamens 10, 9 united and one free. Fruit spirally twisted legume with 2 to 3 turns.

Part used : Whole plant excluding roots.

Microscopical : Leaflets: Epidermal cells with wavy anticlinal walls; upper epidermal cells, 14-25 to 50-70 µ, slightly smaller than the lower epidermal cells, which are 20-35 to 60-100 µ. Stomata on both surface, oval, 20 to 30 to 40 µ long and 10 to 20 to 25 µ wide, either cruciferous or ranunculaceous. Trichomes, rare on the upper surface, numerous over mid-rib on the under surface, consisting of 2-basal cells; 10 to 20 µ long and a linear terminal cell, 350 to 1120 µ long and 20 µ wide. Clavate glandular trichomes, 75 to 100 µ long, occur mostly on under surface and calyx; usually consisting of a stalk cell, an intermediate and a terminal cell, 25 µ wide with a rounded apex and often divided into 2 to 4 cells. Lamina, thin, transverse section showing 1 to 2 layered palisade and spongy parenchyma; the vascular bundles have fibres above and below; the cells of parenchyma abutting upon the fibres contain prism crystals of calcium oxalate, 8 to 15 µ by 4 to 8 µ wide. Corolla epidermis papillose having striated cuticle. Pollen grains spherical, 30 to 35 µ in diameter with 3 pores and 3 germinal furrows, exine smooth, contents granular.

Stem: almost of epidermal hairs, glandular 2 or more celled and unicellular trichomes, cortex of rectangular or oval cells, containing starch grains and crystals of calcium oxalate. Endodermis, usually without casparian bands. Outside the endodermis is a zone of chlorenchyma, limited peripherally by a single layer collenchyma except at the angles of stem. Vascular bundles collateral, conjoint and open. Mature stem continuous cambial ring is formed which produces continuous zone of lignified xylem. Parenchymatous cells of pith disintegrate to form a hollow.

Distribution : Throughout India.

History and authority : Proved by A. L. Blackwood. New, Old and Forgotten Remedies, Anshutz, 16.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Alfalfa, moist magma containing solids 100 g and moisture appx. 233 ml	333 g
Purified Water	117 ml
Strong Alcohol	680 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

ALUMEN
(Alumen)

Chemcial formula : $KAI(SO_4)_2.12\ H_2O$ **Mol. wt.**: 474.40

Common names : Aluminii et potassi Sulphas, Potassium alum, Potash alum, Alum; *French*: Sulfate d'alumine et potassa; *German*: Kali alaun.

Description : Colourless, transparent, large crystals or crystalline fragments or white crystalline powder; odourless; taste, sweetish and astringent. Stable at ordinary temperature. When heated it melts at about 200°. Loses its water of crystalisation with the formation of anyhydrous salt. Very soluble in water and practically insoluble in alcohol. Contains aluminium equivalent to not less than 99.5 percent of $KAI(SO_4)_2.12\ H_2O$.

Identification : Yields the reactions characteristic of aluminium, of potassium and of sulphates.

Reaction : The aqueous solution is acidic.

Ammonium salts : Dissolve 1 g in 1000 ml of ammonia-free water; to 10 ml of the solution add 40 ml of ammonia-free water and 2 ml of alkaline solution of potassium mercuric iodide; any colour produced is not deeper than in a control made by 2 ml of alkaline solution of potassium mercuric iodide to 1 ml of dilute solution of ammonium chloride (Nessler's) in 50 ml of ammonia-free water.

Assay : Weigh accurately about 2 g, dissolve in 300 ml of water, add 20 ml of solution of ammonium chloride, 5 drops of solution of methyl red and sufficient dilute ammonia solution to produce a distinct yellow colour in the mixture. Heat, to boiling and filter. Wash with 2.5 percent w/v solution of ammonium nitrate unless the precipitate is free from chloride. Dry the precipitate to constant weight at a temperature about 120° and weigh the residue of Al_2O_3. Each g of residue is equivalent to 9.307 g of $KAI(SO_4)_2.12\ H_2O$.

History and authority : Allen's Encyclop. Mat. Med. Vol. I, 192. A Dictionary of Practical Mat. Med. Clarke, Vol. I, 65. Hering's Guiding Symptoms, Vol. I, 138.

Preparation : (a) Trituration 1x — Drug strength 1/10

Alumen	100 g
Saccharum Lacits	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother solution — Drug strength 1/10

Alumen — 100 g

Purified water in sufficient quantity

to make one thousand millilitres of the Mother solution.

(d) Potencies: 2x to 5x with Purified Water to be prepared freshly for immediate use only. 6x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

APIUM GRAVEOLENS
(Apium. gr.)

Botanical name : *Apium graveolens* Linn. **Family**: Umbelliferae (Apiaceae)

Common names : *English*: Celery fruit, Celery seed; *Hindi:* Ajmod.

Description : An annual or biennial herb. Stem up to 2 to 4 m high, erect, branching. Radical leaves pinnate with deeply lobed segments, cauline 3-partite, segments once or twice trifid, coarsely toothed at the apex. Peduncle 6 mm or less. Umbel rays 5 to 10, pedicels 6 to 16. Flowers white, very small. Fruit 1 to 1.5 mm, ridges narrow, vittae broad.

Part used : Fruit

Macroscopical : Fruit are cremocarp, 1 to 1.5 mm long, 1.5 mm broad and 0.5 mm thick, sub spherical and laterally compressed, having two small stylopods and sometimes a slender straight pedicel; mericarps mostly separate, crescent shaped, glabrous, dark brown, with five straight ridges and commissural surface nearly flat. Transverse section in centre is pentagonal and shows a brown pericarp 6 to 9 vittae; endosperm dense and oily having an embryo near apex. Odour characteristic and aromatic; taste aromatic and slightly camphoraceous.

Microscopical : The diagnostic characters are the polyhedral epidermal cells with slightly wavy anticlinal walls and the outer walls radiately striated and frequently papillose; the conspicuous endocarp tissue is narrow, brown, thin-walled, lignified tangentially arranged cells; the brown vittae, with a secretory epithelium and transverse walls at intervals; the large proportion of endosperm is composed of thick walled polyhedral cells, containing fixed and aleurone grains, each of which enclosed a rosette crystal of calcium oxalate.

Distribution : Cultivated in India (Particularly Punjab & U.P.); Europe and U.S.A.

History and authority : Allen's Encyclopedia Materia Medica, Vol. I, 422. A Dictionary of Practical Materia Medica, Clarke, Vol. I, 145.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Apium Graveolens in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing alcohol.*

ARANEA DIADEMA
(Aran. d.)

Zoological name : *Epeira diadema* Linn. **Family**: Epeiridae

Synonym : *Araneus diadematus* Clerck.

Common names : *English:* Diadem Spider, Papal crossspider; *French*: Araignee a croix papule; *German*: Kreutz Spinne.

Description : The spider is readily distinguished from others of its species by its large globular abdomen. Its mandibles are used exclusively for biting. The head thorax is attached to the abdomen by a slender pedicel. Respiration is carried on by both the lungs and the trachea. The abdomen, which is not divided into segments is often as large as a small nut. A longitudinal line of yellow and white spots traverse the back and is crossed by three similar lines. The web is composed of spiral threads, crossed by other threads radiating from centre.

Part used : Whole animal.

Distribution : Europe and America, in stables, old walls etc.

History and authority : First proving are recorded in A.H.Z.I., 122. Allen's Encyclopedia Materia Medica, Vol. I, 433. Hering's Guidings Symptoms, Vol. V, 88. A Dictionary of Practical Materia Medica, Clarke, Vol. I, 152.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Aranea Diadema in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	724 ml

Macerate the insect in *Strong Alcohol* according to the method described at Vol. I, H.P.I.

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain, one part Mother Tincture, two parts Purified Water and seven parts *Strong alcohol*; 3x and higher with *Dispensing Alcohol.*

ASARUM CANADENSIS

(Asar. can.)

Botanical name : *Asarum canadense* Linn. **Family**: Aristolcchiaceae

Common names : *English*: Wild snake root, Wild ginger, Colt's food, Heart-root, Kidney-leaved asarabacca; *French*: Assaret du Canada; *German*: Canadische Haselwurzel.

Description : A soft, pubescent, perennial herb with creeping, fleshy, somewhat jointed rhizome. Stem short, forked before leaving the ground, each bearing a reniform mucronate leaf, 7 to 10 cm long and 7 to 12.5 cm broad with long, round petiole. A solitary brown flower appears from fork of stem on a pendulous peduncle. Calyx brownish-purple; corolla absent. Fruit a capsule.

Part used : Root and Rhizome.

Macroscopical : Rhizome occasionally branched, 2-edged when young, quadrangular when older, finely striate, usually more or less twisted, from 5 to 17 cm in length and 2 to 4 mm in thickness; nodes enlarged with irregular scars from petioles and remains of pedicels, internodes with annular scars from scales; weak reddish-brown to moderate yellowish-brown externally, fracture short, internally pale brown to pale yellow, starchy or resinous; attached roots few, up to 7 cm in length and not over 1 mm in thickness, each having a 4 to 6 rayed fibrovascular bundle. Odour aromatic, non-irritating upon heating; taste pungent and slightly bitter.

Microscopical : Powdered drug, pale brown to light yellowish-brown shows numerous simple and 2 to 4 compound starch grains, many with a distinct central hilum, the individual grains from 3 to 20 µ in diameter; fragments of brownish epidermal cells with occasional uniseriate non-glandular hairs; vessels with scalariform, reticulate or spiral thickenings; fragments of parenchyma, some of the cells of which have suberized walls and contain oil or resin.

Distribution : North and Central United States.

History and authority : Introduced into Homoeopathic practice by Hale in 1867. Mentioned in New Remedies, Hale, IInd Ed. 96 Materia Medica Therapeuties and Pharmacology, A. L. Blackwood.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Asarum Canadensis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

AURUM MURIATICUM NATRONATUM

(Aur. m. n.)

Chemcial formula : $NaAuCl_4.2H_2O$ **Mol. wt.**: 398.05

Common names : Aurum et natrum muriaticum, Auri et natri chloridum; Chloride of gold and sodium, Gold Sodium chloride; *French*: Chloure d'or et de sodium; *German*: Natrium gold chlorid.

Description : Orangish-yellow, long, four sided crystalline powder; odourless; taste, metallic; light sensitive and deliquescent. Freely soluble in water. Prepared by mixing solution of equal quantities by weight of sodium chloride and auric chloride and crystallisation. Contains about 49.0 percent of Gold (Au).

Identification : (i) With solution of sodium hydroxide a brown precipitate is formed which is soluble in excess of alkali.

(ii) The addition of hydrogen peroxide to an alkaline solution and slight warming produces a purple or purplish-blue colour.

Assay : Weigh accurately about 200 mg and dissolve in sufficient quantity of water. Add 50 ml of saturated solution of oxalic acid and heat the solution to 80° to 90° for 20 minutes. Then add another 50 ml of oxalic acid solution and heat for another 20 minutes. Cool the solution to room temperature and filter through a close grained double filter paper. Wash the filter paper with 1.0 percent hydrochloric acid and then with warm water. The precipitate is dried, ignited, cooled and weighed as Gold (Au).

History and authority : It was first proved by Lembke in Germany. Also proved by Hale and Clarke. Allen's Encyclop. Mat. Med., Vol. II, 18. Hering's Guiding Symptoms, Vol. II, 304.

Preparation : (a) Trituration 1x — Drug strength 1/10

Aurum Muriaticum Natronatum in *crystalline powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I. 9x and higher with *Dispensing Alcohol*.

(c) Mother Solution — Drug strength 1/10

Aurum Muriaticum Natronatum in crystalline powder	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x to contain one part Mother Solution, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

Storage : Keep in a well closed container, protected from light.

BISMUTHUM SUBNITRICUM

(Bism. sub.)

Chemcial formula : $6Bi_2O_3$, $5N_2O_5.9H_2O$ (approx.)

Common names : Bismuthi Subnitras, Basic Bismuth Oxynitrate, Bismuthum album, Bismuth Paint; *French*: Sous-azoate de Bismuth; *German*: Basisches Wismuth nitrat.

Description : A white, slightly hygroscopic, heavy powder; tasteless. Its suspension in water is faintly acid to litmus paper (pH about 5). It is practically insoluble in water and in alcohol, but dissolves readily in excess of hydrochloric or nitric acid. It is slowly hydrolised in water with liberation of nitric acid. Prepared by pouring a solution of Bismuth nitrate into water containing sodium hydroxide washing the precipitate free from soluble nitrate and drying. When dried at 105° yields not less than 79.0 percent and not more than 81.0 percent of Bi_2O_3.

Identification : Yields reactions characteristic of Bismuth and of nitrates.

Loss on drying : Dry at 105° for 2 hours; it loses not more than 3 percent of its weight.

Carbon and insoluble matter : It dissolves completely in an equal quantity of warm nitric acid without effervescence.

Residue on ignition : 79.0 to 81.0 percent.

Assay : Weigh accurately in a silica crucible about 1 g of Bismuth subnitrate previously dried at 105° for 2 hours and ignite to constant weight. From the weight of Bi_2O_3, so obtained determine the percentage in the sample taken.

Storage : Preserve in well closed containers.

History and authority : Hahnemann proved it and published its result in 1827. Hering's Guiding Symptoms,Vol. II, 465. Allen's Encyclop. Mat. Med. Vol. II, 186. A Dictionary of Practical Mat. Med., Clarke, Vol. I, 287.

Preparation : (a) Trituration 1x — Drug strength1/10

Bismuthum Sub Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, , Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol*.

BROMIUM
(Brom.)

Chemical symbol : Br_2 **Mol. wt.**: 159.84

Common names : Bromine, Bromum; *French*: Brome; *German*: Brom.

Description : A dark reddish-brown, heavy mobile corrosive liquid which gives off intensely irritating brown fumes. Soluble 1 in 30 by weight of water; freely soluble in most organic solvents. Contains not less than 99.0 percent of Bromine.

Identification : (i) The vapours of bromine gives an orange-yellow colour to filter-paper moistened with solution of starch.

(ii) Bromine is soluble in a few drops of carbon disulphide or chloroform forming a reddish solution.

(ii) Addition of a saturated solution of phenol to an aqueous solution of bromine yields a white precipitate.

Specific Gravity : 3.1 to 3.14.

Limit test for chloride : Dissolve 1 g in 10 ml of a solution of ammonia and add 65 ml of water followed by 25 ml of nitric acid; bring to vigorous boiling and completely expel the bromine by passing a rapid current of air through the solution for 20 minutes while cooling; the residual liquid requires not more than 1.4 ml of 0.1 N silver nitrate for complete precipitation.

Limit test for iodine : Boil 0.2 ml with 20 ml of water and 0.2 ml of 1 N sulphuric acid and a small piece of marble until the liquid is almost colourless. Cool, add one drop of liquefied phenol, allow to stand for 2 minutes, then add 0.2 g of potassium iodide and 1 ml of solution of starch; no blue colour is produced.

Assay : Weigh accurately about 0.2 g into 35 ml of potassium iodide solution, titrate with 0.1 N of sodium thiosulphate using starch mucilage as indicator. Correct for the amount of chloride present as determined in the limit test for chloride. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.007992 g of Bromine.

History and authority : Proved by C. Hering in 1838 and later, proved by Lembke in lower and Berridge in higher potencies. Allen's Encyclop. Mat. Med., Vol. II, 229, X, 392. Hering's Guiding Symptoms, Vol. II, 508.

Preparation : (a) Mother Solution — Drug strength 1/100

Bromium in saturated aqueous solution (Strength 1/33)	330 ml

Purified Water 670 ml

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x and higher up to 5x, with Purified water; 6x and higher with *Dispensing Alcohol*.

Storage : Bromium and all its preparations below 4x potency should be kept in glass stoppered bottles, well closed in a cool place. Handle with great care as it causes severe burns and blisters when brought into contact with the skin. Solutions and potencies up to 5x should be stored in a dry cool place protected from light and preferably should be prepared fresh for use.

CADMIUM METALLICUM
(Cad. met.)

Chemical symbol : Cd **At. wt.**: 112.40

Common name : Cadmium.

Description : A silver-white, blue tinged lustrous metal, soft, easily cut with a knife. Available in the form of a grey granular powder obtained as vapours, when roasting zinc ores. Cadmium salts are more toxic than those of zinc. Insoluble in water, readily soluble in dilute nitric acid. Almost unattached by cold, but converted into sulphate by hot sulphuric acid.

Identification : A solution in dilute nitric acid produces a yellow precipitate with hydrogen sulphide in the presence of ammonium hydroxide. Sp. Gr.: 8.65.

Melting point : 321°

Assay : Weigh accurately 0.2 g and dissolve in a small quantity of dilute nitric acid. Dilute and precipitate cadmium as its sulphide by passing hydrogen sulphide gas in the presence of ammonium hydroxide. Filter the precipitate. Wash, dry for one hour at 110° and weigh. Each l g of cadmium sulphide is equivalent to 0.7781 g of Cd.

History and authority : "Hahnemann Proving after 1924" by Jame Stephens.

Preparation : (a) Trituration l x Drug strength 1/10

Cadmium Metallicum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, , Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IV

CADMIUM SULPHURICUM
(Cad. sul.)

Chemcial formula : $3CdSO_4.8H_2O$ **Mol. wt.**: 769.516

Common names : Cadmii sulfas, cadmium sulphate; *French*: Sulfate de cadmium; *German*: Kadmium sulfat.

Description : Colourless monoclinic crystals; odourless, somewhat efflorescent; taste metallic, soluble in 1.5 parts of water, insoluble in alcohol.

Identification : (i) An aqueous solution gives a white precipitate with ammonia, soluble in excess of the reagent.

(ii) With hydrogen sulphide, a yellow precipitate is formed.

Assay : Dissolve 1 g in 50 ml of water, add 25 ml of strong ammonia solution and titrate with 0.1 M EDTA, using methyl thymol blue as indicator, until the blue solution becomes colourless or grey. Each ml of 0.1 M EDTA is equivalent to 0.02565 g of $3CdSO_4.8H_2O$.

History and authority : Introduced into Homoeopathic Materia Medica by Petros of Spain in 1854 after proving. Hering's Guiding Symptoms, Vol. III, 91. Allen's Encyclop. Mat. Med, Vol. II, 330.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cadmium Sulphuricum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, , Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution — Drug strength 1/10

Cadmium Sulphuricum in *coarse powder*	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x and 3x with Purified Water to be freshly made for immediate use, 4x and higher with *Dispensing Alcohol.*

CALCAREA IODATA
(Cal. iod.)

Chemcial formula : $CaI_2 . 6H_2O$ **Mol. wt.**:293.90

Common names : Calcii iodas, Calcium Iodide; *French*: Iodate de Calcium; *German*: Calcium iodid.

Description : A white, very deliquescent, lumps of powder. Soluble in 0.5 parts of water, freely soluble in alcohol. On exposure to air becomes yellow and incompletely soluble due to absorption of CO_2 and liberation of iodine.

Identification : Yields reactions characteristic of calcium and of iodide.

Reaction : An aqueous solution is neutral or slightly alkaline.

Storage : Keep tightly closed and protected from light.

History and authority : Proved by W. Jas Blakely; A Manual of Homoeopathic Pharmacodynamics, Richard Hughes, 374. Allen's Encyclopeida Materia Medica, Vol. II, 392. A Dictionary of Practical Mat. Med., Clarke, Vol. I, 356.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Iodatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, , Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol*.

(c) Mother Tincture ϕ — Drug strength 1/10

Calcarea Iodatum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 2x and higher with *Dispensing Alcohol.*

CAPSICUM ANNUM
(Cap. a.)

Botanical name : *Capsicum annum* Linn. **Family**: Solanaceae

Common names : *Hindi*: Lal Mirch, Gachirch; *English*: Bird Pepper, Red pepper, Cayanne pepper, Chilly, Guinrs Pepper; *French*: Poivred'Inde, P. d' Espagne; *German*: Spanisher Pfeffer.

Description : An annual herb, 60 cm or more in height. Stem angled, smooth. Leaves alternate, petiolate, glabrous, broadly ovate-acuminate, 7.5 to 15 cm in length. Flowers solitary, axillary, greenish-white or white. Calyx cup-shaped, embracing base of fruit. Corolla rotate. Fruit pungent, oblong-conical berry, up to 3.5 cm in length.

Part used : Ripe fruit with seeds.

Macroscopical : Fruit dull orange-red to brownish-red, oblong conical, obtuse, 2-celled, up to 35 mm long and 10 mm in width, sometimes attached to 5-toothed calyx and slender pedicel; pedicel and calyx upto 3 cm in length. Pericarp somewhat shrivelled, glabrous, translucent and leathery, containing about 10 to 20 brownish-yellow, flat subreniform seeds, 3 to 4 mm in length, attached to thin, reddish dissepiments.

Microscopical : Pericarp: cuticle thick and striated. Outer epidermis of sub-rectangular cells, in rows of 5 to 7 with moderately and evenly thickened anticlinal walls; mesocarp of 6 to 10 layers of thin-walled parenchymatous, many cells containing red oily drops, some with microspheroidal or prismatic crystals, the inner layer of thin-walled giant cells; inner epidermis of small thin-walled cells and groups of sclereids with lignified slightly wavy, moderately thickened pitted walls, 1 group over the cavity of each giant cell. Dissepiment, with epidermis showing in parts between the cuticle and outer cell walls, oily vesicles sometimes containing crystals of capsicin. Testa, with epidermis of very large cells having yellowish thick sinuous pitted anticlinal walls, outer walls thinner, smoothly cuticularised; inner walls with wavy thickening and small oval pits; endosperm or cellulosic parenchyma, containing drops of fixed oil and aleurone grains, 3 to 6 μ in diameter. Calyx, outer epidermis with cruciferous stomata, inner epidermis with no stomata and many glandular trichomes with uniseriate stalks and multicellular heads; mesophyll with many idioblasts containing microsphenoidal crystals and a few small vascular bundles. Pedicel, 1 mm thick; epidermis of somewhat axially elongated sub-rectangular cells with numerous stomata and scattered glandular trichomes; cortex of 7 to 8 layers of thin-walled cellulosic parenchyma with occasional idioblasts, containing microsphenoidal crystals of calcium oxalate; endodermis large celled; pericycle, with single row of fibres, isolated or in groups of 2 to 3; phloem in narrow ring; xylem with radiating

medullary rays; perimedullary phloem, with fibres on the inner border. Pith, parenchymatous with a large central hollow.

Distribution : India, South America and other warmer regions of the world.

History and authority : Introduced by Hahnemann in 1805. Allen's Encyclop. Mat. Med. Vol. II, 540, X, 432. Hering's Guiding Symptoms, Vol. III, 321.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Capsicum Annum, moist magma containing solids 100 g and moisture 50 ml	150 g
Strong Alcohol	958 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

CARBONIUM SULPHURATUM
(Carb. sul.)

Chemcial formula : CS_2 **Mol. wt.**: 76.14

Common names : Carbonii bisulphidum, carbon disulphide, carbon bisulphide, Alcohol sulphuric liquid, Dithio-Carbonic anhydride; *French*: Sulfure de carbon; *German*: Schwefelkohlestoff.

Description : A clear, colourless or yellowish, mobile highly refractive and very inflammable liquid. Poisonous. Insoluble in water, miscible with alcohol and other; has a foul smell. Prepared by heating charcoal with vapourised sulphur.

Identification : It burns with a blue flame, forming CO_2 and SO_2.

Specific gravity : 1.260 to 1.270.

Boiling range : Not less than 95.0 percent distills between 46° and 47°.

Water : Cool 10 ml in a test tube to 0°. No turbidity or drops of water appear.

Non-volatile matter : When evaporated, on a water bath and dried at 105°, leaves not more than 0.005 percent w/w of residue.

History and authority : Proved by Permerl and Noch. Mentioned in "A Manual of Homoeopathic Pharmacodynamics", Richard Hughes, 8th Ed., 394. Introduced into Homoeopathic Materia Medica by Buchner, Germany. Allen's Encyclop. Mat. Med., Vol. II, 617, X, 425; 653. Mentioned in Hering's Monograph on Carbon Sulph. 1870 and poisoning effects by Bernhardt. Hering's Guiding Symptoms, Vol. III, 397.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Carbonium Sulphuratum	100 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Storage : Keep in tightly closed container, in a cool place, remote from flame.

Revised Monograph Appeared in HPI Vol. VIII

CARICA PAPAYA

(Carica p.)

Botanical name : *Carica papaya* Linn. **Family**: Caricaceae

Common names : *English*: Melon tree; *Hindi*: Papeeta; *French*: Figuier des eles, Figuier de negres.

Description : Small tree, 2 to 6 m high, tapering above 12 to 13 cm in diameter at top. Stem erect, soft and spongy wooded, hollow and bearing numerous leaf-scars. Leaves large, palmately 7-lobed, lobes divided into secondary lateral lobes, 60 cm across, long, hollow-petioled, arising horizontally from the stem. Flowers: yellow, generally dioecious, occasionally a few pistillate flowers on male plants; staminate, flowers in long drooping panicles and pistillate in sub-solotary or short-clusters. Ovary 1-celled, stigma sessile, 5-lobed, lacerated. Fruit large, melon-like, 25 cm long, 7 to 12 cm broad, green or dingy greenish yellow, long stalked and arising below the crown of leaves. Seeds numerous, black, enclosed in sweet mucous pulp and covered with a loose hyaline skin or arillus; testa thick, brittle.

Part used : Green unripe fruit excluding seeds.

Macroscopical : Flesh of the fruit is of yellowish white colour with its peculiar flavor. The epicarp adheres to fleshy sarcocarp which surrounds the central cavity containing a mass of nearly black seeds.

Distribution : Commonly throughout India.

History and authority : Mentioned in Drugs of Hindoosthan, S. C. Ghose, V ed. 120.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Carica papaya, *moist magma* containing solids 100 g and plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts Purified Water and five Parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

CASCARA SAGRADA

(Cascar. s.)

Botanical name : *Rhamnus purshiana* DC. **Family**: Rhamnaceae

Common names : *English*: Chittembark, Sacred bark; *German:* Amerikanische, Faulbaumrince; *French*: Ecorce sacrete.

Description : A small tree, up to 10 m in height, with reddish-brown bark and flexuous branches. Leaves petiolate, elliptical, acuminate, serrulate, sometimes entire, dull green above and pubescent beneath. Flower in axillary umbellate cyme, green. Fruit turbinate, purplish-black, drupe, about 8 mm in length, composed of indehiscent cocci.

Part used : Bark, at least two years old.

Macroscopical : Occurs in flattened or transversely curved pieces or quills of variable length, up to 5 mm thick; outer surface dark brown purplish-brown or brownish-red, longitudinally-ridged, frequently more or less covered with patches of greenish lichens bearing black apothecia, sometimes with numerous lenticels and occasionally with moss; inner surface light yellow to reddish-brown or dark brown in old mature bark, longitudinally striate, becoming red when moistened with alkaline solutions; fracture short with projection of bast fibres in the inner bark; odour distinct; taste bitter and slightly acrid. Gives red to reddish-brown colour when treated with ammonina.

Microscopical : Cork, yellowish-brown, purple or reddish-brown composed of several layers of rectangular cells. Cortex consists of 2 regions; outer zone of 2 or 3 rows of brownish collenchymatous cells and inner broader zone of tangentially elongated, cortical parenchyma. Imbedded within the latter are numerous yellow groups of 20 to 50 stone cells. Phloem consists of very broad zone, composed of irregularly elongated, phloem masses separated from each other by medullary rays, which are frequently curved and converging in the outer phloem region. Each phloem mass consists of numerous sieve tubes and phloem cells, some of which contain spheroidal starch grains while other have monoclinic prisms or rosette aggregates of calcium oxalate. Groups of bast fiberes are embedded in phloem masses in tier-like fashion; each group more or less surrounded by a row of crystal fibres, each of which contains a monoclinic prism of calcium oxalate. Medullary rays possess brownish contents and take red colour with alkaline solution.

Distribution : California, British Columbia.

History and authority : A Dictionary of Practical Materia Medica Clarke, Vol. I, 432.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cascara Sagrada in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x — Drug strength 1/10

Cascara sagrada in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 1x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol.*

CHENOPODIUM ANTHELMINTICUM
(Chenop. a.)

Botanical name : *Chenopodium ambrosioides* Linn., *Var. anthelminticum* A. Gray **Family**: Chenopodiaceae

Common names : *English*: American wormseed, Stinking-weed, Worm goose-foot; *French*: Semences de chenopode anthelminituqe; *German*: Amerikanischer Wurmsamen.

Description : Herbaceous, leaves slightly petioled, oblong-lanceolate, toothed, the upper ones entire and tapering at both ends. Flowers small, numerous, yellowish-green and occur in numerous small clusters or globular spikes, arranged in the axils of slender, lateral, leafy branches. The calyx is 5-cleft, lobes ovate, pointed; stamens 5, ovary covered on the top with small, oblong, stalked glands; styles 2 to 3. Fruit is perfectly enclosed in the calyx, obtusely angled; seed smooth and shining, the embryo forming about 3 quarters of a ring around the mealy albumen.

Part used : Whole plant.

Macroscopical : Fruit: Small and sub-globular, each surrounded by the 5-partite perianth, from 0.7 to 1.0 mm in diameter, very light and dull greenish-yellow or brownish in colour. The odour is strong and peculiar (like eucalyptus) and the taste is pungent and bitter. On gently rubbing the fruit, the perianth and membranous pericarp are removed, exposing a single, shining, black, lenticular seed about 0.5 to 0.9 mm in diameter, containing a strongly curved embryo and a scanty endosperm. Fruits occasionally occur in small groups, attached to short pieces of stem.

Distribution : Throughout India, Southern United States and Central America.

History and authority : Proved by J. Jeanes in 1842, Rame's Record, 1872, 30. Allen's Encyclopedia Mat. Med., Vol. III, 180. Hering's Guiding Symptoms, Vol. IV, 41.

Preparation : (a) Mother Tincture — Drug strength 1/10

Chenopodium Anthelminticum in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	737 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

CHIMAPHILA UMBELLATA

(Chimap. u.)

Botanical name : *Chimaphila umbellata* (Linn.) Barton. **Family**: Ericaceae

Common names : *English*: American Wintergreen, Pipsisewa, Rheumatism weed; *French*: Herbe de pyrole ombellee; *German*: Doldenbluthiges Harnkraut.

Description : Small evergreen, perennial shrub with creeping yellow rhizome. Aerial stems creeping, erect or semi-procumbent, angular, possessing scars of former leaves, woody at base, 10 to 30 cm high. Leaves: oblanceolate or cuneate-lanceolate, sharply dentate or entire, 3 to 6 cm long, short-petioled and whorled; upper surface dark-green, shining and coriaceous, under surface paler. Flowers 2 to 8, white or pinkish, 10 to 15 mm wide, corymbose or sub-umbellate; depressed, anthers violet, filaments swollen and ciliolate at part. Fruit capsule, 5-celled, linear and chaffy.

Part used : Whole plant.

Macroscopical : Drug moderately yellowish brown to light olive, containing entire and broken coriaceous leaves and a few angular stem species. Odour slight; taste astringently sweetish and bitter.

Microscopical : Powder consists of epidermal cells of leaves containing unevenly thickened wavy walls, broadly elliptical stomata on lower epidermis, fragments of mesophyll containing chloroplastids and tannin, parenchyma containing reddish brown to yellowish orange amorphous substance; fragments of stem epidermis containing a purplish pigment; rosette aggregates of calcium oxalate, 65 µ in diameter, simple, spheroidal, 2 to 4 compound starch grains; fragments of sclerenchyma fibres; tracheae with spiral or annular thickening and long thick walled, lignified cells containing minute reticulations.

Distribution : Temperate Asia, North America, Canada, Mexico, Japan, Siberia and Europe.

History and authority : Proved by Jeanes in 1840 by G. Bute in 1856 and later introduced in homoeopathic literature by Hale. Allen's Encyclop. Mat. Med., Vol. III, 181. Hering's guiding Symptoms Vol. IV, 54.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Chimaphila Umbellata in moderately *coarse powder*	100 g
Purified Water	300 g

	Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *dispending alcohol*.

Storage : Protected from light.

CHLORALUM
(Chloral)

Chemcial formula : $CCl_3.CH(OH)_2$ **Mol. wt.**: 165.40

Common name : Chloral hydrate.

Description : Colourless crystals; odour pungent, but not acrid; taste pungent and rather bitter. Volatilises slowly on exposure to air. Soluble in 0.25 parts of water and in 1.3 parts of alcohol. It may be prepared by the addition of water to chloral, which is produced by the action of dry chlorine on ethyl alcohol. Contains not less than 99.0 percent of $C_2H_3Cl_3O_2$.

Identification : (i) Liquifies between 50º and 58°.

(ii) Decomposed by caustic alkalies, liberating chloroform.

Reaction : pH of a 10 percent w/v solution, 3.6 to 4.4.

Chloride : 3.0 g complies with limit test for chlorides.

Sulphated ash : Not more than 0.1 percent.

Chloral alcoholate : Warm 1 g with 6 ml of water and 0.5 ml of solution of sodium hydroxide; filter, add sufficient 0.1 N iodine to impart a deep brown colour and set aside for 1 hour; no yellow crystalline precipitate is produced and no smell of iodoform is perceptible.

Assay : Dissolve about 4 g accurately weighed, in 10 ml of water and add 30 ml of 1 N sodium hydroxide. Allow the mixture to stand for 2 minutes and titrate with 1 N sulphuric acid, using phenolphthalein solution as indicator. Titrate the neutralised liquid with 0.1 N silver nitrate, using potassium chromate as indicator. To the amount of 1 N sulphuric acid used in the first titration add two-fifteenths of the amount of the 0.1 N silver nitrate used in second titration and deduct the figure, so obtained from the amount of 1 N sodium hydroxide added. Each ml of 1 N sodium hydroxide represented by the difference is equivalent to 0.1654 g of $C_2H_3Cl_3O_2$.

Storage : Keep in a well-closed container.

History and authority : Proved by W. Eggert & S. Swan etc. Allen's Encyclopedia Materia Medica, Vol. III, 253. Hering's Guiding Symptoms, Vol. IV, 87. A Dictionary of Practical Materia Medica, Clarke, Vol. I, 502.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Chloralum in crystals 100 g

Strong Alcohol in sufficient quantity
to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

CHOLESTERINUM
(Cholest.)

Chemcial formula : $C_{27}H_{46}O$ **Mol. wt.**: 386.64

Common name : Chloesterin, Cholesterol.

Description : A white or faintly yellow, almost odourless, pearly leaflets or granules. It is insoluble in water; sparingly soluble in alcohol. Soluble in vegetable oils. It is a principal sterol in the higher animals. Found in all body tissues, especially in the brain, spinal cord and in animal fats and oils. Main constituent of gallstones. Prepared from the spinal cord of cattle by petroleum ether extraction of the non-sapoinifiable matter. Purification is done by repeated bromination.

Identification : To a solution of 10 mg in 1 ml of chloroform, add 1 ml of sulphuric acid, the chloroform acquires a blood red colour and the sulphuric acid shows a green fluorescence.

Specific gravity : 1.050 to 1.052.

Melting range : 147° to 150°.

Loss on drying : Looses not more than 0.3 percent of its weight, when dried in vacuum at 60° for 4 hours.

Residue on ignition : Not more than 0.1 percent.

Acidity : Dissolve 1 g in 10 ml of solvent ether in a small flask, add, 1 ml of 0.1 N sodium hydroxide and shake for about a minute. Heat gently to expel the ether and then boil for 5 minutes. Cool, dilute with 10 ml of water and titrate with 0.1 N sulphuric acid using 2 drops of solution of phenolphthalein as indicator. Repeat the experiment with the same quantities of the same reagents, in the same manner, omitting cholesterol and make any necessary correction; not less than 9.7 ml of 0.1 N sulphuric acid is consumed.

Solubility in alcohol : Dissolve 500 mg in 50 ml of warm alcohol in a stoppered flask or cylinder and allow to stand at room temperature for 2 hours; no deposit or turbidity is formed.

History and authority : A Dictionary of Practical Materia Medica, Clarke, Vol. I, 507. Materia Medica, Thercepeutics & Pharmacology, Blackwood, 240.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cholesterinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

CINNAMOMUM
(Cinam.)

Botanical name : *Cinnamomum zeylanicum* Nees. **Family**: Lauraceae

Common names : *Hindi*: Dalchini, Kalmi Dalchini; *English*: Cinnamon; *French*: Canelle; *German*: Zimmt.

Description : An evergreen tree, 6 to 10 m high with erect trunk, 30 to 45 cm in diameter, smooth, ash-coloured bark and numerous wide-spreading, declining branches. Leaves opposite, petiolate, bright green above, pale green. Panicles as long as or not much longer than leaves, sometimes terminal; flowers grey-silky; fruit dark purple, elongate, ellipsoid up to 2.5 cm long, supported by much enlarged perianth.

Part used : Inner bark.

Macroscopical : Occurs in long, slender, flexible sticks about 1 m in length and 6 mm in width, each consisting of numerous channeled pieces or single quills about 1 to 2 cm wide. Outer surface dull yellowish-brown, marked with pale wavy longitudinal lines and with occasional small scars or holes; inner surface darker in colour, striated with elongated reticulation. Bark is about 0.5 mm thick; brittle, fracture splintery; free from all but traces of cork.

Microscopical : Outermost layer consists of continuous band 3 to 4 cells wide of pericyclic lignified sclerenchyma, on the outer margin of which small groups of 6 to 15 pericyclic fibres occur at intervals, pitted sclereids often more thickened in the inner walls and other three, contain few starch grains. Sieve tubes arranged in tangential bands, completely collapsed in outer layers; sieve plates on transverse walls. Phloem fibers occurs singly or in short tangential rows of 2 to 5, lignified, colourless, slender, 12 to 22 to 35 µ wide and 200 to 500 to 650 µ long. Parenchyma consists of sub-rectangular cells, containing starch grains, 5 to 10 µ in diameter. Some cells containing scattered minute needles of calcium oxalate. Medullary rays usually 2-seriate, widening slightly towards pericycle; many cells contain minute needles of calcium oxalate and starch grains.

Distribution : India and Ceylon.

History and authority : Mentioned in Homoeopathic literature in 1855, Hirschel's Archiv. f. r. u. a. Arzneiwir Kunguslehre, I, 195. Allen's Encyclop. Mat. Med. III, 333; X, 470, 654. Hering's Guiding Symptoms, Vol. IV, 214.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cinnamomum in *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration: 1x	Drug strength 1/10
Cinnamomum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration

(d) Potencies: 1x and higher to triturated in accordance with the method,Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alchol.*

COBALTUM METALLICUM

(Com. met.)

Chemcial formula : Co **At. wt.**: 58.933

Common names : Cobalt; *German*: Kobalt.

Description : A steel-grey hard magnetic, ductile somewhat malleable metal, crystallises in hexagonal or cubic form. Stable in air at ordinary temperature. Density 8.92, obtained by passing a current of pure hydrogen gas through a solution of cobalt chloride. Soluble slowly in hydrochloric acid and sulphuric acid; readily soluble in *nitric acid.* Contains not less than 98.0 percent of Co.

Identification : A solution of cobalt in dilute nitric acid yields:-

(i) A blue precipitate with sodium hydroxide solution; the colour rapidly changing to olive green.

(ii) With ammonium hydroxide in the presence of ammonium chloride, the precipitate formed, redissolves.

Assay : Weigh accurately about 0.25 g of cobalt and dissolve in sufficient quantity of dilute nitric acid , add water and make upto 100 ml. Add 4 g of hydroxyl ammonium chloride and 25 ml of strong ammonia solution. Titrate at 89° with 0.1 M EDTA, using methyl thymol blue as indicator; until the colour changes from blue to purple. Each ml of 0.1 M EDTA is equivalent to 0.005894 g of Co.

History and authority : Introduced into Homoeopathic Materia Medica by Dr. Hering. Mentioned in Allen's Encyclop. Mat. Med., Vol. III, 361.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cobaltum metallicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher by trituration in accordance with the method described at Vol. I, H.P.I., 6x may be converted to liquid potency 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol*.

COBALTUM NITRICUM
(Cob. nit.)

Chemcial formula : $Co(NO_3)_2.6H_2O$ **Mol. wt**.: 291.05

Common name : Cobaltous nitrate.

Description : Red monoclinic crystals; somewhat deliquescent. Soluble in 1 part of water, 1 part of alcohol. Melts at about 55° to red liquid, which becomes green and decomposes above 74° to its oxide. Contains not less than 97.5 percent of $Co(NO_3)_2.6H_2O$.

Identification : (i) Yields reactions characteristic of nitrates.

(ii) Yields reactions characteristic of cobalt, described under Cobaltum metallicum.

Specific gravity : About 1.883.

Assay : Dissolve about 1.0 g accurately weighed in 300 ml of water. Add 2 g of hydroxyl ammonium chloride and proceed as under cobaltum metallicum. Each ml of 0.1 M EDTA is equivalent to 0.02910 g of $Co(NO_3)_2.6H_2O$.

History and authority : Maring G., Allgemeine Homoeopatische Zeitung, 203: 419, 1958.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cobaltum Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol*.

(c) Mother Tincture ϕ — Drug strength 1/10

Cobaltum Nitricum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 2x and higher with *Dispensing Alcohol*.

COCA
(Coca.)

Botanical name : *Erythroxylum coca* Lamarck. **Family**: Erythroxylaceae

Synonym : *Erythroxylon tuxillense* Rusby.

Common names : *English*: Huanaco coca, Truxillo coca, Cocae folia, Bolivian coca.

Description : Shrub, 1 to 2 m high. Branches slender, rusty brown bearing leaves at extreme tips. Leaves entire, oval, obovate or elliptical thick, coriaceous, brownish-green or dark green, shortly and stoutly petioled, 3.5 to 7 cm long, 2.5 to 3.5 cm wide, glabrous, apex acute or mucronate, base tapering; veinlets prominent on upper surface; midrib reddish-brown, depressed and traversed by a slight ridge on upper surface, prominent and followed on either side by a curved longitudinal line from base to apex on lower surface. Flower yellow 5-lobed, 5 to 6 mm across, in clusters of 3 to 5, borne below leaves on the stem of preceding year, which is reddish. Odour faint; taste bitter, followed by numbness.

Part used : Leaves, recently dried and carefully selected, preserving their characteristic order.

Microscopical : Epidermis with straight anticlinal walls, a few cells containing mucilage or prisms of calcium oxalate; lower epidermis with papillose cells, rubiaceous stomata, 6 to 7 rows of parenchymatous cells over raised curved lines; upper epidermis with a prominent ridge of collenchyma above the midrib, stomata absent; palisade 1-layered, central and spongy mesophyll with numerous intercellular spaces and crystals of calcium oxalate. Numerous lignified idioblasts near curved lines on undersurface. Markedly developed sclerenchyma above and below side-veins. Midrib, xylem in an arc with bands of phloem and pericyclic fibres below and sclerenchyma above.

Distribution : India, Java, Ceylon and America.

History and authority : Proved by Mueller in Germany in 1856. Allen's Encyclop. Mat. Med., Vol. III, 369. Hering's Guiding Symptoms Vol. IV, 244.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Coca in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x	Drug strength 1/10
Coca in moderately *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

COCCUS CACTI

(Coc.cac.)

Zoological name : *Dactylopius coccus* Costa **Family**: Coccidae

Common names : *Hindi*: Kerm dara; *English*: Grana fina, Cochineal insect; *French*: Cochenille; *German*: Coccionella, Scharlachwurm.

Description : Oval or sub-globular, 3.5 to 6 mm long, 9 to 11 segmented, grayish-purple or grayish-black or purple-black to dusky red purple, dorsal surface convex, ventral surface concave containing 2-straight and 7-jointed antennae at anterior end, 3-pairs short legs each terminating in a claw, a mouth containing long, filliform proboscis composed of 1-paired mandibles anteriorly and a pair of maxillae posteriorly, 2-pairs spiracles, anterior pair being between the middle and hind legs; wings absent. Entire surface chitinous with thin waxy coating, numerous short truncate spines and solitary or clustered, tubular or spinnerate wax-glands containing thick-rims around glandular openings. Numerous larvae possessing coiled proboscides and tubular wax-glands are present in each female insect, killed by immersion in hot water and thereafter dried in sun or ovens, built for the purpose.

Part used : Dried female insect.

Macroscopical : Powder dusky to dark red; contains numerous fragments or muscle fibres, chitinous exoskeleton containing wax-glands, larvae with coiled proboscides, occasional claws and leg fragments, fragments of antennae and chitinous styles. Odour characteristic; taste slightly bitter imparting red colour to saliva.

Distribution : Mexico, Peru, Central America, Spain and West Indies.

History and authority : Proved by Wachtel and other Austrian provers. The complete symptomology was first published in Metcalf's new Homeopathic Proving, 1863. Allen's Encyclop. Mat. Med. Vol. III, 402. Hering's Guiding Symptoms, Vol. IV, 291. A Dictionary of Pract. Mat. Med., Clarke, Vol. I, 550.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Coccus Cacti in moderately *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

(c) Trituration1x	Drug strength1/10
Coccus Cacti in moderately *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

COLLINSONIA CANADENSIS

(Collin. c.)

Botanical name : *Collinsonia canadensis* Linn. **Family**: Labiatae (Lamiaceae)

Common names : *English*: Canada Snake-root, Hard-hack, Stone-root, Heal-all Horse or Ox-balm, Horse-weed, Knob's grass, Knot-root, Rich-weed, Rock-weed; *French*: Baume de cheval; *German*: Collinsonie.

Description : A perennial, deciduous herb, up to 1.5 m in height with a hard, nearly horizontal rhizome with irregularly branches. Stem smooth, somewhat angular. Leaves, 10 to 24 cm long, broadly ovate to oblong, cordate at base, opposite, petiolate, simple. Flowers in simple or panicled, naked, terminal racemes. Flower greenish-yellow, numerous, lamon-scented.

Part used : Rhizome.

Macroscopical : The rhizome occurs in irregularly, very hard, greenish brown pieces from 5 to 10 cm in length and 1 to 2 cm in diameter. The upper surface bears the remains of short, conical buds and conspicuous scars of aerial stems. One lower surface has short wiry roots or its depressed scars are present. Fracture short. The transverse section shows a wide brown cork, a narrow cortex containing starch and a large whitish pith surrounded by a ring of thin, dark wedges of wood. The drug is odourless and tasteless.

Microscopical : The diagnostic features of the drug are that the pith and wide medullary rays are lignified and contain starch. Starch is also present in the cortex. The starch grains are simple and except a few rich consists of two components. The simple grains are cylindrical, reniform, ovoid or oblong and vary from about 3 to 38 µ in length.

Distribution : Found in rich moist woods and Indigenous to United States of America and Canada.

History and authority : Mentioned in Homoeopathic literature in 1857 by Carroll, N. A. J. Hom. V 548. Mentioned in Hale's New Remedies. First proved by Burt in tincture and later by Dowla in trituration. Mentioned in A Dictionary of Pract. Mat. Med., Clarke, Vol. I, 568. Allen's Encyclop. Mat. Med. III, 507, X, 476. Hering's Guiding Symptoms, Vol. IV, 357.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Collinsonia Canadensis in *coarse powder*	100 g
Purified Water	500 ml

Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

CONVALLARIA MAJALIS
(Conval. m.)

Botanical name : *Convallaria majalis* Linn. **Family**: Liliaceae

Common names : *English*: May Lily, Lily of the Valley; *French*: Muquet *German*: Maigolckchen.

Description : A low, acaulescent perennial herb; its subterranean portion consists of a branched, creeping, horizontal rhizome bearing 3 to 9 rootlets from its nodes. Aerial portion consists of 2 to 3 oblong, parallel-veined leaves with long sheathing petioles. Flowers fragrant, white, bell-shaped with 6 curved lobes, nodding on an angled scape 15 cm high, bearing 1 sided raceme; stamens 6; ovary is superior and trilocular. Flowers appear in May. Fruits are red berries.

Part used : Whole plant.

Macroscopical : Rhizome horizontal or oblique, elongated, usually branched, cylindrical, variable in length, form 1 to 3 mm in diameter, externally moderate yellow to light brown; nodes with an occasional circular hollow stem scar and with 3 to 9 thin, tortuous, brown, branching roots or root remnants or root scars at each node; occasional terminal or lateral buds up to 8 mm in thickness and with many scales; occasional groups of annulate leaves scars; fracture short or fibrous; internally whitish. Odour indistinct, taste sweetish, becoming bitter and acrid.

Microscopical : Rhizome: in transverse section shows a layer of epidermal cells with outer walls highly cutinized; cortex of about 20 rows of parenchyma cells, containing more or less spherical starch grains, others raphides of calcium oxalate. Endodermis of usually 2 layers or occasionally 1 to 3 layers, the radial and inner walls of which are strongly thickened and lignified; stele a broad central region consisting of a matrix of starch and crystals bearing parenchyma through which course closed collateral and concentric fibrovascular bundles, the bundles arranged in an interrupted circle just within the endodermis.

Roots: in transverse section show a hairy epidermis; hypodermis of a single layer; cortex of about 6 rows of cells, some containing starch, raphides of calcium oxalate or oil; an endodermis of thin-walled cells whose radial and inner walls are slightly more thickened than the outer walls and with casparian spots on their radial walls; cambial layer, polyarch stele and central pith.

Distribution : Europe, Asia and South-eastern United States.

History and authority : Mentioned in Homoeopathic literature, Hahnemann Monthly, XVI, 692, November, 1881. A Dictionary of Practical Materia Medica,

Clarke, Vol. I, 589. A Text Book of Materia Medica and Therapeutics Cowperthwaite, 290. Materia Medica, Therapeutics and pharmacology, A. L. Blackwood, 265.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Convallaria Majalis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Storage : Cool dry place.

CROCUS SATIVUS
(Croc. s.)

Botanical name : *Crocus sativus* Linn. **Family**: Iridaceae

Common names : *Hindi*: Kesar, Zafran; *English*: Saffron, Hay saffron, Fall crocus; *German* & *French*: Safran.

Description : A perennial, low growing, bulbous plant; corm globular producing 6 to 9 sessile leaves surrounded in lower part by 4 or 5 broad membranous scales. Flowers terminal on scape. Perianth pale reddish-purple forming cylindrical tube about 10 cm long terminating in 6 oblong oval segments; stamens 3 and carpels 3, inferior; style slender, elongated, pale yellow in perianth tube and divided in upper region into 3 drooping, stigmas deep red. Ovary 3-celled.

Part used : Dried stigmas of flowers.

Macroscopical : Stigmas 3, united or separate, attached to style; usually about 25 mm in length, cornucopia-shaped, dark red colour, margin fimbriate or dentate; styles about 10 mm in length, more or less cylindrical, solid, moderate yellowish-brown to yellowish-orange; odour strong, characteristically aromatic; taste bitter, aromatic. Upon chewing the saliva coloured bright orange-yellow.

Microscopical : Stigma consists chiefly of elongated, thin-walled parenchyma containing colouring matter and covered by a thin-walled epidermis. Distal end of stigma shows numerous bladdery, cylindrical papillae or trichomes, up to 150 µ in length; pollen grains few, smooth, spherical, 40 to 120 µ in diameter, occasionally germinated and exhibiting pollen tubes.

Distribution : India (Kashmir), Southern Europe and Asia.

History and authority : Proved by Stapf and Gross in Germany in 1836. Allen's Encyclop. Mat. Med. Vol. III, 578, X, 495. Hering's Guiding Symptoms, Vol. IV, 473.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Crocus Sativus in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

CROTALUS HORRIDUS
(Crot. hor.)

Zoological name : *Crotalina hosridus* Daud. **Family**: Crotalicae

Common names : *English*: Rattles snake; *North American*: Rattle snake, Banded-rattle-snake.

Description : Body 100 cm long, yellow-tawny to blackish-brown with a rattle-like black tail containing 6 to 20 depressed horny rings, each ring possessing a tongue-shaped portion posteriorly; belly light coloured. Head broad, triangular, with a deep scaly pit on each side below and in front of the eyes parietal and frontal scale like, nasal plate divided; fangs large, hollow, recurved containing 2 large ones, 1.9 cm long and 4 to 6 undeveloped pairs of such ones 0.30 to 1.3 cm long; neck contracted; the back and sides covered with keeled scales, the belly with unkeeled plates; mouth with venom sacs containing venom which forms precipitate with alcohol. Specific gravity of venom is 1.054.

Part used : Venom; procured by compressing the gland when the serpent is either pinioned in a frame or under the influence of chloroform.

Macroscopical : Fresh venom greenish-yellow; odourless; tasteless; reactions acid. Dried venom yellow, solid, fragile, transparent or translucent particles.

Distribution : North America and Europe.

History and authority : First proved by Hering. Most complete account of the remedy has been mentioned in the monograph of J. W. Hayward forming part of Materia Medica Psychological and Applied. Hayward also proved it. Allen's Encyclop. Mat. Med. Vol. III, 588. Hering's Guiding Symptoms, Vol. IV, 484. A Dictionary of Pract. Mat. Med. Clarke, Vol. I, 613.

Preparation : (a) Trituration — Drug strength 1/10

Crotalus Horridus	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol.*

(c) Mother solution — Drug strength 1/100

Crotalus Horridus	10 g
Glycerine	990 ml

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 3x and higher up to 5x to contain one part Mother Solution, three parts Purified Water and six parts *Glycerine*. 6x and higher with *Dispensing Alcohol*.

Caution : Not to be prescribed below 3x.

Revised Monograph Appeared in HPI Vol. VIII

CUNDURANGO
(Cundu.)

Botanical name : *Marsdenia cundurango* Nichols. **Family**: Asclepiadaceae

Common names : *English*: Condor-vine Bark, Eagle-vine Bark; *French*: Ecorcede Cundurango; *German*: Kondurangorinde.

Description : A vine from 3 to 10 m long with smooth, ash-grey bark, more or less marked with green or black lichens. Leaves opposite, round-oblong, acute, hairy beneath. Flowers whitish; corolla somewhat campanulate.

Part Used : Dried bark.

Macroscopical : Bark in quills or transverse pieces, up to 13.5 cm in length, 1 to 7 mm in thickness; outer surface pale brown to dark-brown, nearly smooth or more or less scaly and rough with numerous lenticels or warts; inner surface finely longitudinally stiriated, pale brown to weak yellowish-orange, fracture short, fibrous in outer portion and granular in inner portion; odour indistinct to slightly aromatic; taste aromatic and bitter.

Microscopical : Cork of several layers of suberized cells, occasionally lignified and having yellowish brown contents. Secondary cortex about 10 layers of parenchymatous cells, some contain simple or 2 to 4 compound starch grains, others prismatic crystals. Primary cortex, some cells contain starch grains, others rosette aggregates of calcium oxalate and scattered groups of stone cell. Pericycle of tangentially-elongated parenchyma having latex cells, group of thick-walled, non-lignified to slightly lignified sclerenchyma fibres. Phloem of numerous phloem masses, separated by 1 to 2 cells wide medullary rays. Phloem patches contain groups of sieve tubes, companion cells, phloem parenchyma with starch or rosettes of calcium oxalate, latex cells, few or no bast fibres and large groups of stone cells.

Distribution : South America.

History and authority : Proved by J. C. Burnett & K. K. Dinsmore, England. Mentioned in Homoeopathic literature in 1871 by Dunham. Allen's Encyclop. Mat. Med. Vol. IV, 1. Hering's Guiding Symptoms, Vol. V, 1.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cundurango in moderately *coarse powder*	100 g
Purified water	500 m

Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

(c) Trituration 1x	Drug strength1/10
Cundurango in *coarse powder*	100 g
Saccharam Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 1x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

CYNODON DACTYLON
(Cynod. d.)

Botanical name : *Cynodon dactylon* Pers. **Family**: Graminae (Poaceae)

Common names : *English*: *Bermuda* grass; *Hindi*: Dub, Durba, Durva; *French*: Chiendent pied de poule.

Description : Stem slender, prostrate, widely creeping, forming matted tufts with slender erect or ascending flowering branches, 7.5 to 30 cm high. Leaves 2 to 10 cm by 1.25 to 3 mm, narrowly linear or lanceolate, finely acute to macronate more or less glaucous, soft, smooth, usually conspicuously distichous in the barren shoots and at the base of stems sheath tight, glabrous or hairy, sometimes bearded at the mouth; ligule very fine ciliate. Spikes 2 to 6, radiating from the top of a slender peduncle, 2.5 to 5 cm long, green or purplish. Spikelets 1.7 to 2.5 mm long. Floral glumes, obliquely oblong to semi ovate, about 2 mm long. Anthers oblong, 1 mm long. Seed approx. 1 mm long.

Part used : Whole plant.

Macroscopical : The rhizome occurs in short, straight pieces, hollow except at the nodes, about 3 to 20 mm long and 2 to 3 mm in diameter, straw-coloured, lustrous. At the nodes small, circular, root scars and somewhat larger stem scars. No odour but possesses a faint, sweetish taste. A transverse section is circular in outline.

Microscopical : The epidermis consists of longitudinally arranged rows of rectangular cells. Cortex about 1/4 of the radius in breadth, then a band of pericyclic sclerenchyma in which are embeded the outer circle of vascular bundles and a hollow pith in the centre. Starch is present in abundance.

Distribution : Common throughout India.

History and authority : Drugs of Hindoosthan, S. D. Ghose, IV Edition, 143. Jugal Kishore, British Hom. Journal Vol. LIX. Hahnemannian Gleanings Vol. 38, April, 1971, 171.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cynodon Dactylon, moist magma containing solid 100 g and moisture contents 300 ml	400 ml
Purified Water	100 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

DAMIANA
(Damiana)

Botanical name : *Turnera diffusa* Willd
Var. *aphrodisiaca* Urb. **Family**: Turneraceae

Synonym : *Turnera aphrodisiaca* Willd.

Description : A small shrub; leaves smooth and pale green on upper side, underneath glabrous, with a few hairs on the ribs, ovate-oblanceolate, shortly petiolate with two small glands at base; flowers yellow rising singly from axils of the leaves; capsule one celled, splitting into three pieces; aromatic; taste characteristic, aromatic, bitter and resinous.

Part used : Whole plant.

Macroscopical : Leaves are pale-green or yellowish green in colour about 10 to 25 mm long and 5 to 10 mm wide, broadly lanceolate and shortly petiolate. Margin is serrate with three to six comparatively large teeth on each side. The surface is smooth, veins pinnate and prominent on lower surface. Odour and taste aromatic.

Microscopical : Leaves: the upper epidermis is formed of cells with almost straight walls and without stomata and the lower epidermis with somewhat wavy walls and abundant stomata (oval). An isobilateral mesophyll is present. The trichomes are simple, filiform, unicellular, upto 900 µ long often undulating and bent near the base with unlignified, strongly thickened walls and a warty surface. There are numerous, small clusters and occasional prisms of calcium oxalate.

Stem: reddish-brown, cork cells are thin walled and parenchyma in the pith is lignitied. Stone cells few and occasional starch grains, upto 12 µ in diameter.

Distribution : Indigenous to Texas and Mexico.

History and authority : A Dict. of Pract. Mat. Med., Clarke, Vol. III, 1469.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Damiana in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	685 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ELAPS CORALLINUS

(Elapse. c.)

Zoological name : *Elaps corallinus* **Family**: Elapidae

Common names : *English*: Coral snake, Coral viper.

Description : Head of this snake is small, round and depressed with a short, broad muzzle and is not separated from the body by a distinct neck. The jaws have very sharp teeth and the fangs stand alone in upper jaw. Body is covered by smooth scales which form bands of bright black and red; these rings are equi-distant. About 200 transverse shields cover the belly. The muzzle and forehead are black, as long as the first ring of the neck. The length of the snake is about 80 cm and is very poisonous.

Part used : Venom; pressed from the venom sac of living snake.

Distribution : Brazil.

History and authority : Introduced into Homoeopathic Mat. Med. by Mure, Brazil. Allen's Encyclop. Mat. Med., Vol. IV, 190. Hering's Guiding Symptoms, Vol. V, 186. A Dict. of Pract. Mat. Med., Clarke, Vol. I, 696.

Preparation : (a) Mother Solution ϕ — Drug strength 1/100

Elaps Corallinus	10 g
Glycerine	990 g

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x and higher up to 5x with Glycerine; 6x and higher with *Dispensing Alcohol.*

(c) Trituration 2x — Drug strength 1/10

Elaps Corallinus	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(d) Potencies: 3x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. IX

EMBELIA RIBES
(Embe. r.)

Botanical name : *Embelia ribes* Burm. f. **Family**: Myrsinaceae

Common name : *Hindi:* Beberang.

Description : A large scandent shrub; branches long, slender, flexible, terete with long internodes; the bark studded with lenticels. Leaves coriacious 5 to 9 by 2 to 3.8 cm, elliptic or elliptic-lanceolate, shortly and obtusely acuminate, entire, glabrous on both sides, shining above, paler and somewhat silvery beneath, the whole surface covered with minute reddish sunken glands (conspicuous in young leaves); base rounded or main nerves numerous, slender; petiole 6 to 16 mm long, glabrous. Flower pentamerous, numerous, small in lax; panicled racemes which are terminal and from the upper axils; branches of the panicle 7.5 to 10 cm long, bracts minute; calyx about 1.25 mm long, sepals connate; petals 5, greenish-yellow, free, 4 m long, elliptic, sub-obtuse; stamens 5, shorter than petals. Fruit globose, 3 to 4 mm in diameter, smooth, succulent, black when ripe; lipped with persistent style.

Part used : Dried fruits.

Macroscopical : Fruits spherical, about 4 mm in diameter, varying in colour from red to nearly black; warty. Shortly pedicellate, with a persistent calyx. The pericarp is brittle and encloses a reddish seed which is covered with a thin membrane; on removing this, the seed is covered with light spots. Seed is depressed at the base and has a horny and slightly ruminated endosperm.

Distribution : Throughout India.

History and authority : Drugs of Hindoosthan, S. C. Ghose, Ed. V., 150.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Embelia Ribes in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

EUCALYPTUS GLOBULUS

(Eucal. gl.)

Botanical name : *Eucalyptus globulus* Lab. **Family**: Myrtaceae

Common names : *English*: Blue gum leaves, Australian fever tree leaves, Iron bark tree; *French*: Feuilles d' Eucalyptus; *German*: Eucalyptus Blattes.

Description : A very tall tree, with ash-grey bark; opposite leaves on younger branches but alternate leaves on older ones. Flowers white, the calyx-tube of each is covered by a coniacallid called the operculum and is composed of limb of calyx and united petals. The fruit is a woody truncated capsule.

Part used : Leaves.

Macroscopical : Petiole twisted; lamina lanceolate, scythe-shaped, bifacial, 8 to 30 cm in length and 2 to 7 cm in breadth, coriaceous; apex when present acute or acuminate; base unequal, obtuse or somewhat rounded; margin uneven, revolute; ventral and dorsal surfaces greyish-green to pale yellowish-green, more or less glaucous, glabrous, glandular-punctate, with numerous small, rounded, brown dots or cork; venation pinnate-reticulate, the veins of the first order running to within a short distance from the margin where they anastomose with each other and form a vein nearly parallel with the margin. Odour aromatic, bitter and cooling.

Microscopical : Leaf: upper and lower epidermis composed of clear polygonal, epidermal cells with thick cutinised outer walls. Both epidermises possess sunken stomata; mesophyll chlorenchymatous differentiated into palisade and spongy parenchyma, palisade being present below both the epidermises and consists of 3 or 4 rows of cells; palisade contains large, sub globular, internal glands lined with secretory epithelium and containing yellow oil drops. Spongy parenchyma, a narrow zone of more or less loosely arranged cells between the palisade, with some of its cells containing rosette aggregates, while others possessing monoclinic prisms of calcium oxalate, up to 25 µ in diameter. Fibrovascular tissue courses through the spongy parenchyma. In the midrib and petiole a more or less interrupted arc of slightly lignified pericyclic fibres occurs just outside these bundles.

Distribution : Australia, Tasmania, Southern Europe and California. Introduced in Niligiris, Anamalai, Palni, Simla hills and Shillong.

History and authority : Mentioned in Homoeopathic literature in 1869 by Roder, All'g Hom. Zeit. 78, 46. Allen's Encyclop. Mat. Med., Vol. IV, 228. A Dict. of Pract. Mat. Med.; Clarke, Vol. I, 720.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Eucalyptus Globulus, moist magma containing solids 100 g and plant moisture approx. 100 ml	200 g
Strong Alcohol	914 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

EQUISETUM HYEMALE
(Equis. hy.)

Botanical name : *Equisetum hyemale* Linn. **Family**: Equisetaceae

Common names : *English*: Dutch rush, Horse tail, Polishing rush, Scouring rush, Shave grass; *French*: Prele; *German*: Schachtelhalm.

Description : Perennial, evergreen herb, upto 3 m high, with creeping rhizome and a tall, stout, rush like, hollow and jointed stem having well defined nodes and longitudinally ribbed internodes; leaves very small, simple, scale like, arranged in whorl at the nodes; cone-like strobili at tips of aerial shots.

Part used : Whole plant.

Microscopical : Stem, generally outline of transverse section of internodes of aerial shoot is wavy due to presence of ridges and grooves. Epidermis, 1-layered. Below ridge is present a vertical strand of sclerenchyma giving support and rigidity, but below groove a patch of chlorenchyma. A lysigenous intercellular air cavity (vallecular canal)-lies beneath each groove. Sunken stomata present in grooves. Stele, siphon stele consisting of a ring of conjoint, collateral vascular bundles. Xylem 'V'-shaped, having phloem between limbs.

Rhizome: is similar to aerial stem but differs in having simple cortex without chlorenchyma and sunken stomata, poor development of mechanical tissues and solid pith.

Leaf: supplied by a collateral vascular bundle surrounded by endodermis, xylem poorly developed.

Distribution : U.S.A.

History and authority : The drug was first proved by Hugh M. Smith, U. S. in 1876. Mentioned in Homoeopathic literature in 1873 by Hale, Hale's New Remedies 3rd. Ed. Allen's Encyclop. Mat. Med., vol. IV, 204, X, 512. Hering's Guiding Symptoms, Vol. V, 205.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Equisetum Hyemale in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol; 3x* and higher with *Dispensing Alcohol.*

FILIX MAS
(Filix m.)

Botanical name : *Drypteris filix-mas* (L.) Schott. **Family**: Polypodiaceae

Common names : *English*: Male fern; *French*: Fougere male; *German*: Mannliches Farrenkraut.

Description : A deciduous, perennial herb, with stout oblique rhizomes, up to 2.5 cm in diameter, but appear much larger due to many matted fibres forming a tufty head, blackish and scaly, with numerous long slightly branched, filiform roots. Leaves 30 to 90 cm long, bi-pinnate erect, appearing like a plume, bearing 40 to 50 pairs of pinnate, each about 15 cm long having 20 to 30 pairs of pinnules which are oblong, serrated towards tips which are blunt. 8 to 10 sori present on each pinnule; these have reniform indusia each attached by notch to veinlet.

Part used : Rhizome.

Macroscopical : Rhizome, cylindrical-ovoid, dark brown to black, entirely covered with hard, persistent, curved, angular, dark brown bases of fronds, 3 to 6 cm long and 5 to 8 mm thick. Both young fronds and frond bases are clothed externally with numerous brown chaffy scales termed ramenta; each ramentum is triangular, lanceolate, 1-cell thick and 10 to 30 mm long. Breaks with a short fracture exhibiting a green and starchy interior. Transverse section is irregular in outline, shows 6 to 9 vascular strands (meristeles) of varying sizes arranged in a circle. Transversely cut surface of frond base, oval with 2 projections towards upper less-curved side and 7 to 9 meristeles in circle.

Microscopical : Ground tissue of rhizome consists of a round parenchyma containing abundant starch grains which are simple, rounded, 12 to 25 µ in diameter. Within the ground tissue are numerous large intercellular spaces into which project unicellular, sub-spherical or club shaped internal glands, when secrete greenish oleo-resin. Hypodemal layer consists of 2 or 3 rows of fibrous sclerenchyma having brown walls but not lignified. Each meristele, concentric with central xylem of prismatic tracheids with scalariform or rarely, spiral thickenings, surrounded by pericycle and an endodermis. Ramenta composed of thin-walled, somewhat elongated cells having marginal teeth, each consisting of adjacent projecting portions of 2 cells. Two small unicellular glands are present at base of each ramentum. Calcium oxalate absent.

Distribution : Europe. Closely allied substitutes of the drug are available in India and U.S.A.

History and authority : Mentioned in Homoeopathic literature in 1833 by Berridge, England. Allen's Encyclop. Mat. Med., Vol. IV, 332; X, 528. Hering's Guiding Symptoms, Vol. V, 326.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Filix Mas in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	797 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

GLONOINUM
(Glon.)

Chemcial formula : $C_3H_5N_3O_9$ **Mol. wt.**: 227.07

Common names : Glonoine, Nitroglycerin, Glyceryl Trinitrate.

Description : A colourless; odourless liquid with a sweet burning taste. Almost insoluble in water, readily soluble in alcohol. Explodes on concession or rapid heating. Begins to decompose at 50° to 60° appreciably volatile at 100°, evolves nitrous yellow vapours at 135° and explodes at 218°. Prepared by nitrating glycerin with a mixture of nitric acid and sulphuric acid, called nitration acid. Contains not less than 81.0 percent and not more than 121.0 percent of the labled amount of glyceryl trinitrate.

Assay : Mix an accurately weighed quantity of the substance equivalent to about 1 mg of glyceryl trinitrate with 5 ml of glacial acetic acid, shake continuously for 1 hour and filter. Mix 1 ml of the filtrate with 2 ml of phenol disulphonic acid, stir well and allow to stand for 15 minutes. Add 8 ml of water and make alkaline with strong solution of ammonia, cool to about 20°, dilute to 20 ml with water and filter, if necessary. Compare, under similar conditions in a suitable colorimeter, the colour of this solution with the colours of solutions containing known quantities of potassium nitrate, which have been treated in the same manner. Each g of potassium nitrate is equivalent to 0.7487 g of $C_3H_5N_3O_9$.

Storage : Keep in a well-closed container, protected from light and store in cool place.

History and authority : Proved by Hering in 1848, Hering's Guiding Symptoms, Vol. V, 407. Allen's Encyclopedia Mat. Med., Vol. IV, 425. A Dictionary of Practical Mat. Med., Clarke, Vol. I, 824.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Glonoinum 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

GOSSYPIUM HERBACEUM
(Gossy. h.)

Botanical name : *Gossypium herbaceum* Linn. **Family**: Malvaceae

Common names : *Hindi*: Kapas; *English*: Cotton plant; *German*: Baumwolle.

Description : An annual herb or undershrub, up to 1.5 m in height with herbaceous branches, sparsely hairy or rarely becoming glabrous. Leaves coriaceous, reticulate, strongly cordate, 5 to 7 lobes extending less than half the depth of blade, each lobe broad-ovate, short-acute, mostly narrowed at base, bracts rounded at the base and broadly triangular flaring widely from flower, mostly wider than long. Flowers yellow with purple centre. Fruit 10 to 18 mm long, rounded without prominent shoulders, beaked, 3 to 4 celled. Seeds large angled with grey, fuzz and greyish lint.

Part used : Inner bark of the root.

Macroscopical : In flexible bands or quilled pieces attaining a length up to 30 cm and thickness of about 1 mm, outer surface weak brown to moderately yellowish-brown, smooth or usually slightly longitudinally wrinkled with small circular lenticels, the cork and cortex frequently exfoliated and exposing the fibrous inner bark; inner surface light brown to pale yellowish-orange, striated longitudinally; fracture tough, fibrous, the inner bark separating readily into fibrous layers; odour indistinct; taste slightly acrid.

Microscopical : Cork: consists of 4 to 6 layers, large brick-shaped, yellowish-brown cells with thin walls. Cortex: several layers of parenchymatous cells containing mostly simple or 2 to 4 compound starch grains, the individual grains being more or less spheroidal, up to 20 µ in diameter, some cells contain tannin, others rosette crystals of calcium oxalate; a few secretion-reservoirs lined with epithelium containing colourless to yellowish-orange contents are also present. Phloem zone broad, consisting of large, conical phloem patches separated by large, wedge-shaped, primary medullary rays which broaden towards cortex; each phloem patch is traversed by phloem-rays; some phloem parenchymatous cells contain rosette aggregates of calcium oxalate, others starch grains.

Distribution : Asia, Europe and America.

History and authority : Mentioned in Homoeopathic literature in 1851, N.A.J. of Hom. I, 273. A short proving 1869 by W. Williamson U. S., Hahn. Month. IV, 315. Allen's Encyclop. Mat. Med., Vol. IV, 458; X, 538. Hering's Guiding Symptoms Vol. V, 435.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Gossypium Herbaceum in moderately *coarse powder*	100 g
Purified Water	600 ml
Strong Alcohol	437 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x — Drug strength 1/10

Gossypium Herbaceum in moderately *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I., 9x and higher with *Dispensing Alcohol.*

GUAIACUM
(Guaic.)

Description : It is the resin obtained from the wood of *Guaiacum officinale* Linn. and of *G. sanctum* Linn. which are native of tropical America. Rounded or ovoid tears, frequently covered with a dull green powder or large blocks, the latter being usual form. It breaks easily, with a clear, glassy fracture, thin pieces being transparent and exhibiting a colour varying from yellowish-green to reddish-brown; powder grey but becoming green on exposure to light and air; odour aromatic when warmed; taste slightly acrid. Readily, but not always completely soluble in alcohol. Obtained by extraction with alcohol or by heating the wood.

Identification : To 10 ml of a 1 percent solution in alcohol, add a few drops of ferric chloride test solution; a blue colour is produced.

Alcohol insoluble matter : Not more than 10 percent.

Ash : Not more than 2.5 percent.

Colophony : Shake 1 g of the resin in powder with 5 ml of light petroleum (b.p. 50° to 60°) for 5 minutes and filter; the filtrate is colourless; shake with an equal volume of dilute copper acetate solution; a green colour does not develop.

Storage : Store in well-closed containers, which prevent access of moisture and protected from light.

History and authority : Proved and introduced by Hahnemann. Fellow-provers were Hartmann, Langhammer, Teurthorn, Mentioned in Materia Medica Pura, Vol. I, 619. Allen's Encyclop. Mat. Med., Vol. IV, 515. A Dictionary of Practical Mat. Med., Clarke, Vol. I, 852.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Guaiacum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

ICHTHYOLUM
(Ichthyo.)

Common names : Ichthammol, Ammonium Ichtho sulphonate, Ammonium bithiolicum, Ichthosulphal.

Description : An almost black, viscid liquid; odour, strong and characteristic. Soluble in water, partly soluble in alcohol. It consists of the ammonium salts of the sulphonic acids of an oily substance prepared from a bituminous schist or shake together with ammonium sulphate and water. It contains not less than 10.5 percent w/w of organically combined sulphur, calculated with reference to the dried substance and not more than one fourth of the total sulphur in the form of sulphates.

Identification : (i) When warmed with an equal volume of sodium hydroxide solution, ammonia is evolved.

(ii) 1 g dissolves in 50 ml of water, forming a clear dark brown solution from which hydrochloric acid precipitates, a dark resinous mass.

Solubility in glycerol : 1 mg dissolves completely in 9 ml of glycerol and remains in solution for not less than twenty-four hours.

Loss on drying : When dried to constant weight at 105º, loses not more than 50.0 percent of its weight.

Sulphated ash : Not more than 0.3 percent.

Assay : (i) *For organically combined sulphur*: Mix in a porcelain crucible of about 50 ml capacity, about 0.5 g accurately weighed, with 4 g of anhydrous sodium carbonate and 3 ml of chloroform; warm and stir until all the chloroform has evaporated. Add 10 g of coarsely powdered copper nitrate, mix thoroughly and heat the mixture gently with a small flame. When the initial reaction has subsided, increase the temperature slightly until most of the material has blackened. Cool, place the crucible in a large beaker, add 20 ml of hydrochloric acid and when the reaction has ceased, add 100 ml of water and boil until all the copper oxide is dissolved. Filter the solution, dilute with 400 ml of water, heat to boiling and add 20 ml of barium chloride solution. Allow to stand for 2 hours, filter off the precipitate, wash with water, dry and ignite at a temperature of about 600º until, after further ignition, two successive weighing do not differ by more than 0.2 percent of the weight of the residue. Each g of residue is equivalent to 0.1374 g of S.

From the percentage of total sulphur thus obtained, substract the percentage of sulphur in the form of sulphates.

(ii) *For sulphur in the form of sulphates*: Dissolve about 2 g accurately weighed, in 100 ml of water, add 2 g of cupric chloride dissolved in 80 ml of *water* and sufficient *water* to produce 200 ml, shake well and filter. Heat 100 ml of the filtrate, representing half of the ichthammol being tested, nearly to boiling, add 1 ml of hydrochloric acid and 5 ml of barium chloride solution drop by drop and heat on a water-bath. Filter, wash the precipitate with water, dry and ignite at a temperature of about 600° until, after further ignition, two successive weighings do not differ by more than 0.2 percent of the weight of the residue. Each g of residue is equivalent to 0.1374 g of sulphur present in the form of sulphates.

History and authority : A Dictionary of Practical Materia Medica, Clarke Vol. II, 4. New, Old and Forgotten Remedies, Anshutz, 204.

Preparation : (a) Mother Solution — Drug strength 1/10

Ichthyolum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher up to 5x with Purified Water for immediate use only, 6x and higher with *Dispensing Alcohol*.

(c) Trituration 1x — Drug strength 1/10

Ichthyolum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

IRIS VERSICOLOR

(Iris. ver.)

Botanical name : *Iris versicolor* Linn. **Family**: Iridaceae

Common names : *English:* Blue flag, Flag lily, Poison flag, Liver lily, Snake lily, Water flg, Dragon flower; *French*: Glaieul bleu, Rhizome d' Iris varie; *German*: Amerikanischer Schwertlilie.

Description : Perennial herb, 20 to 80 cm high. Stem stout, angular on one side, equalling or slightly exceeding the leaves. Leaves erect, sword-shaped, glaucous, 7.5 to 10 cm wide, 30 to 46 cm long. Rhizome weak red to moderate to yellowish-brown, occasionally purplish-brown, horizontal, tuberous with 2 to 4 lateral branches, 20 cm long, 3 cm wide at nodes, wrinkled longitudinally, with annular markings, upper surface with stem and leaves bases, lower with long, slender rootlets. Flowers short pedicelled, arising from a spathe with 2 or more leaves or bracts, appear during May and June, 6 to 8 cm across, violet, blue-violet, purple, red-purple or rarely white. Calyx spreading, with greenish yellow blotch at the base, white variegations and purple veins on the remaining part; corolla erect, half to two-thirds as long as the sepals, claws pale-streaked. Fruits 3-celled, loculicidally dehiscent, sub-cylindrical capsules with obtuse angles, 3.5 to 5.5 cm long.

Part used : Rhizome.

Macroscopical : The drug occurs in pieces from 5 to 20 cm long and 1 to 2.5 cm thick, cylindrical in the older parts but mostly flattened dorsiventrally and divided by slight constrictions about 3 to 5 cm apart into more or less enlarged portions. Externally the rhizome is reddish-brown, wrinkled longitudinally and bears annular markings; the lower surface shows numerous root-scars or occasionally transversely wrinkled roots; the upper surface bears lead-scars. The fracture is short, colour from cream to purplish brown and exhibits pale fibro-vascular bundles, scattered throughout. Odour slight; taste pungent and acrid.

Distribution : Eastern and Central Northern America, Canada; grows in marshy grounds.

History and authority : First proved by J.C. Rowland in 1852. Also proved by Burt, Holcombe, Berridge, Croker, Wesselhoeft etc. Mentioned in Homoeopathic literature in 1851 by Kitchner, Philadelphia. Allen's Encyclop. Mat. Med., Vol. V, 153. Hering's Guiding Symptoms, Vol. VI. A Dict. of Pract. Mat. Med., Clarke, Vol. I.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Iris Versicolor in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

JABORANDI
(Jab.)

Botanical name : *Pilocarpus jaborandi* Holmes &
Pilocarpus microphyllus Stapf **Family**: Rutaceae

Common names : *English*: Pilocarpus; *German*: Jaborandiblatter; *French*: Jaborandi.

Description : A small, branched shrub, up to 2 m high having a smooth, grey bark, spotted with white dots. Leaves alternate, imparipinnate, 30 to 45 cm long having 3 pairs of leaflets and a terminal one, short stalked, leaflets coriaceous, green and shining above, paler or smooth or hairy beneath, with a prominent midrib and many minute pellucid glands; when crushed odoriferous. Flowers small, pinkish-purple and in racemes. Fruits consists of 5 follicles.

Part used : Leaves.

Macroscopical : Leaf: in transverse section shows upper epidermis of more or less tangentially elongated cells, with thick yellow outer cuticle and frequently showing long, yellowish, thick-walled, unicellular, non-glandular, bent or curved hairs; palisade parenchyma consisting of 1 to 3 layers of columnar cells mostly possessing chloroplasts, some rosette aggregates of calcium oxalate, scattered amongst these cells are large, more or less spheroidal, internal glands containing oil globules; spongy parenchyma a broad zone of irregularly shaped cells and prominent intercellular spaces, many cells containing a rosette aggregate of calcium oxalate, others reddish-brown tannin masses; lower epidermis of more or less tangentially elongated epidermal cells and stomatal apparatuses, the outer walls of cells being covered with thick yellow cuticle. The midrib region shows a partial circle of collateral bundles separated by narrow medullary rays and surrounded by an interrupted circle of several rows of thick-walled, slightly lignified, pericyclic fibres.

Distribution : Brazil; in open forests.

History and authority : Introduced into Homoeopathic practice at Paris in 1874 by Coutinho of Pernambuco. But the first systematic proving of this drug seems to have been done by W. L. Watkine, New York. Allen's Encyclop. Mat. Med., Vol. V, 165. Hering's Guiding Symptoms, Vol. VI. A Dictionary of Practical Mat. Med., Clarke, Vol. II.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Jaborandi in moderately *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x	Drug strength 1/10
Jaborandi in moderately *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

JALAPA
(Jal.)

Botanical name : *Exogonium purga* (Wenderoth) Benth. **Family**: Convolvulaceae

Synonyms : *Exogonium jalapa* Nutt, *Ipomoea purga* Hayne.

Common names : *English*: Jalap, Jala proot; *French*: Jalap tubercuse *German*: Jalapenknollen, Jalapenwurzel.

Description : Deciduous, perennial herb. Root tuberous, fusiform, sub-spherical, pear-shaped or irregularly oblong, fibrous and tapering below, 5 to 10 cm long and 2 to 10 cm broad. Stem several, twinning, slender, furrowed, purplish and 5 to 6 m long. Leaves alternate, long petioled, exstipulate, entire, cordate, thick, smooth, pale, veiny beneath and 10 to 13 cm long. Flowers purplish-pink in axillary cymes on long wiry and twisted peduncles. Fruit, septifragally dehiscent capsule.

Part used : Roots.

Macroscopical : Dusty brown to moderately yellow, longitudinally wrinkled or furrowed, with numerous paler, elongated transverse lenticels. Fracture tough, horny, waxy; pale brown or yellowish-grey or dingy grey internally, containing a distinct dark primary cambial line, several irregularly arranged curving tertiary-cambial lines, mottled wood containing numerous bundles and brown resin cells. Odour distinct, smoky; taste first sweetish afterwards disagreeably acrid.

Microscopical : Roots: cork cells thin-walled cork cells with brownish contents; phelloderm with sub-rectangular sclerenchymatous cells; cortex parenchymatous, narrow, with tangentially-elongated cells containing starch grains, crystals of calcium oxalate and secretory cells, 1.5 to 2 mm broad; secondary xylem parenchymatous and broad, containing simple, rounded or 2 to 4 compound starch grains with concentric hilum, cluster crystals of calcium oxalate 15 to 30 µ in diameter, tracheae scattered singly or in groups and several interrupted concentric zones of small bicollateral bundles developed from tertiary cambia.

Distribution : Mexico, Eastern slopes of the Mexican Andes, West Indies and Florida.

History and authority : Mentioned in Homoeopathic literature in 1843 by Noack and Trinks. Allen's Encyclop. Mat. Med., Vol. V. Hering's Guiding Symptoms, Vol. VI.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Jalapa in fine powder	100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x	Drug strength 1/10
Jalapa in fine powder	100 g
Saccharum lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

JUNIPERUS COMMUNIS

(Junip. c.)

Botanical name : *Juniperus communis* Linn. **Family**: Cupressaceae

Common names : *English*: Juniperi Fructus, Juniperi Berry; *Hindi*: Aaraar, Hanbera.

Description : A dense shrub, more or less procumbent. Leaves 5 to 13 mm long, in whorls of 3, linear, sharply pointed, spreading nearly at right angles from the branchlets, convex on the back, concave and glaucous, bluish-white on upper surface, jointed at the base and continued down the stem with a large gland on the decurrent portion. Cones unisexual axillary. Fruit 7.5 to 10 mm long, subglobose, fleshy, bluish-black, glaucous; seeds 1 to 3.

Part used : Ripe Berries.

Macroscopical : Fruit: sub-spherical, berry like, from about 0.5 to 1 cm in diameter, deep purplish-black, sometimes with a reddish tint and covered with a greyish, waxy bloom. The apex shows a triradiate mark and depression indicating the sutures of the 3 fleshy scales. At the base are 6, small, pointed bracts arranged in 2-whorls but occasionally 3 or 4 such whorls present. 3 ovate seeds are embedded in the fleshy scales each with a hard woody testa to which few large, oily-glands are attached. Odour aromatic, taste sweet, terebinthinate and bitterish.

Distribution : North-West Himalayas.

History and authority : Materia Medica with Repertory, Boericke, 360. American Homoeopathic Pharmacopoeia.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Juniperus Communis, moist magma containing solids 100 g and plant moisture approximately 150 ml	250 g
Strong Alcohol in sufficient quantity	867 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

KALI BROMATUM

(Kali. br.)

Chemical Formula : KBr **Mol. wt.**: 119.02

Common names : Potassii Bromidum, Potassium Bromide; *French*: Bromure de potassium; *German*: Kaliumbromid.

Description : Colourless, transparent or opaque crystals or a white granular powder; odourless; taste, saline and faintly bitter. Soluble in 1.5 parts of water, in 250 parts of alcohol (90 percent). Contains not less than 98.5 percent of KBr calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields reactions characteristic of potassium and of bromides.

Loss on drying : Looses not more than 1.0 percent of its weight when dried to constant weight at 105°.

Test for chloride : Maximum 0.20 percent.

Assay : Weigh accurately about 0.4 g of dried salt and dissolve in 40 ml of water and 5 ml of nitric acid. Add 50 ml of 0.1 N silver nitrate and 5 ml of nitrobenzene and shake. Titrate with 0.1 N ammonium thiocyanate using solution of ferric ammonium sulphate as indicator and shaking vigurously as the end point is approached. Correct for the amount of chloride present as determined by the test for chloride. Each ml of 0.1 N silver nitrate is equivalent to 0.0119 g of KBr.

History and authority : Allen's Encyclop. Mat. Med., Vol. V, 264; X. Hering's Guiding Symptoms, Vol. VI.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Bromatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution (to be freshly prepared) — Drug strength 1/10

Kali Bromatum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x with *Dilute Alcohol*, 3x and higher with *Dispensing Alcohol.*

KALI CYANATUM
(Kali. cy.)

Chemical Formula : KCN **Mol. wt.**: 65.12

Common names : Potassii cyanidum, Kalium cyanatum, Potassium cyanide; *French*: Cyanure de potassium; *German*: Kaliumcyanid.

Description : White, deliquescent granular powder or fused pieces. Odourless, when dry but otherwise odour of HCN gas. Deadly poison. Gradually decomposes on exposure to air. Soluble in 2 parts of cold and 1 part of boiling water. Contains not less than 95.0 percent of KCN.

Identification : (i) The aqueous solution is strongly alkaline and rapidely decomposes.

(ii) With solution of silver nitrate a white precipitate is formed, which is insoluble in excess of KCN and ammonium hydroxide.

(iii) With ferrous sulphate in excess of hydrochloric acid, a blue precipitate is formed.

Heavy metals : To 20 ml of 5.0 percent solution add 10 ml of hydrogen sulphide solution, no darkening is produced immediately or on addition of 5 ml of dilute hydrochloric acid.

Assay : Dissolve about 0.5 g accurately weighed in 50 ml of water, add 5 ml of dilute ammonia solution and 1 drop of potassium iodide solution; titrate with 0.1 N silver nitrate until a faint permanent turbidity appears. Each ml of 0.1 N silver nitrate is equivalent to 0.01302 g of KCN.

History and authority : First proved by Lembke, Germany. Allen's Encyclop. Mat. Med., Vol. V. Hering's Guiding Symptoms, Vol. II. A Dictionary of Pract. Mat. Med., Clarke, Vol. I.

Preparation : (a) Trituration 2x — Drug strength 1/100

Kali Cyanatum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol*.

Caution : Keep in tightly closed container protected from light, moisture and acid fumes. Deadly Poison. Not to be prescribed below 6x.

LITHIUM CARBONICUM
(Lith. carb.)

Chemical Formula : Li_2CO_3 **Mol. wt.**: 73.89

Common names : Lithii carbonas, carbonate of lithium, Lithic carbonate; French: Carbonate de lithine; *German*: Lithium-carbonat.

Description : White minutely crystalline or amorphous powder, odourless; taste, slightly alkaline. Soluble in nearly 80 parts of water, slightly soluble in boiling water, insoluble in alcohol; soluble in dilute acids. Contains not less than 98.5 percent of Li_2CO_3 calculated with reference to the substance dried at 100°.

Identification : (i) Dissolve about 0.2 g in 5 ml of HCI, boil, add 2 ml of sodium hydroxide solution and 5 ml of sodium phosphate solution and boil; a white precipitate is produced.

(ii) When introduced into a bunsen flame on a platinum wire previously moistened with hydrochloric acid, carmine-red colour is produced.

(iii) Yield the reactions characteristic of carbonates.

Loss on drying : When dried to constant weight at 100°, looses not more than 1.0 percent of its weight.

Assay : Dissolve about 1.0 g, accurately weighed in 50 ml of 1 N sulphuric acid and boil gently to expel carbon dioxide. Cool and then titrate the excess acid with 1 N sodium hydroxide using methyl-orange solution as indicator. Each ml of 1 N sulphuric acid is equivalent to 0.03695 g of Li_2CO_3.

History and authority : Proved and introduced into Homoeopathic Materia Medica by Hering. Allen's Encyclop. Mat. Med., Vol. V. Hering's Guiding Symptoms, Vol. VII, 68. A Dictionary of Pract. Mat. Med., Clarke, Vol. II.

Preparation : (a) Trituration 1x

	Drug strength1/10
Lithium Carbonicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

LOBELIA INFLATA
(Lob. in.)

Botanical name : *Lobelia inflata* Linn. **Family**: Lobeliaceae

Common names : *English*: Indian tobacco, Wild tobacco, Bladder podded lobelia, Asthma or Emetic weed, Eye bright; *French*: Herbe de lobelie enflee; *German*: Lobelienkraut.

Description : An annual or biennial herb, up to 60 cm in height. Stem yellowish-green, pubescent, branched. Leaves alternate, ovate or oblong with serrate denticulate margin, the lower short petioled, the upper sessile. Inflorescence is a terminal raceme of small pale blue, short pedicelled flowers. Fruit a bladdery, ovoid or ellipsoidal, 2-celled capsule containing numerous small oblong coarsely reticulate, brown seeds.

Part used : Whole plant excluding roots.

Macroscopical : Stem cylindrical, winged, coarsely and irregularly furrowed, yellowish-green, occasionally purplish with numerous hairs. Leaves alternate, sessile or short petioled, usually somewhat broken; when entire, laminae pale olive to dusky yellowish-green, pubescent with scattered bristly hairs, ovate or oblong, from 2 to 9 cm in length, obtusely dentate or irregularly serrate-denticulate, each tooth with a yellowish-brown, glandular apex; flowers pale blue, in elongated loose racemes; calyx tube ovoid, with 5-subulate teeth, corolla tubular, from 3 to 4 mm in length, 5-parted, the upper 2-lobed portion cleft nearly to the base; stamens with anthers united above into a curved tube enclosing the bifid stigma; capsule bladdery, ovoid or ellipsoidal from 5 to 8 mm in length, light brown, inferior and enclosing numerous brown, oblong and coarsely reticulate seeds; odour slight; taste strongly acrid and tobacco-like.

Microscopical : Upper internodes of stem have 6 rounded angles, 2 to 5 which may carry winged outgrowth of cortex. The epidermis consists of axially elongated cells, bearing trichomes similar to those of leaves and has stomata, oriented parallel to the axis. Cortex with rounded parenchyma; endodermis well marked consisting of large cells with an obvious casparian strip. Phloem contains a cylindrical network of laticiferous vessels. Pith large formed of lignified thin-walled parenchyma with simple pits.

Leaves: dorsiventral, having a single layered palisade of wide, cylindrical cells. Upper epidermis, papillose with many nearly straight, beaded anticlinal walls covered by striated cuticle, stomata absent, each tooth with 8 to 12 water pores. Lower epidermis having numerous stomata. Laticiferous tissue well developed in phloem of meristele in midrib. Trichomes scanty on upper surface but more numerous on lower. Seeds have characteristic epidermis

of elongated polygonal, tabular cells, with lignified and thickened anticlinal walls.

Distribution : United States and Canada.

History and authority : Introduced into Homoeopathic Materia Medica by Jeanes, U.S. Allen's Encyclop. Mat. Med., Vol. V. Hering's Guiding Symptoms, Vol. VII.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Lobelia Inflata in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

MAGNESIUM PHOSPHORICUM

(Mag. phos.)

Chemical Formula : $MgHPO_4.7H_2O$ **Mol. wt.**: 174.34

Common names : Magnesii phosphas, Magnesia phosphorica, Magnesium phosphate (Diabasic), Magnesium hydrogen phosphate, Secondary magnesium phosphate; *French*: Phosphate de megnesic; *German*: Magnesium hydrogen phosphate.

Description : A white crystalline powder, slightly soluble in water, insoluble in alcohol; readily soluble in dilute acids. Prepared by dissolving two parts of sulphate of magnesia in thirty-two parts of distilled water and mixing with a solution of three parts of phosphate of soda in thirty-two parts of distilled water and setting aside to crystallise. The salt separates in the course of twenty-four hours in tufts of prisms or needles.

Identification : Yields reactions characteristic of magnesium and of phosphates.

History and authority : Fine proving in potencies by H. C. Allen (Med. Adv. XXXIII). A Dictionary of Practical Materia Medica, Clarke, Vol. II.

Preparation : (a) Trituration 1x Drug strength 1/10

Magnesium Phosphoricum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

MAGNESIA SULPHURICA
(Mag. sul.)

Chemical Formula : $MgSO_4.7H_2O$ **Mol. wt.**: 246.3

Common names : Magnesii sulphas, Magnesium sulphate, Epsom salt; *French*: Sulfate de magnesie; *German*: Magnesiumsulfat.

Description : Colourless, crystals, usually needle like, taste saline and bitter. Effloresces in warm dry air. Soluble in 1 part of *water*, sparingly soluble in alcohol. Contains not less than 99.5 percent and not more than the equivalent of 100.5 percent of $MgSO_4$ calculated with reference to the substance dried to constant weight at 300°.

Identification : Yields the reactions characteristic of magnesium and of sulphates.

Reaction : 1 g dissolved in 10 ml of *water* is neutral to solution of litmus.

Loss on drying : Loses not less than 48 percent and not more than 52 percent of its weight when dried to constant weight at 300°.

Assay : Dissolve about 0.4 g, accurately weighed, in 50 ml of *water*, add 10 ml of strong *ammonia-ammonium chloride* solution and titrate with 0.05 M *disodium edetate* using 0.1 g of *mordant black* mixture as indicator, until the pink tint is discharged to the blue. Each ml of 0.05 M *disodium edetate* is equivalent to 0.006019 g of $MgSO_4$.

History and authority : Proved by Nenning, Hartlaub and Trinks in Germany. Allen's Encyclop. Mat. Med., Vol. VI. Hering's Guiding Symptoms, Vol. VII. A Dictionary of Pract. Mat. Med., Clarke, Vol. II.

Preparation : (a) Trituration 1x — Drug strength 1/10

Magnesia Sulphurica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution — Drug Strength 1/10

Magnesia Sulphurica	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x and higher up to 5x to be freshly prepared for immediate use only with Purified Water, 6x and higher with *Dispensing Alcohol.*

Storage : All preparations in Purified Water be freshly prepared. Preserve in a well closed container.

MANGANUM ACETICUM

(Mng. acet.)

Chemical Formula : $Mn(CH_3.COO)_2.4H_2O$ **Mol. wt.**: 245.08

Common names : Manganous acetate, Manganesii acetas; *French*: Acetate de manganese; *German*: Essigsaurer Braunstein, Manganazetat.

Description : Pale red, transparent crystals; odourless. Soluble in water and in alcohol. Prepared from manganese dioxide. Contains not less than 99 percent of $MnC_4O_4H_6.4H_2O$.

Specific gravity : 1.5 to 1.59.

Identification : Yields the reactions characteristic of *manganese* and *acetates*.

Assay : Dissolve about 0.8 g accurately weighed in 100 ml of *water*, add few crystals of *ascorbic acid* and 50 ml of 0.1 M Titriplex III solution. Add 10 ml of *ammonia-ammonium chloride buffer* solution and 2 ml of *ammonia* solution (25 percent). The excess titriplex III is back titrated against 0.1 M *zinc sulphate* solution, till the colour changes from green to red. Each ml of 0.1 M Titriplex III is equivalent to 0.02450 g of $Mn(CH_3COO)_2.4H_2O$.

History and authority : Hahnemann proved and introduced it, mentioned in Materia Medica Pura, Vol. II. Allen's Encyclopedia Materia Medica, Vol. VI. A Dictionary of Practical Materia Medica, Clarke, Vol. VI. Hering's Guiding Symptoms, Vol. VII.

Preparation : (a) Trituration 1x — Drug strength 1/10

Manganum Aceticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution — Drug strength 1/10

Manganum Aceticum	100 g
Purified water in sufficient quantity	

to make one thousand millilitres of the Solution.

(d) Potencies: 3x and higher with *Dispensing Alcohol*.

Caution : Potencies below 3x should be prepared fresh.

MELILOTUS ALBA
(Mel. alb.)

Botanical name : *Melilotus alba* Desr. **Family**: Leguminosae (Fabaceae)

Common names : *Hindi*: Khandai, Banmethi; *English*: White melilotus, Sweet scented clover.

Description : An annual or biennial, erect or decumbent, pubescent or glabrous herb, up to 90 cm high. Leaves petioled, trifoliate; leaflets ovate, oblong or obovate, 1.3 to 2.5 cm, upper part toothed, base entire lateral leaflets nearly sessile, terminal stalked, veins parallel, extending into small sharp teeth; stipules narrowly lanceolate, long pointed, adhering with leaves-stalk. Flowers white, 5 mm long, in long axillary racemes, appear from July to September. Calyx bell-shaped; teeth 5, distinct, lanceolate, nearly equal, acute; style glabrous, incurved; stigma minute. Pods ovoid indehiscent, tipped with persistent style, brown when ripe; seeds 1 or 2.

Part used : Flowering tops.

Macroscopical : Drug contains pieces of stem, ovate or serrate leaflets, petioles with adhering stipules, bell-shaped calyx, whitish corolla, curved styles. Odour sweet and characteristic.

Microscopical : Leaf: epidermis with cuticular projections, upper epidermal cells with less sinuous anticlinal walls than lower ones, lower epidermal cells papillose, stomata ranunculacecus, trichomes glandular, shaggy with spherical head and multiseriate stalk; mesophyll with sclerenchymatous, idioblasts in the central region; vascular bundles embedded in mesophyll. Petiole with sessile glands.

Stem: circular in outline, epidermis 1-layered; cortex parenchymatous with collenchymatous hypodermis; pericycle in sclerenchymatous patches; endodermis 1-layered and wavy; vascular bundles conjoint, collateral, open and in a ring. Pith large.

Distribution : India, especially in North up to 4000 m altitude; Europe, Mexico and the United States.

History and authority : Proved by G. W. Bowen, U. S., in 1851 and 1866. Allen's Encyclop. Mat. Med., Vol. VI. Hering's Guiding Symptoms Vol. VII. A Dict. of Pract. Mat. Med., Clarke, Vol. II.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Melilotus Alba, *moist magma* containing solids 100 g and plant moisture approx. 300 ml	400 g
Purified Water	200 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

MENTHA PIPERITA

(Men. pip.)

Botanical name : *Mentha piperita* Linn. **Family**: Lamiaceae

Synonyms : *Mentha hircine* Hull, *M. officinalis* Hull.

Common names : *English*: Peppermint; *French*: Menthe poivree; *German*: Pfefferminze.

Description : A perennial herb, with creeping, spreading rhizome multiplying by under-ground shoot. Stem erect, always quadrangular in upper part, smooth, 1 to 3 mm in diameter, green to dark purple, hairy and 30 to 90 cm high. Leaves, light green or purple-brown, opposite, decussate, 4 to 15 cm long, 2.5 cm broad, nearly glabrous, shortly petiolate, petiole being 0.5 to 1.0 cm long, ovate-oblong to oblong-lanceolate, margins serrate, apex acute, base rounded or narrow, dark green and smooth above, paler below, with numerous glands sparingly pubescent on nerves. Flowers, purple, small in verticillasters usually arranged in compact, oblong or oval terminal spikes which are often interrupted at base and rounded at the summit, appearing in summer. Calyx, tubular-campanulate, green to dark purple, equally 5-toothed pubescent and glandular. Corolla, tubular-canpanulate, 4-cleft, purple, irregular. Stamen, 4, short, equal. Gyncecium, 4 celled, ovary and a projecting style ending in a bifid stigma. Fruit consisting of 4-ellipsoidal nutlets, which are blackish-brown, 500 µ in diameter. Odour strong and aromatic, taste aromatic followed by cooling and pungent sensation.

Part used : Whole plant, excluding root.

Microscopical : Leaf: dorsiventral with a single row of palisade cells, about 60 to 80 µ long; spongy parenchyma, 3 to 4 layered; upper and lower epidermal cells with wavy anticlinal walls, stomata being numerous on lower epidermis and a few on the upper, two types of glandular trichomes and a type of non-glandular trichome on margins and veins; glandular trichomes being abundant on the under surface. Large glandular trichomes, sunk in depression are with unicellular stalk and glandular head composed of 8-radiating cells forming a hollow cup, volatile oil being secreted beneath the cuticle of the 8 cells, raising the delicate cuticle to form a nearly spherical bladder. Small glandular trichomes consisting of a single stalk cell and unicellular glandular head, about 20 to 25 µ in diameter. Non-glandular trichomes, uniseriate, 3 to 4 to 8 cells long, tapering to a pointed apex and having longitudinally striated cuticle. Crystals of calcium oxalate absent. Stomata, carycphllaceous. Midrib, in transection showing xylem in the form of an arc and phloem on the dorsal side. Leaf, upper epidermal cells; T. 23-35µ. R. 18-23µ, L. 40-50-70µ; lower epidermal cells; T. 15-25µ. R. 10-15µ, L. 30-40-60µ; palisade cells: 23-46µ x 15-20µ.

Distribution : India, Europe, Africa, North America and Japan.

History and authority : Proved and introduced into Homoeopathic Mat. Med. by Demeures, J. d. l. Soc. Gal. IV. Allen's Encyclop. Mat. Med., Vol. VI, X.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Mentha Piperita, *moist magma* a containing solid 100 g and moisture 400 ml	500 g
Strong Alcohol	632 ml

to make on thousand millilitres to the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

MENYANTHES TRIFOLIATA

(Menyan. t.)

Botanical name : *Menyanthes trifoliata* Linn. **Family**: Gentianaceae

Common names : *English*: Bitter worm, Bog bean, Brook bean, Buck bean; *French*: Trefle d' can (de marais); *German*: Fieberiklee, Dreiblatt.

Description : A perennial herb, with a thick horizontal rhizome. Leaves alternate, trifoliate, each with 3 obovate leaflets, arising from rhizome on long, broad, flattened and striated petiole, 16 cm in length with broad, sheathing stipules at the base. Leaflets ash-green, glabrous, somewhat fleshy, obtuse or acute at apex, margin entire or coarsely undulate, base cuneate, 3 to 8 cm long, prominent midrib. Flowers white or pink, in 7.5 cm long conical raceme on stout, glabrous pedicels. Calyx, 5-celft, calyx-lobes somewhat re-curved and ovate. Corolla pink outside, pale or white within, about 15 mm across, funnel-shaped and much fimbriate on its upper surface. Stamens 5. Bicarpellary pistil with slender style and 2-lobed stigma. Fruit, many seeded, unilocular capsule.

Part used : Whole plant.

Microscopical : Leaf: trichomes uniseriate and mucilaginous; stomata on both the epidermis, ranunculaceous; hydathodes present at leaf margins, situated at enlarged terminations of veins.

Petiole: vascular bundles widely spaced and arranged in a ring. Pedicel, with cortex containing numerous vertically elongated air-cavities, vascular bundles widely spaced and unconnected by inter fascicular cambium; vessels thick-walled with scalariform lateral pitting; scalariform plates may occur; pith very lacunar. Rhizome with scattered vascular bundles surrounded on both sides by strands of fibres.

Distribution : Europe, Asia and North America.

History and authority : Introduced into Homoeopathic practice in 1826 by Hahnemann. Allen's Encyclop. Mat. Med. Med., Vol. VI. Hering's Guiding Symptoms, Vol. VII.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Menyanthes Trifoliata in most magma containing	
solds 100g and plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

MORPHINUM MURIATICUM

(Morph. m.)

Chemical Formula : $C_{17}H_{19}NO_3HCl.\ 3H_2O$ **Mol wt.**: 375.80

Common names : Morphine Hydrochloride, Muriate of Morphia; *French*: Chlorhydrate de morphine; *German*: Salzsaures Morphin.

Description : Colourless, glistening needless or a white, crystalline powder; odourless; taste, bitter. *Hydrochloride* of an *alkaloid*, *morphine*, obtained from opium. Soluble in *water* and *alcohol*. It contains not less than 98 percent of $C_{17}H_{19}NO_3HCI$, calculated with reference to the substance dried at 130°.

Identification : (i) Sprinkle a little of the powdered solid on the surface of a drop of *nitric acid*; an orange-red colour is produced.

(ii) Add a little of the powdered solid to 1 ml of *sulphuric acid* containing 1 drop of *formaldehyde* solution; a purple colour is produced.

(iii) To 20 mg, dissolved in 5 ml of 0.1 N *sulphuric acid*, add 0.5 ml, of a saturated solution of *potassium iodate*; an amber colour is produced, which reaches a maximum in about five minutes, on the addition of 0.5 ml of strong *ammonia* solution, the colour darkens almost to black (distinction from *codeine* and *diamorphine*).

(iv) Yields the reations characteristic of *chlorides*.

Acidity : Dissolve 0.2 g in 10 ml of freshly boiled and cooled *water* titrate with 0.02 N *sodium hydroxide* using *methyl red* solution as indicator, not more than 0.2 ml of 0.02 N *sodium hydroxide* is required.

Specific rotation : When determined in a 2 percent w/v solution and calculated on the anhydrous basis, should not be less than 112° and not more than 115°.

Loss on drying : When dried to constant weight at 130°, loses not less than 11.5 percent and not more than 14.5 percent of its weight. The dried material is not more than faintly yellow in colour.

Sulphated ash : Not more than 0.1 percent.

Other alkaloids : Wash the *chloroform* solution reserved from the first extraction in the assay with 2 successive quantities, each of 5 ml of *water*, evaporate to dryness on a water bath and dry the residue, to constant weight at 105°, the residue weighs not more than 1.5 percent, calculated with reference to the dried substance.

Assay : Transfer about 0.5 g accurately weighed, to a separator, add 15 ml of *water*, 5 ml of 0.1 N *sodium hydroxide* , 10 ml of *chloroform* shake , allow to separate and transfer the *chloroform* solution to another separator. Repeat the extraction with two further quantities, each of 10 ml of *chloroform*. Wash the mixed *chloroform* solution with 10 ml of 0.1 N *sodium hydroxide*, reserve the *chloroform* solution for the test for *other alkaloids* and add the alkaline solution to the first alkaline liquid. Add 20 ml of *alcohol* (50 percent), 40 ml of a mixture of three volumes of *chloroform* , 1 volume of *alcohol* (90 percent) and 1 g of *ammonium sulphate*. Shake well, allow to separate and reserve the *chloroform* solution. Repeat the extraction with successive quantities of 30, 20, 20 and 20 ml of the *chloroform-alcohol* mixture. Wash each *chloroform* solutions successively with the same two quantities, each of 5 ml of *water* avoiding vigorous shaking. Filter the *chloroform* solutions through, a plug of cotton wool previously moistened with *chloroform*, remove the solvent, add 20 ml of 0.1 N *hydrochloric acid*, boil, cool and titrate the excess of acid with 0.1 N *sodium hydroxide*, using *methyl red* as indicator. Each ml of 0.1 N *hydrochloric acid* is equivalent to 0.03218 g of $C_{17}H_{19}NO_3HCl$.

Storage : Store in a well-closed container, protected from light.

History and authority : Allen's Encyclopedia Materia Medica, Vol. VI, X, 585. Hering's Guiding Symptoms Vol. VII. A Dictionary of Practical Materia Medica, Clarke, Vol. II.

Preparation : (a) Trituration 1x

	Drug strength1/10
Morphinum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

MOSCHUS
(Mosc.)

Zoological name : *Moschus moschiferous* Linn. **Family**: Cervidae

Common names : *Hindi*: Kasturi; *English*: Musk, Tonquin musk, Yunan musk.

Description : Musk-sacs circular or slightly oval, blackish or reddish-brown, 4 to 7 cm in diameter, 1.5 to 3 cm in thickness, about 30 g in weight, enclosing grain musk; upper surface smooth, flatter than the side bearing the orifice; orifice depressed bearing greyish or brownish radiating bristles, margins covered by outer-skin extending 2 cm round or possessing two protuberances in vicinity; the inner-skin blue and glistening.

Part used : Pure Grain Musk (Dried secretion from the preputial follicle of the *Muschus moschiferous* Linn.

Macroscopical : Grain-musk contains reddish-brown, greyish or black, irregular, oily and glistening granules, up to 2 mm thickness; odour characteristic, penetrating, persistent; taste bitter; leaves whitish oily substance around granules when mixed with chloroform and evaporated.

Distribution : Kashmir, Assam, Nepal, Sikkim, Tibet and Siberia.

History and authority : Proved by Hahnemann, Gross and Stapf. Materia Medica Pura, Vol. I. Allen's Encyclop. Mat. Med. Med., Vol. VI. Hering's Guiding Symptoms, Vol. II. A Dictionary of Pract. Mat. Med.; Clarke, Vol. II.

Preparation : (a) Trituration 1x — Drug strength 1/10

Moschus	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies; 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

(c) Mother Tincture ϕ — Drug strength 1/20

Moschus	50 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

First add a small quantity of Purified Water to the pure musk. Rub in a mortar until a smooth mixture is obtained. Add the remainder of the Purified Water and *Strong Alcohol*. Macerate the Mother Tincture according to the method, described at Vol. I, H.P.I.

(d) Potencies: 2x to contain two parts Mother Tincture, four parts Purified Water and four parts *Strong Alcohol*; 3x and higher *Dispensing Alcohol.*

NAJA TRIPUDIANS

(Najat.)

Zoological name : *Naja tripudians* **Family**: Colubrinae

Common names : Cobra, Cobra de Capello; *English*: Hooded snake, Adder of the hood, Spectacled snake; *French*: Serpent a lunette; *German*: Brillensohlange.

Description : The head is slightly distinct from the neck. Each nostril lies between 2 nasals and the internosal. The pupil is round. The neck region can be expanded into a hood as the ribs of the region spread and move headword. A black and white speckled mark on the dorsal side. The tail is cylindrical, the pair of large grooved poison-fangs are separated by the interspace having from 1 to 3 small faintly grooved teeth near the posterior end of the maxillaries. The scales are smooth and without pits and are arranged into 15 to 25 oblique rows on the trunk, though more occur in the region of the neck.

Macroscopical : Cobra venom is amber coloured, viscous and frothy and contains proteids belonging to the peptones. Reaction acid, specific gravity, from 1.046 to 1.095. That portion of the venom soluble in s*trong alcohol* is extremely poisonous while the aluminous precipitate obtained is only slightly so. A yellow acrid pungent powder is left on evaporation. Brief exposure to strong acid does not affect the toxicity of this poison.

Distribution : Indian, widely distributed and ascend to 2,500 m above sea level in the Himalayas.

Part used : The venom, procured by compressing the gland while the serpent is either pinioned in a frame or under the influence of chloroform.

History and authority : First proved by Stokes & Russell, England, who made the proving along with some forty provers, Br. Journ. of Hom. 11, 25, 1853. Allen's Encyclop. Mat. Med., Vol. VI. A Dictionary of Practical Materia Medica, Clarke, Vol. II. Hering's Guiding Symptoms, Vol. VII.

Preparation : (a) Mother Solution ϕ Drug strength 1/100

Naja Tripudians 10 g

Glycerin in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x and higher upto 5x with Glycerin. 6x and higher with *Dispensing Alcohol*.

(c) Trituration: 2x and higher in accordance with the method Vol I, H.P.I., Vol. I, H.P.I.

Caution : Not to be prescribed below 6x.

NATRUM SALICYLICUM
(Nat. sal.)

Chemical Formula : $C_6H_4(OH)$, COONa **Mol. wt.**: 160.10

Common names : Sodium Salicylate; *French*: Salicylate de Soude; *German*: Natrium Salicylat.

Description : Colourless small crystals or crystalline flakes or a white crystalline powder; odourless or with a faint characteristic odour; taste sweetish saline and unpleasant. Soluble in 1 part of water; concentrated solutions are liable to deposit crystals of the hexahydrate, $C_7H_5Na.6H_2O$. Soluble in 10 parts of alcohol. This may be prepared from *salicyclic acid* and *sodium carbonate.* It contains not less than 99.5 percent of $C_7H_5O_3Na$ calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) Yields the reactions characteristic of *sodium.*

(ii) To 5 ml of a 0.1 percent w/v solution add one drop of *ferric chloride* solution, an intense reddish-violet colour produced. The colour remains on the addition of little *acetic acid* but disappears on the addition of dilute *hydrochloric acid,* with separation of a white crystalline precipitate of *salicylic acid*.

(iii) To 5 ml of a 5 percent w/v solution add 1 ml of dilute *sulphuric acid* a white precipitate produced which after being washed with *water* and dried, has a melting point of about 155°.

Loss on drying : Loses not more than 1.0 percent of its weight when dried to constant weight at 105°.

Assay : Dissolve about 3 g accurately weighed, in 50 ml of *water*. Add 50 ml of solvent *ether* and a few drops of *bromophenol blue* solution and titrate with 0.5 N *hydrochloric acid,* with constant shaking until the colour of the indicator begins to change; separate the lower layer, wash the ethereal layer with 10 ml of *water* and to the aqueous layer add the washings and a further 20 ml of solvent *ether*; complete the titration with the 0.5 N *hydrochloric acid* equivalent to 0.08005 g of $C_7H_5O_3Na$.

History and authority : Allen's Encyclop. Mat. Med, Vol. VI, A Dictionary of Pract. Mat. Med., Clarke, Vol. II.

Preparation : (a) Trituration 1x Drug strength 1/10

Natrum Salicylicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

OLEUM SANTALI

(Ol. santal.)

Common names : Oil of sandal wood, Oil of santal; *Hindi*: Chandan; *French*: Essence de santal; *German*: Santelol.

Synonym : Sandal wood oil.

Description : A pale yellow, somewhat viscid liquid; characteristic sandal wood odour, taste unpleasant, persistent and nauseous. Very slightly soluble in *water*; soluble in 5 volumes of 70 percent *alcohol*. It becomes less soluble in alcohol under the action of air and light. Obtained by distillation from the heart wood of *Santalum album* Linn. (Fam**.** Santalaceae). Contains Santalol, a mixture of two isomeric *sesquiterpene alcohols* of the formula $C_{15}H_{24}O$, which is present to the extent of over 90 percent and esters of Santalol.

Content of esters : Not less than 2 percent w/w calculated as santalyl acetate, $C_{17}H_{26}O_2$.

Optical rotation : 15° to 20°

Specific gravity : 0.965 to 0.980.

Refractive index : 1.505 to 1.510.

Assay : Determine by the methods of determination of esters and free alcohols in volatile oils,

Storage : Keep well-closed, cool and protected from light.

History and authority : Mentioned in Materia Medica, Therapeutics and Pharmacology, A. L. Blackwood, 479. Materia Medica with Repertory, Boericke, 483.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Oleum Santali	100 g
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with D*ispensing Alcohol*.

(c) Trituration 2x — Drug strength 1/100

Oleum Santali	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(d) Potencies: 3x and higher to be triturated in accordance with the method, Vol.I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with D*ispensing Alcohol.*

PASSIFLORA INCARNATA

(Passi. in.)

Botanical name : *Passiflora incarnata* Linn. **Family**: Passifloraceae

Common names : *English*: Maypop, Rose coloured Passion flower, White Passion flower.

Description : A perennial twining herb. Leaves, petiolate, alternate 3 to 5 lobed, margins serrate, base cordate, apex acute, glands on the under surface; stipules present. Petioles up to 5 cm long with 2 nectar-glands near the summit. Tendrils, numerous and closely coiled. Flowers large, solitary, on jointed, axillary peduncles, 5 cm broad, whitish, with a triple purple and flesh-coloured coronat. Calyx, 5-lobed and cup-shaped; corolla springing from throat of the calyx, with one or more rows of fine threads springing from calyx tube and one or more membranous folds arising lower-down; gynophore, surrounded at base by a shallow membranous cup; stamens-5, monoadelphous, anthers oblong, 2-celled, dorsi-fixed; pollen grains reticulate on the surface; ovary, unilocular; style-3, stigmas reniform capitate. Flowers appear from May to June. Fruit abeccate, externally green or yellow, somewhat shrivelled. Odour slight; taste slightly acrid.

Parts used : Leaves.

Microscopical : Leaf isobilateral, palisade 1 to 2 layered. Epidermis with projections. Lower epidermis frequently papillose. Upper epidermis with cells having less sinuous anticlinal walls than the lower epidermis. Stomata ranunculaceous. Trichomes, glandular and shaggy, with a spherical head on a multiseriate stalk. Sclerenchymatous idioblasts present in the central part of mesophyll. Veins, vascular bundles embedded in mesophyll. Petiole, with sessile glands.

Distribution : U.S.A.

History and authority : Introduced into Homoeopathic practice by Hale in 1875, Hale's New Rem. 4th Ed., 483. New, Old and Forgotten Remedies, Anshutz., 317.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Passiflora Incarnata in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with D*ispensing Alcohol.*

PHYSOSTIGMA VENENOSUM

(Physo. v.)

Botanical name : *Physostigma venenosum* Balfour.

Family: Leguminosae (Fabaceae)

Common names : *English*: Calabar bean, Chopnut, Ordeal bean; *French*: Feve de Calabar; *German:* Kalabarbonne.

Description : A perennial, woody climber, stem woody, up to 16 m in height, cylindrical, smooth and slender. Leaves large, alternate, pinnately-trifoliate, petiolate, thickened at base. Inflorescence is a pendulous axillary raceme of paplionaceous flowers. Fruit is compressed, brownish, reticulated legume, up to 18 cm long containing 2 or 3 reniform or oblong, brownish seeds.

Part used : Seeds.

Macroscopical : The seeds are entire, oblong, ellipsoidal, more or less reniform, anatropous, from 16 to 30 mm long and from 10 to 15 mm in thickness; externally reddish or chocolate brown, smooth except near the groove, where it is somewhat wrinkled. The hilum occurs as deep groove, about 2 mm broad and extending nearly the whole length of the convex edge and in which are sometimes found the remains of a white funicules; margins of the hard spermoderm on both sides of the groove yellowish-red or brownish-red and somewhat elevated embryo with two large, white plano-convex cotyledons and a small hypocotyl; odour indistinct; taste starchy.

Microscopical : Powdered drug greyish-white, with more or less ellipsoidal to reniform starch grains usually with a distinct hilum and often with radiating or irregular fissures, the grains being from 5 to 150 μ in diameter or length, fragments of thick-walled, nonlignified, brownish palisade cells with brownish contents and irregular, porous and colourless cells containing a red coloured substance from the hard seed coat; fragments of large, polygonal, thin-walled cells of the cotyledons containing starch and fixed oil; reticulate tracheae.

Distribution : Africa. Introduced into India and Brazil.

History and authority : First proved by Ghristison, Pharm, Journ., 1855, 474. First systematic proving was made by H. L. Chase, U. S. Introduced into Homoeopathic practice in 1864 by Reute, Allg. Hom Zeit 68, m' blatt. 19; trans. Am. Inst. Hom. 1874, 173. Allen's Encyclopedia Materia Medica Vol. VII, 466. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 795. Hering's Guiding Symptoms, Vol. VIII, 404.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Physostigma Venenosum in fine powder	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x — Drug Strength 1/10

Physostigma Venenosum in fine powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

PLANTAGO MAJOR

(Plant. m.)

Botanical name : *Plantago major* Linn. **Family**: Plantaginaceae

Common names : *Hindi*: Lahuriya; *English*: Greater plantain, Plantain, Ribgrass, Waybred; *French*: Grand Plantain; *German*: Grosser Wegerich.

Description : A perennial herb, with an erect stout root stock. Leaves alternate, radical 2.5 to 12.5 cm long, ovate or ovate-oblong, obtuse or sub-acute, entire or toothed, nearly glabrous, base tapering and decurrent into the petiole, 3 to 7 (comonly 5) nerved; petioles usually longer than blade, broad sheathing at base. Flowers scattered or crowded in long slender rather lax spikes, 5 to 15 cm long; bracts 1.5 to 2 mm long, shorter than the calyx, broadly ovate-oblong, obtuse, with scarious margins; calyx, 3 mm long, glabrous; sepals oblong, obtuse or subacute, obtusely keeled on the back and with broad scarous margins; corolla 4 mm long, glabours; lobes lanceolate, acute, reflexed. Fruit a capsule, ovoid, 3 to 4 mm long, glabrous. Seeds 4 to 8 angled, rugulose, dull black, 0.85 mm long.

Part used : Whole plant.

Microscopical : Rhizome cork, often arising superficially, but frequently not well developed; a thin periderm formed from sub-epidermal layer present. Primary cortex often consisting of round thin-walled cells forming a rather spongy tissue. Walls of the cells at the boundary between the primary cortex and the phloem are thickened but not lignified. Secondary phloem consisting of elongated parenchymatous cells interspersed with groups of sieve tubes, whole tissue being continuous on the outside with the round-celled primary cortex. Vascular bundles in fleshy rhizome separated by broad strips of parenchyma, parenchymatous cells also being abundant in the xylem itself. Cells of the xylem parenchyma are small with straight transverse walls.

Distribution : Temperate and alpine Himalayas, Assam, Konkan, Western Ghats and Nilgiris, Europe, Japan and North America.

History and authority : First proved by Alfred Health, mentioned in Hahnemann Monthly, 1868, Vol. III, 332. F. Humphreys of New York proved and published a monograph in 1871 containing provings of Eleven proves. Allen's Encyclop. Mat. Med., Vol. VII, 553. Hering's Guiding Symptoms, Vol. VIII, 445. A Dictionary of Pract. Mat. Med. Clarke, Vol. III, 838.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Plantago Major, moist magma containing solids 100 g and plant moisture approx. 350 ml	450 g

Strong Alcohol	683 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

RATANHIA
(Ratan.)

Botanical name : *Krameria triandra* Ruiz et. Pavon.

Family: Leguminosae (Fabaceae)

Synonym : *Ratanhia peruviana*.

Common names : *English*: Rhatany, Mapato, Pumacuchu; *French*: Ratanhia, Ruiz et Pavon; *German*: Ratanhiawurzel.

Description : A low shrub, 60 to 80 cm high, with spreading branches, greyish-brown bark, long, horizontal, cylindrical or somewhat tapering branched root, not more than 1 cm in thickness. Leaves few, simple, entire, alternate, sessile, round or obovate bearing silver-grey hairs. Flowers scarlet or red, large, solitary, on axillary peduncles; calyx-4, cruciform, scarlet-red; corolla-4 and red; stamens-4, monadelphous; ovary unilocular. Fruit indehiscent, 1 to 2 seeded. Odourless; taste bitter, astringent and sweet.

Part used : Root.

Macroscopical : Roots of variable length, not more than 1 cm in thickness, cylindrical or somewhat tapering, flexuous or wavy, externally dusky red to moderate brown, with smooth or slightly longitudinally wrinkled and devoid of transverse fissures. Bark, fracture slightly fibrous, woody, tough and splintery; internally pinkish-brown, less than 1/3 the radius of the root. Wood weak orange to weak yellowish-orange.

Microscopical : Root with phellem, phellogen and phelloderm, the phelloderm containing numerous lignified sub-rectangular sclereids. Cortex large, parenchymatous containing tannin. Endodermis, 1-layered with crushed cells; pericycle with numerous lignified subrectangular sclereids; phloem stratified by the alternating bands of phloem fibres and sieve-tissue. Stele with 4 or 5-arched primary xylem, surrounded by a secondary xylem with numerous xylem rays and a few annual rings; tracheae both large and small, larger ones 40 to 220 μ in diameter, isolated or in groups of 2 or 3, smaller ones 20 to 40 μ in diameter, in groups of 2 to 6; xylem fibres in groups of 15 to 30; both tracheae and xylem fibres being embedded in a starch-bearing parenchyma, which is mainly cellulosic but lignified near the tracheae. Parenchyma adjacent to the fibres, composed of longitudinal rows of small cells, each containing a prism crystal of calcium oxalate, 10 to 20 μ diameter. Middle lamella of the fibre of both the xylem and phloem are lignified; xylem rays 1 to 6 striate, 3 to 7 cells wide, containing resinous contents.

Distribution : Peru.

History and authority : Introduced into Homoeopathic practice in 1831 by proving by Hartlauband Trinks, R. A. M. L. III, 53. Allen's Encyclop. Mat. Med., Vol. VII, 290. Hering's Guiding Symptoms, Vol. IX, 24.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ratanhia in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcoho*l; 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x — Drug strength 1/10

Ratanhia in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies; 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

RHEUM
(Rheum)

Botanical name : *Rheum officinale* Baillon **Family**: Polygonaceae

Synonyms : *Rheum emodi* Wall., *Rheum palmatum* Linn.

Common names : *Hindi*: Hindirevandchini; *English*: Indian (China) rhubarb, Rhubarb; *French*: Rhubarbe; *German*: Rhabarber.

Description : Perennial herb, short with a thick vertical rhizome bearing fleshy, spreading roots. Leaves numerous, long-petioled, arising from upper part of the vertical rhizome. Lamina cordate to somewhat orbicular, entire or coarsely dentate. Flowers greenish-white or white to red, on elongated leafy panicles. Fruit, an achene with three broad thin wings and remains of the parianth at the base.

Part used : Rhizome.

Macroscopical : Drug in sub-cylindrical, barrel-shaped, conical plano-convex pieces, often perforated, sometimes in cubes or in rectangular pieces. Outer surface, smooth, longitudinally wrinkled or sunken, yellowish-brown and mottled with alternating striate of greyish-white parenchyma and brownish or reddish medullary rays. A few brown cork patches and branched scars (star-spots) of leaves-trace fibrovascular bundles present; fracture, granular, uneven, fractured surface pinkish-brown or greyish, exhibiting numerous reddish-brown points and lines on a white ground substance; smoothened transfers surface exhibits a cambium line near periphery, traversed for a short distance by radial lines representing medullary rays; vascular bundles stellate, 2 to 4 mm in diameter and scattered irregularly. Odour unpleasant and aromatic; taste bitter and astringent, gritty, when chewed saliva turns yellow. When pulverised, a yellowish-brown powder formed.

Microscopical : Rhizome with occasional patches of cork cells, parenchymatous cortex and phloem containing starch grains, rosette-crystals of calcium-oxalate and scattered groups of sieve plates. Medullary rays, wavy, 2 to 4 cells broad, parenchymatous and containing yellowish-brown anthraquinone derivatives. Cambium, at or near the periphery; xylem with wood-parenchyma containing starch grains and rosette crystals of calcium-oxalate; tracheae, scattered in small groups, mostly reticulately, sometimes spirally thickened. Compound stellate fibrovascular bundles in wood parenchyma and pith. Each bundle of stellate formed of a circle of open collateral bundles with phloem inside and xylem outside the cambium.

Root without pith, xylem radiate; can be distinguished by the yellow colour masses of the medullary ray cells, which are

insoluble in water and give a pink or red colour with alkali, owing to the presence of anthraquinone.

Distribution : India (sub-alpine and alpine Himalyas from 3400 to 3600 m), China and Tibet.

History and authority : Introduced into Homoeopathic practice in 1805 by Hahnemann, Frag. D. vir. Med., 185. Allen's Encyclop. Mat. Med., Vol. VIII, 303. Hering's Guiding Symptoms, Vol. IX, 28.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Rheum in moderately *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, there parts Purified Water and six parts *Strong Alcohol;* 3x and higher with D*ispensing Alcohol*.

(c) Trituration 1x — Drug strength 1/10

Rheum in moderately *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes to the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

RHODODENDRON CHRYSANTHUM
(Rhodo. ch.)

Botanical name : *Rhododendron chrysanthum* Pall. **Family**: Ericaceae

Common names : *English*: Golden or Yellow flowered rhododendron, Yellow snow rose; *French*: Rose de Siberie; *German*: Alpenrose, Gichtrose.

Description : Prostrate evergreen shrub, branches thick, minutely puberulent while young or nearly glabrous, bud-scales persistent. Leaves thick-coiaceous, glabrous, deep green, slightly paler beneath, obovate or oblong, 3 to 4 cm long, 1.5 to 2 cm wide, rounded to very obtuse, slightly cuneate and acute to obtuse at base, veinlets impressed above, petioles 1 to 1.5 cm long. Inflorescence 3 to 10 flowered, sessile, in terminal umbel; pedicels 2.5 to 5 cm long, brown pubescent; calyx very small; corolla 2.5 to 3.5 cm across, pale greenish-yellow, glabrous; stamens 10, puberculous towards base of filaments; ovary brown-pubescent style 1.5 to 2 cm long, glabrous, longer than stamens. Fruit capsule, narrowly oblong, 1 to 1.5 cm long, appearing during July to August.

Part used : Leaves and flower buds gathered when the latter are well developed but not opened.

Microscopical : Leaf: cuticle ridged and well developed on upper surface, epidermis 2 to 3 layered with small and thick-walled cells of which internal layers are mucilaginous, lower epidermis papillose; vascular bundles of veins associated with mechanical tissues. Petioles containing accessory strands in cortex, taniniferous secretory cells and some crystalline structures in ground tissues.

Distribution : Siberia, Japan, Equador and Peru.

History and authority : Introduced into Homoeopathic practice in 1831 by provings by E. Seidel (Germany). Allen's Encyclop. Mat. Med. Vol. VIII, 311. Hering's Guiding Symptoms, Vol. IX, 35.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Rhododendron Chrysanthum in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x Drug strength 1/10

Rhododendron Chrysanthum in *coarse powder*	100 g

Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Trituration: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

RHUS VENENATA
(Rhus. ven.)

Botanical name : *Rhus venenata* DC. **Family**: Anacardiaceae

Synonym : *Rhus vernix* Linn.

Common names : *English:* Poison sumac, Swam-sumac, Poison elder, Poison dogwood.

Description : Shrub, 3 to 9 m high. Stem dark grey, erect, slender, branching at the top, smooth, 2.5 to 12 cm in diameter. Stem bark mottled with conspicuous lenticles. Leaves odd-pinnately compound; leaflets 7 to 13, obovate, oblong, dark green and glossy on ventral surface, paler on dorsal surface, with margins entire and slender, reddish-green petioles. Midrib and veins prominent. Leaves scars prominent, alternate and somewhat crescent shaped. Flowers small, dioecious, yellowish-green to white, in narrow axillary panicles, appearing in June. Fruit a drupe, white, pale yellow or creamy, smooth, with striations on waxy mesocarp.

Part used : Stem and leaves.

Microscopical : Stem: Epidermis 1-layered with numerous unicellular hairs, subepidermal cells in 1 to 2 rows, cortex parenchymatous, with cells containing rosette crystals of calcium oxalate; pericycle a narrow ring of sclerencymatous tissue; phloem with numerous resin canals, containing dark reddish-brown oleo-resinous substance; xylem ring prominent, containing tracheae, wood fibres and medullary rays; intraxyllary phloem present. Pith large, parenchymatous.

Leaves: Epidermis 1-layered with numerous unicellular trichomes; palisade below upper epidermis, spongy parenchyma somewhat compactly arranged near midrib and contain rosette crystals of calcium oxalate; pericyclic fibres in a ring, enclosing resin canals beneath.

Distribution : North America, from Southern Quebec to Central Florida and Mississippi.

History and authority : Introduced into Homoeopathic practice in 1835 by proving by Bute, United States. Allen's Encyclop. Mat. Med. Vol. VIII, 378. Hering's Guiding Symptoms, Vol. IX, 115.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Rhus Venenata in *coarse powder*	100 g
Purified Water	200 ml

Strong Alcohol 824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Caution : The tincture poisons the skin, handle with great care. Not to be prescribed below 3x.

RUMEX CRISPUS
(Rumex. c.)

Botanical name : *Rumex crispus* Linn. **Family**: Polygonaceae

Common names : *English*: Curled, narrow, sore or yellow dock Garden patience; *French:* Patience frisee; *German:* Krauser Ampfer.

Description : A smooth, perennial herb, with deep, spindle-shaped, yellow root. Stem, 90 to 120 cm high, angular, furrowed, somewhat zigzag. Leaves lanceolate, petiolate, whorled, acute, wavy-curled, smooth and light green; the radical leaves long petioled truncate or scarcely heart-shaped at the base; the cauline, acute at both ends and nearly sessile. Flowers bisexual, green, small, numerous and on short, rather stout pedicels, forming crowded and dense whorled racemes. Inner fruiting perianth segments, 4 x 3 mm, green, cordate or truncate, margin entire, at least one lobe possessing large tubercle. The nut, 2.5 mm by 3.0 mm, ovoid, pointed and slimy brown.

Part used : Rhizome.

Microscopical : Rhizome with cork cells, light brown and a collapsed phellogen. Hypodermis with several rows of collenchymatous cells. Cortex broad, parenchymatous with thin-walled cells, some containing starch grains, others rosette crystals of calcium oxalate; occasional leaves-trace bundles present. Fibro-vascular bundles small, in a circle with few tracheids and fibres. Pith parenchymatous, some cells containing starch grains, others rosette crystals of calcium oxalate.

Distribution : United States. Introduced into Northern America, Mexico, Chile and New Zealand.

History and authority : First proved by Henry A. Houghton, Inaug. Diss., Phila, Hom. Med. Coll., 1852. Proved by Houghton, Thesis Hahn. Med. College of Penna, 1852; Joslin, Trans. Am. Insot, 1858. Allen's Encyclop. Mat. Med., Vol. VIII, 417. Hering's Guiding Symptoms, Vol. IX, 125.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Rumex Crispus in *coarse powder*	100 g
Purifed Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with D*ispensing Alcohol.*

SABAL SERRULATA
(Sab. ser.)

Botanical name : *Sabal serrulata* Sch. **Family**: Palmaceae

Synonym : *Serenoa serrulata* Hook f.

Common name : *English*: Saw palmetto.

Description : A creeping, ever green shrub, up to 1 m long, with large fibrous roots extending several feets from the stem. Leaves large densely set with aculeate-serrate petioles, palmately fan-shaped, plaited and many cleft with fibrous thread hanging between the segments. Flowers small, perfect, greenish-purple on thick, branching spadix. Fruits oblong-ovate, dark purple or brown, containing a pit resembling that of olive.

Part used : Ripe fruit.

Macroscopical : Fruits: are ovoid, about 20 mm long and 12 mm in diameter, externally brownish-black and smooth. The surface is slightly oily, even or with large irregular depressions and ridges. The base shows either a short stalk or the small-depressed scar left by its removal. A thin, tough epicarps, a soft sarcocarp, about 1 mm thick and a thin, friable, smooth, brown endocarp enclosing a hard, ovoid, reddish-brown seed, about 15 mm long and 6 mm in diameter. The odour is strongly aromatic and fruity and the taste is sweetish acrid and oily.

Distribution : On Atlantic coast of U.S.A. from South Carolinato Florida.

History and authority : A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1042.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sabal Serrulata in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

SALIX NIGRA
(Salix. n.)

Botanical name : *Salix nigra* Marsh. **Family**: Salicaceae

Common names : *English*: Black willow, pussy-willow.

Description : A small tree, up to 8 m high, with rough black bark and very brittle branches at the base. Leaves stipulate, alternate, narrowly lanceolate, pointed and tapering at each end, serrate, smooth (except on petioles and mid-rib), green on both sides. Flowers in peduncled catkins on the top of lateral leafy branches; scales entire, greenish yellow, more or less hairy, falling before pods are ripe.

Part used : Bark.

Macroscopical : The bark occurs in long, thin, tough, fibrous strips covered externally by a thin, brownish or greenish-brown, wrinkled cork; the inner surface is pale reddish-brown in colour. It has a bitter, astringent and somewhat aromatic taste.

Distribution : United States, along streams especially Southwards.

History and authority : Mentioned in Homoeopathic literature by E. D. Wright in 1875, Am. Hom. Obs. XII, 177. Allen's Encyclop. Mat. Med., Vol. X, 630. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1067.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Salix Nigra in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

SAMBUCUS NIGRA
(Samb. nig.)

Botanical name : *Sambucus nigra* Linn. **Family**: Caprifoliaceae

Synonym : *Sambucus lactntata* Mill.

Common names : *English*: Black berried European elder, Bore tree Eldrum; *German*: Schwarzer Hollunder; *French*: Sureau.

Description : Deciduous tree, 4 to 9 m high, with deeply furrowed whitish bark; branches greyish and strongly lenticellate. Leaves petiolate, opposite, odd-pinnate, leaflets 3 to 7, short stalked, elliptic, acuminate sharply serrate, shining, paler beneath, 5 to 16 cm long. Flowers creamy-white, in five-parted cymes; calyx 5, small and green; corolla 5, ovate, rotate, 4 to 8 mm in diameter forming a short tube; stamens-5, epipetalous, filaments short, anthers yellow; ovary inferiorand tricarpellary. Fruits black, lustrous, globose, 3-celled and 50 to 65 mm in diameter.

Part used : Leaves and flowers.

Microscopial : Leaves dorsiventral, trichomes glandular with uniseriate stalk and ellipsoidal, muticellular head, leaves-teeth possessing glands at vein-terminations, stomata ranunculaceous, palisade with arm-palisade cells. Petiole with extra floral nectarines and five vascular strands in an arc in transcection through distal end.

Distribution : Europe, West Africa, Great Britain and Siberia.

History and authority : Introduced into Homoeopathic practice in 1819 by Hahnemann. Allen's Encyclop. Mat. Med., Vol. VIII, 477. Hering's Guiding Symptoms, Vol. IX, 188.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sambucus Nigra in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

SENECIO AUREUS
(Sen. aur.)

Botanical name : *Senecio aureus* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: Fals valerian, Golden senecio, Life root, Regwort, Squaw weed; *French*: Senecon; *German*: Kreuzpflanze.

Description : A perennial herb. The underground portion consists of a slender branching rhizome system from which arise stems bearing alternate lyrate to pinnatifid leaves, the upper-most ones being sessile and bractiform. The basal radical leaves are rounded, acute to oblong, deeply cordate at the base and form a rosette. The inflorescence consists of loose corymbs of bright yellow heads.

Part used : Whole plant.

Macroscopical : Mixture of broken stems, leaves and flower heads; stems from 3 to 6 cm in length, which when young white tomentose but when mature glabrous. Flower heads up to 25 mm in breadth and showing a flat naked receptacle surrounded usually by 2 series of lanceolate-linear appressed bracts and bearing usually 10 bright ligulate florets and numerous yellow, perfect, tubular disc florets each with a white bristly pappus. Odour aromatic; taste bitter, acrid and pungent.

Distribution : United States America.

History and authority : Proved and introduced by A. E. Small, U.S. Med. and Surg. J; 151, 1866. Mentioned in Allen's Encyclop. Mat. Med., Vol. VIII, 582.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Senecio Aureus in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

SOLANUM NIGRUM
(Sol. nig.)

Botanical name : *Solanum nigrum* Linn. **Family**: Solanaceae

Common names : *Hindi*: Makoi; *English*: Black nightshade, Garden nightshade; *French*: Morelle noire; *German*: Schwarzer Nachtschatten.

Description : A variable annual herb, 30 to 60 cm high. Stem erect, green, angular, glabrous or more or less pubescent, much divaricately branched. Leaves cauline, simple, alternate, dull green, thin, ovate or ovate-lanceolate, sub-acute or acuminate, glabrous, entire to sinuate toothed, cuneately narrowed to the base, 2.5 to 9 cm by 2 to 5 cm, long petioled, exstipulate. Flowers small, in extra-axillary sub-umbellate 3 to 8 flowered cymes; peduncles 6 to 20 mm long, slender; pedicels 6 to 10 mm long, very slender; calyx 3 mm long, glabrous, lobes 5, oblong, obtuse, 1.25 mm long; corolla 4 to 8 mm long, white or very pale-violet, divided more than half way down into 5 oblong subacute lobes, filaments short, flattened, hairy at base, anthers 2.5 mm long, yellow, oblong obtuse, notched at apex. Ovary globose, glabrous, style cylindric hairy. Berry 6 mm in diameter, globose, purplish black, sometimes red or yellow, smooth, shining. Seeds discoid, 1.5 mm in diameter, minutely pitted, yellow. Berries oleaginous, bitter and pungent.

Part used : Whole plant with berries including roots.

Microscopical : Leaf, epidermis 1-layered, abnormal stomata with single guard cell or degenerated cells, trichomes with swollen base on upper epidermis; palisade 5 to 10 layered below the upper epidermis followed by spongy parenchyma. Palisade ratio 2 to 4.

Stem, epidermis 1-layered, containing periderm consisting of phellem and phellogen; collenchyma compact, 2 to 3 layered; cortex small parenchymatous; endodermis 1-layered; vascular bundles in a ring, conjoint, collateral and open.

Distribution : India, Ceylon. All temperate and tropical regions of the world.

History and authority : Mentioned in Homoeopathic literature in 1840, Huges XIV, 403. First proved by Lembke, Germany in 1853. Allen's Encyclop. Mat. Med., Vol. IX, 57. A Dictionary of pract. Mat. Med., Clarke, Vol. III, 1208.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Solanum Nigrum moist magma containing solids 100 g and moisture approx. 400 ml	500 g

Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

STRAMONIUM
(Stram.)

Botanical name : *Datura stramonium* Linn. **Family**: Solanaceae

Synonym : *Datura tatula* Linn.

Common names : *Hindi*: Sada Dhutura; *English*: Thorn apple, Devil's apple; *French*: Pomme epineuse; *German*: Stechapfel.

Description : A coarse, bushy, annual, 0.6 to 1.2 m high, glabrous or farinose puberulous. Leaves stalked, about 18 cm long, ovate deeply toothed or sinuate, pale green. Calyx 2.5 to 4.5 cm; lobes 6 mm long, ovate lanceolate. Corolla 7.5 to 15 cm long, white, 2.5 to 7.5 cm diameter, lobes 5, cuspidate. Capsule erect, ovoid, deeply 4-valved, covered with rigid long and short prickles surrounded below by the enlarged reflex base of the calyx.

Part used : Whole plant.

Macroscopical : Leaves are dark, greyish-green and much shriveled and twisted as a result of drying. The petiole is short and twisted. Young leaves bear numerous trichomes but older ones are almost glabrous. Stems dichotomously branched. Ovary is superior, conical spuriously tetralocular in lower part and covered with short emergences. Odour disagreeable and characteristic; taste unpleasant and bitter.

Microscopical : Leaf: smooth cuticle and sinuous anticlinal walls of the epidermal cells, cruciferous stomata, rare in the upper epidermis but numerous in the lower; straight or slightly curved uniseriate, conical trichomes with thin warty walls, usually 3-celled, the basal cell being the largest and usually exceeding 50 µ in length and 35 µ breadth, the glandular trichomes which are usually curved composed each of a short 1 or 2-celled pedicel and a 2 to 7 celled pyriform glandular head; a single row of palisade cells and beneath it the crystal layer containing in most of the cells a single cluster crystal of calcium oxalate or occasional prisms of microspheroidal crystals; the presence of perimedullary phloem in the midrib.

Stem: the trichomes and epidermis resembling those of the leaf but often attaining a length of 800 µ; occasional pericycle fibres; numerous wood fibres and vessels, crystals sacs and perimedullary phloem of stem, the pollen grains 60 to 80 µ in diameter, with three large pores and a coarsely warty exine.

Distribution : Occurs abundantly in the Temperate Himalayas form Kashmir to Sikkim up to 3000 m, hilly tracts of Madhya Pradesh and South India.

History and authority : Proved and introduced in Homoeopathic Materia Medica by Hahnemann. Allen's Encyclop. Mat. Med., Vol. IX, 175. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1272.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Stramonium, moist magma containing solids 100 g and moisture approximately 200 ml	300 g
Purified Water	200 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

STROPHANTHUS HISPIDUS

(Stro. his.)

Botanical name : *Strophanthus hispidus* DC. **Family**: Apocynaceae

Common names : *French*: Somenco de strophanthe; *German*: Strophanthuss Semen.

Description : An evergreen, woody, climbing shrub. Stem 90 cm long, with hanging festoons and dichotomous branches. Leaves mucronate and acuminate. Flowers cream-coloured or yellow at the base, purplish spotted above and in terminal cymes, appearing during February to March; corolla with long tailed and twisted lobes. Fruit a thick-skinned, lance-ovate follicle, occurring in divergent pairs and containing numerous closely packed hairy seeds with long awns attached to an end. Odour heavy when the seeds are crushed and moistened; taste strongly bitter.

Part used : Ripe seeds.

Macroscopical : Seed: 7 to 25 mm long, 2.5 to 5 mm broad, 0.5 to 2 mm thick oblong-lanceolate, somewhat compressed, with obtuse-base and acute to narrowly acuminate apex, light brown to dark brown without greenish tinge, with few and silky hairs bearing a distinct raphe on one side. Fracture short and soft, the broken surface white and oily.

Microscopical : Seed: Epidermis with elongated polygonal tubular cells possessing straight, thick and lignified anticlinal wall and no prism crystals of calcium oxalate. Trichomes, unicellular bent over to be appressed to the seeds and each possessing a single narrow thick and lignified strip, extending along the entire length of the adaxial side and connecting down with a ring shaped thickening at the base of trichomes. Rest of the part of testa consisting of a narrow layer of more or less collapsed thin walled parenchyma. Endosperm and the embryo with moderately thick-walled parenchyma, containing abundant fixed oil and aleurone grains.

Distribution : Tropical Africa.

History and authority : Mentioned in “Index to proving” by T. L. Bradford. A Dictionary of Practical Mat. Med. Clarke, Vol. III, 1286.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Strophanthus Hispidus in moderately *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

SUMBUL
(Sumbul)

Botanical name : *Ferula sumbul* Hook. f. **Family**: Umbelliferae (Apiaceae)

Common names : *English*: Sumbul root, Musk root, Radix sumbul; *French*: Racine de sumbul; *German*: Sumbulwurzel.

Description : A tall perennial of limited duration, dying after flowering. Stem about 2.7 m in height nearly straight, glabrous purple. Radical leaves about 0.7 m long with short, channeled, sheathing petioles, triangular, ternate, leaflets ovate, smooth, flat, bright green; cauline leaves smaller and finally reduced to sheathing brackets. Flowers polygamous in pedunculate terminal umbels.

Part used : Root.

Macroscopical : Root: occurs in short, more or less cylindrical pieces that are usually from 3 to 6 cm in width and about the same in length, often dividing in upper part in 2, 3, or more branches. Branches not more than 1 cm in diameter and some bear a depressed scar left by aerial stem. Drug spongy, fibrous and very light. Outer corky surface dark brown to black having numerous transverse wrinkles with encircling scars of fallen leaves.

Microscopical : Cortex layer is tough and can peeled off. Transverse section shows a thin brown external layer of cork and very thin bark and narrow pale yellowish ring of porous xylem bundles surrounding large central parenchymatous tissue in which are distributed irregular pale yellowish woody strands. The parenchyma is dark in colour with shining scattered resinous spots. Fracture fibrous; odour agreeable and musky and the taste bitter and slightly aromatic.

Distribution : Central Asia and Russia.

History and authority : Lembke proved and introduced it in Homoeopathic practice. Allg. Hom. Zeit. XXXIV, 273. Allen's Encyclop. Materia Medica Vol. IX, 443. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1337. Hering's Guiding Symptoms, Vol. X, 206.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sumbul in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with D*ispensing Alcohol*.

SPIGELIA
(Spig.)

Botanical name : *Spigelia marllandica* Linn. **Family**: Loganiaceae

Common names : *English*: Pink root, Indian pink root, Maryland pink root, Worm Grass, American Wormgrass; *French*: Brinviliers, Poudre aux vers, Spigelie du Maryland; *German*: Wurmtrechende.

Description : Perennial herb, 30 to 40 cm high, with small, twisted, knotty horizontal rhizome, 5 cm long, 2 to 3 mm in diameter, giving numerous long, slender fibrous yellow roots beneath. Stems several, erect, purplish, simple, smooth, quadrangular above and rounded below. Leaves few, entire, opposite, sessile, exstipulate, ovate-lanceolate, acute, smooth, paler beneath, slightly pubescent on veins and 5 to 8 cm long. Flowers 4 to 12, brilliant red, large, sessile or very short stalked, tubular, funnel-shaped, ebracteate, placed singly at short intervals on one side of spike terminating each stem; calyx small, smooth, persistent, very deeply divided into 5-linear subulate, erect segments; corolla tubular-funnel shaped, 5-lobed at summit, narrow acute, bright crimson outside, yellow within; stamens-5, epipetalous, filaments short, slightly exserted, anthers erect linear-oblong and 2-celled, ovary superior, compressed and bilocular, style long flattened below and hairy above. Fruit loculicidally dehiscent capsule, compressed laterally, 2-celled smooth, yellow or greenish-yellow.

Part used : Whole Plant.

Macroscopical : Rhizome entire or in pieces, 1.5 to 7 cm long, 2 to 5 mm in diameter, finely annulate, dark brown externally, tortuous knotty, bearing numerous cup-shaped scars of stem bases above and slender, coarse, wiry, finely branched rootlets below; fracture short, brittle uneven, inner surface containing whitish bark, yellowish wood and dark-brown pith. Rootlets light coloured, thin, long brittle and sometimes containing bark attached at terminal parts. Odour aromatic; taste bitter, sweetish, pungent and nauseous.

Microscopical : Rhizome: Epidermal cells dark brown with outer walls thick; cortex 10 to 15 layered with isodiametric cells containing spheroidal polygonal starch grains of 6 µ in diameter; endodermis of tangentially elongated cells, containing casparian spots on radial walls; phloem 150 µ broad, containing phloem parenchyma and sieve tubes; xylem compact, radially arranged, with tracheae and tracheids possessing bordered pits and spiral thickenings in longitudinal sections; interxylary phloem containing sieve tubes surrounded by phloem parenchyma; pith parenchymatous with thick-walled cells containing small starch grains.

Root: Epidermal cells with numerous hairs; cortex broad and parenchymatous containing small starch grains; radial fibro-vascular bundles containing 6 to 8 alternating patches of xylem and phloem; pith small.

Distribution : West Indies, East North America to Florida and Texas.

History and authority : Introduced into Homoeopathic practice in 1819 by Hahnemann. Allen's Encyclop. Mat. Med., Vol. IX, 75. Hering's Guiding Symptoms, Vol. IX, 437.

Preparation : (a) Mother Tincture ϕ

	Drug strength 1/10
Spigelia in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x

	Drug strength 1/10
Spigelia in *coarse powder*	100 g
Saccharum liactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

TARENTULA HISPANA
(Tarent. h.)

Zoological name : *Tarentula hispana* **Family**: Lycosidae

Synonyms : *Lycosa tarentula*, *Aranea tarentula*.

Description : Body stout, 3.8 cm to 5.1 cm long, colour greyish brown on upper surface and deep saffron yellow on the under surface with transverse black band. A hairy spider, with six eyes and several pairs of legs, the third pair particularly being the shortest. The margin of the thorax grey, with a radiated dorsal line of the anterior part of the dorsum, marked with triangular spots. The poison of male and female are identical. According to Dr. Mariano de la Paz Grells Pardo, Spain, the spider is most poisonous in the month of July.

Distribution : South America and South Europe especially Spain.

Part used : The entire spider.

History and authority : Nunez, first proved it in 1864 in Spain. Mentioned in N. A. Journ. of Hom., 1872. Allen's Encyclop. Mat. Med., Vol. IX, 516. Hering's Guiding Symptoms, Vol. X, 249. A Dictionary of Practical Mat. Med., Clarke, Vol. III, 1372.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Tarentual Hispana	100 g
Purified Water	300 ml
Glycerin	200 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x and higher in accordance with the method, Vol. I, H.P.I.

(d) Potencies: 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

Caution : Poisonous and not to be prescribed below 3x.

TELLURIUM
(Telluri)

Chemical Formula : Te **At. wt.**: 127.60

Common names : Aurum paradoxum, metallum oroblematum.

Description : A greyish white, lustrous, brittle, crystalline solid, hexagonal, rhombohedral structure or dark grey to brown, amorphous powder with metallic characteristics; insoluble in *water*; Not attacked by *hydrochloric acid;* reacts with *nitric acid*; dissolves in concentrated or fuming *sulphuric acid*, forming a red solution. In presence of air, dissolves in *potassium hydroxide* with formation of a deep red solution. Combines with halogens. Burns in air with a greenish-blue flame, forming the dioxide having garlic odour. Occurs as tellurides in combination with metals in the minerals tetradymite, attaite, caloradolite, found as the dioxide, tellurite; found also native associated with silver and gold.

Specific gravity : (Crystalline form) 6.11 to 6.27.

History and authority : Proved and introduced into homoeopathy by Hering in 1850. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1385. Allen's Encyclopedia Mat. Med., Vol. IX, 555.

Preparation : (a) Trituration 1x — Drug strength 1/10

Tellurium	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

TEREBINTHINAE OLEUM

(Tereb. o.)

Common names : Rectified oil of turpentine, spirit of turpentine.

Description : A colourless limpid liquid; odour characteristic; taste, pungent and somewhat bitter, both odour and taste become more pronounced and less agreeable on ageing or exposure to air. Almost insoluble in *water*. Soluble in 5 volumes of *alcohol*. Obtained by distillation and rectification from the oleoresin, obtained from *Pinus palastris.* Miller and from other species of *Pinus* (Fam. Pineacae) which yield terpene oils exclusively.

Specific gravity : 0.854 to 0.868.

Refractive index : 1.467 to 1.477.

Non-volatile matters : When evaporated rapidly in a flat-bottomed nickel dish, 9 cm in diameter and 1.5 cm in depth, on a boiling water bath, 2 g leaves not more than 0.01 g of residue.

Fixed oils : 3 drops evaporated from the same spot of an unsized paper leave no stain.

Storage : Keep in well-closed container protected from light and store in cool place.

History and authority : First proved by E. Seidel, Germany. Introduced into Homoeopathic Materia Medica by Hartlaub and Trinks. Allen's Encyclopedia Materia Medica, Vol. IX, 571. Hering's Guiding Symptoms, Vol. X, 275. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1393.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Terebinthinae oleum — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Strong Alcohol.*

Revised Monograph Appeared in HPI Vol. X

TERMINALIA CHEBULA

(Term. ch.)

Botanical name : *Terminalia chebula* (Gaertn.) Retz. **Family**: Combretaceae

Common names : *English*: Myrobalan; *Hindi*: Harar.

Description : A moderate sized, sometimes large, deciduous tree. Leaves not clustered, often subopposite, 10 to 18 cm, ovate or elliptic, usually acute, not acuminate, rounded at the base; petiole 2.5 cm, often with glands at its summit. Spike terminal, often panicled. Flower dull white, with an offensive smell, all hermaphrodite. Fruit a drupe, glabrous, pendulous, 2 to 4 cm long, ellipsoid or obovoid from a broad base, more or less 5-ribbed when dry due to the 5-ribbed endocarp.

Part used : Semi-mature fruit.

Macroscopical : Semi mature fruit: Yellowish-brown, ovoid, 20 to 35 mm long, 13 to 25 mm wide, wrinkled longitudinally, carpel 5 to 6 ribbed longitudinally, hard and stony; seed like yellow, 15 to 25 mm long, rough. Pulp 3 to 4 mm thick, adhered to seed. Odourless; taste astringent, later sweetish.

Microscopical : Epicarp forms several layers of corky cells, often containing a few starch grains, mesocarp of round parenchymatous cells, having brownish cell contents. In young fruits numerous stellate crystals of calcium oxalate present. In semi-mature fruit, crystals common but not spherical. Starch absent. Isolated vascular strands and sometimes long strands of vessels intermingled with parenchymatous tissue are found in semi-mature fruits. All the vessels have pitted thickenings.

Distribution : Common throughout India.

History and authority : Drugs of Hindoosthan, S. C. Ghose, Ed. V, 299.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Terminalia Chebula, moist magma containing solid 100 g and plant moisture 150 ml	250 g
Purified Water	250 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

TINOSPORA CORDIFOLIA
(Tino.spo.)

Botanical name : *Tinospora cordifolia* Miers.

Family: Menispermaceae

Common names : *Hindi*: Gulancha, Giloe, Gaduchi.

Description : A large glabrous climber with succulent, corky, grooved stems, branches sending down, slender, pendulous fleshy roots, terete, striate with tubercles, pale, sometimes shining or glaucous bark. Leaves membranous, 7 to 9 nerved, 5 to 10 cm in diameter, cordate, glabrous, acute or acuminate; petiole 2.5 to 7 cm long. Raceme exceeding the leaves, axillary or terminal; bracts subulate. Male flower cluster in the axils of small subulate bracts; sepals yellow; stamens free; female flowers usually solitary, similar to male, but sepals green; ripe carpels pisiform. Fruit a drupe, size of a pea or small cherry red.

Part used : Stem and root.

Macroscopical : Stem light, cylindrical pieces of wood, in bits upto 15 or 20 cm long and about 2 to 3 cm diameter; bark light brown with transverse markings and marks of lenticels, thin, papery, easily separable from the wood. Dry wood breaks into wedge-shaped longitudinal pieces. Wood soft, luster dull, fracture short and smooth.

Microscopical : Large number of vessels are present which attain a fairly big size pores often visible to the naked eye. Xylem parenchyma trachieds and wood fibres comparatively less in proportion to vessels. Bordered pits slit-like on vessels. Medullary rays quite distinct from one another and often disintegrating in dried wood. Starch present in ray-cells and secondary phloem cells. Cork cells contain a brown pigment in their walls. Stone cells absent in periderm.

Distribution : Throughout worm parts of India.

History and authority : Drugs of Hindoosthan, S. C. Ghose, 304. Ed. V.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Tinospora Cordifolia, moist magma containing solids 100 g and plant moisture 488 ml	588 g
Purified Water	69 ml
Strong Alcohol	480 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

VALERIANA OFFICINALIS
(Valer. of.)

Botanical name : *Valeriana officinalis* Linn. **Family**: Valerianacae

Common names : *Hindi:* Billilotan, Kalavala*; English:* All heal Wild Valerian; *French*: Valeriane Sauvage, Potite valerian, Racine de valeriane; *German:* Augenwurzel Baldrianwurzel, Katzengaldrian.

Description : A deciduous herb, with a tuberous, short rhizome, bearing numerous slender, fleshy tapering, pale-brown rootlets, 7 to 12 cm long; one or more stolons. Stem erect, 90 to 150 cm high, hollow, furrowed, branched in the terminal part and hirsute at base. Leaves both radical and cauline, the radical being on long petioles, whereas the cauline are opposite or alternate, exstipulate and pinnatisect with clasping petioles. Leaflets sessile, lanceolate and dentate. Flower numerous, small, white or pink, in racemes of cymes. Fruit, oblong-ovate, 4-ridged, 1-seeded achenes. Odour like that of isovaleric acid; taste sweetish, camphoraceous and somewhat bitter.

Part used : Rhizome dried in artificial heat soon after collection.

Macroscopical : Rhizome, from 2 to 4 cm in length and 1 to 2.5 cm in diameter, sometimes split into longitudinal pieces; externally weak brown to moderate yellowish-brown or dark brown; internally brown to moderate yellowish-brown, with a thick bark and narrow central cylinder; upper part with stem bases, leaves scars and a short horizontal stolon; the outer surface with numerous slender, brittle rootlets and occasional root scars; fracture of rhizome short and horny.

Microscopical : Rhizome, cork 5 to 7 layered with brown polygonal cells. Cortex broad with thick-walled parenchyma, traversed by numerous root and leaves-trace bundles; stone cells of rare occurrence. Endodermis of tetragonal or polygonal cells, containing globules of volatile oil. Pericycle a narrow band of parenchyma. Fibro vascular bundles, collateral, somewhat twisted, arranged, in a ring; tracheae 10 to 30 µ in diameter, 40 to 120 µ long, with oblique perforations and mostly with reticulate and spiral thickenings. Medulla a board zone of parenchyma containing starch grains and islets of polygonal sclereid, 30 to 80 µ in diameter.

Rootlets: Epidermis of a single layer of papillose cells, bearing a number of root hairs. Cork replaces epidermis in old rootlets. Hypodermis 1-layered with quadrangular to polygonal cells, 20 to 60 µ wide, up to 150 µ long with radial walls transversely wrinkled, containing globules of volatile oil and occasionally small prismatic crystals; cortex parenchymatous with cells axially elongated and

containing starch grains. Endodermis single-layer of thin-walled cells 8 to 15 µ wide and upto 180 µ long with radial walls thickened. Peri-cambium of 1 to 2 layers of thin-walled cells. Stele with 4 to 11 strands of xylem and a central parenchyma. Stolen arrangement of tissues similar to that of rhizome with a fistular pith.

Distribution : India (Kashmir) and Europe.

History and authority : Introduced into Homoeopathic practice in 1805 by Hahnemann, Frag. D. vir. 251. Allen's Encyclop. Mat. Med., Vol. X, 59.

Preparation : (a) Mother Tincture ϕ

	Drug Strength 1/10
Valeriana Officinalisin *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

(c) Trituration 1x

	Drug Strength 1/10
Valeriana Officinalisin *coarse powder*	100 g
Saccharum Latis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

VERATRUM ALBUM
(Ver. alb)

Botanical name : *Veratrum album* Linn. **Family**: Liliaceae

Common names : *English*: European hellebore, White hellebore; *French*: Varaire, Veratre blanc; *German:* Weisser Germer.

Description : A perennial, deciduous herb, with an erect rhizome, frequently dividing into 2 to 3 branches. Stem 1.5 m high, round, fistular, almost covered by sheathing leaves bases, downy above. Leaves plaited, broad, ovate, acute or rather blunt, glabrous above and downy beneath and provided with numerous nerves. Flowers light-yellow or yellowish-white, in erect panicled racemes, appearing during June to August. Odour offensive from roots; taste bitter, extremely acrid and poisonous.

Part used : Rhizome.

Macroscopical : Rhizome: 5 cm long, 2 cm in diameter, dull black, rough and wrinkled externally, with the remains of numerous concentrically arranged leaves base at the upper part and root-scars containing a distinct slender xylem in the center. Rootlets numerous, completely enveloping the rhizome, dull grey or yellowish and shriveled longitudinally. Lower extremity of the rhizome, bluntly conical or truncate.

Microscopical : Rhizome: epidermis with reddish-brown to yellowish-orange cork-like cells. Cortex moderately broad, containing spherical or ellipsoidal starch grains and some with raphides of calcium oxalate, upto 60 µ in length. Root-trace bundles, without cambium, present in the cortex at some places. Endodermis wavy, two layered, with somewhat lignified cells, considerably thickened at the inner and radial walls, having U-shaped lumen in the horizontal plane; traversed at some places by root-trace bundles. Stele broad parenchymatous zone with cells resembling the cortex and fibro-vascular bundles arranged in irregular interrupted circles. Sometime, tracheae possess scalariform thickenings.

Rootlets: epidermis with more or less quadrangular cells possessing thickened outer radial walls. Hypodermis, 1-layered, with more or less compressed cells, beneath which are present 2 to 3 layers of collenchyma. Aerenchymatous with large, irregular space surrounded by parenchyma cells in outer cortex. Cortical parenchyma, a broad zone of spherical cells, becoming smaller towards the central cylinder, mostly containing spherical or ellipsoidal starch grains and a few cells also containing raphides of calcium oxalate. Endodermis with cells possessing, considerably thickened radial and inner-walls and a U-shaped lumen. Pith, small,

central zone of thick-walled cells containing crystals of calcium oxalate and starch grains.

Distribution : Middle and southern Europe, Russia, China and Japan.

History and authority : Introduced into Homoeopathic practice in 1805 by Hahnemann, Frg. d. vir., 254. Allen's Encyclop. Mat. Med., Vol. X, 73.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Veratrum Album in *coarse powder*	100 g
Purified Water	200 ml
Strong Alochol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x — Drug strength 1/10

Veratrum Album in *coarse powder*	100 g
Saccharum lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 1x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

VERBASCUM THAPSUS
(Verb. th.)

Botanical name : *Verbascum thapsus* Linn. **Family**: Scrophulariaceae

Common names : *Hindi*: Gidar Tomaku, *English*: Common Mullein, Vevet Dock; *German*: Wollkraut; *French*: Bullonblanc.

Description : A densely, woolly, biennial herb. Leaves are ovate-oblong, tomentose, acute and appear as a rosette above ground during the first year. During the spring or early summer of the second year a long woolly stem shoots, upto the height of 1.3 m bearing tomentose, decurrent leaves along the greater portion of its length and ending in a long, dense, cylindrical spike of yellow flowers.

Part used : Whole plant.

Macroscopical : Leaves greenish or yellowish grey, entire and crumpled or broken, sessile, oblong or oblong-lanceolate with entire margin and densely tomentose surfaces, the latter due to long, branching, multicellular, non-glandular, candelabra-shaped hairs. Odour distinct; taste mucilaginous and slightly bitter.

Microscopical : Powdered drug dark green. The most diagnostic characters are slightly lignified, candelabra-shaped (branched) non-glandular hairs, which consist of a jointed central axis with whorls of 2 to 8 lateral cells, arising at the joints or summit. Glandular hairs with 1-celled stalk and 1-celled head are also present.

Distribution : Temperate Himalayas, Western Ghats, Nilgiris and Canada.

History and authority : Introduced into Homoeopathic practice in 1821 by Hahnemann, R. A. M. L., VI. Allen's Encyclop. Mat. Med., Vol. X, 114. A Dict. of Pract. Mat. Med., Clarke, Vol. III, 1526.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Verbascum Thapsus in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one Thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture,four parts Purified Water and five parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol*.

VIBURNUM OPULUS
(Vib. op.)

Botanical name : *Viburnum opulus* Linn. **Family**: Caprifoliaceae

Synonym : *Virburnum edule* (Michx.) Raf.

Common names : *English*: Truecramp bark, Wild Guelder Rose, Cranberry tree bush; *German:* Wasserholder rinde: *French:* Ecorce d' Obier.

Description : Deciduous shrub, 4 m high. Leaves simple, opposite, petiolate, broadly ovate, palmetly-veined, 3-lobed, middle lobe elongated, margins irregularly toothed or entire, apex acuminate; petiole grooved on upper surface, with stalked or sessile glands towards apex and a part of elongated slender, glandular stipules at base. Flowers both fertile and sterile, in broad and on stalked compound cyme, fertile flowers beings small and green, sterile large, greenish-white and marginal. Fruit scarlet, sub-globular drupe with succulent sarcocarp and flat stony endocarp enclosing a seed.

Part used : Bark.

Macroscopical : In strips, quills or chip-like pieces, 1 to 10 cm long, 0.5 to 3 mm thick**,** thin pieces brownish-grey to greenish-yellow, thick pieces light grey or greyish-brown to greyish-black externally, greenish-brown where abraded, finely fissured, sometimes containing crooked longitudinal wrinkles and small slight coloured lenticels, internally greenish-yellow to yellow to rusty-brown, irregularly transversely to obliquely or longitudinally striated. Fracture short with few or no projecting fibres in thinner bark, short and weak in thicker bark, fractured outer-bark surface brown to rusty-brown, phelloderm green and inner bark pale brown to yellow. Odour valerian-like; taste astringent and bitter.

Microscopical : Stem: epidermis exfoliating or replaced by cork, phellogen sometimes present, primary cortex with hypodermis of large collenchymatous cells followed by parenchyma containing greenish-yellow amorphous substance, starch grains and rosette aggregates of calcium oxalate; middle cortex showing rifts in inner part; pericycle parenchyma containing rosette aggregate crystals of calcium oxalate, starch grains or amorphous substances, interspersed with isolated pericycle fibers; phloem parenchymatous, containing sieve tubes, occasional bast fibers, starch grains, crystals of calcium oxalate, amorphous contents and traversed by medullary rays, 1 to 2 cells wide. In moderately old bark, cork is 5 to 25 layered consisting of alternating zones of suberised and lignified cells and cork cambium; cortex parenchymatous containing starch grains, rosette crystals of calcium oxalate, brownish-yellow amorphous substance or chloroplast and sclerenchymatous pericyclic fibres, containing lamellared walls and ribes in between

them; phloem broad containing sieve tubes, bast fibres, sometimes starch grains, rosette of calcium oxalate and stone-cells, traversed by starch containing medullary rays, 1-2-cells wide. In fairly old bark, secondary phellogen replaces cortex pericycle and outer phloem region; cork cells tabular usually containing ridge-like thickening, tangential walls suberised; secondary phloem in irregularly oblong phloem patches, mostly containing sieve tubes, phloem parenchyma, starch grains, crystals of calcium oxalate, stone cells and traversed by numerous medullary rays.

Distribution : Southern Canada, Northern United States, Great Britain, Europe and Asia.

History and authority : Proving by H. C. Allen's assisted by Eleven provers. Hering's Guiding Symptoms, Vol. X, 459. Mentioned in Homoeopathic literature in 1858, NAJ. Hom. VI, 534 (Hale's New Rem. 3rd ed.). A Dictionary of Practical Mat. Med., Clarke Vol. III, 1535.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Viburnum Opulus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

VIBURNUM PRUNIFOLIUM
(Vib. p.)

Botanical name : *Viburnum prunifolium* Linn. **Family**: Caprifoliacea

Common names : *English:* Black haw, Nanny bush or root, Plum-leave viburnum, Stagbush, Sweet viburnum.

Description : Tall shrub or small tree, the stem and foliage glabrous or sparsely scurfy when young. Petiole slender, 5 to 12 mm long, wingless or very narrowly wing-margined. Leaves blades oblong or elliptic to obovate, rounded to apiculate or acute at apex; finely serrate obtuse to rounded at the base, those sub-tending the cyme mostly 3 to 5 cm long at anthesis, those of sterile stems eventually 6 to 8 cm long. Cyme sessile, 3-rayed or usually 4-rayed, 5 to 10 cm wide. Flowers 4 to 7 mm wide. Drupe blue-black, ellipsoid to subglobose. Stone flat, oval, scarcely, grooved.

Part used : Bark.

Macroscopical : The drug occurs in channeled or sometimes quilled pieces, 1 to 3 cm broad and seldom exceeding 4 mm in thickness. The outer surface of young bark brownish and smooth and bears whitish rounded lenticels; that of old bark is brownish-grey deeply fissured and scaly. Inner surface yellowish to reddish-brown and striated or marked with elongated reticulations. Minute glistening points are visible on the outer surface. Fracture short and granular; smoothened transverse section exhibits a narrow brown bark and a whitish cortex and phloem, in which are embedded large, yellowish groups of sclerenchyma. Odour slight; taste bitter and astringent.

Microscopical : The diagnostic characters are: numerous stone cells in ovoid masses, the abundant cluster crystals of calcium oxalate scattered throughout the cortex and phloem; numerous patches of lignified cork cells, the absence of phloem fibers, the starch grains up to 15 µ in diameter.

Distribution : Central and Eastern United States of America.

History and authority : Proved by Fowler, N. A. J. Hom. VI, 129 in 1857 (Hale's New Remedies). A Dictionary of Practical Materia Medica, Clarke, Vol. VIII, 1541.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Viburnum prunifolium in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water six parts *Strong Alcohol;* 3x and higher, with *Dispensing Alcohol.*

VIPERA TORVA
(Viper. t.)

Zoological name : *Vipera torva* Lenz, 1832 **Family**: Viperidae

Common names : German: Viper, Russell's Viper.

Description : The upper surface of the body is covered with small, imbricating, usually heeled scales. The general colour is pale brown above with 3 longitudinal series of black, light edged rings and encircling reddish spots, the under is surface yellowish-white, uniform, or with small crescentic black spots. Usual length is upto 1.6 m.

Distribution : India, Burma, Sri Lanka and Germany.

Part used : Venom; procured by compressing the gland, when the serpent is either pinioned in a frame or under the influence of chloroform.

History and authority : Short proving are mentioned in Jahr's Symptomen Codex. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1553. Boericke Mat. Med., Hering's Schlangen giftes. A. H. Z., Vol. 47, 110.

Preparation : (a) Trituration 2x Drug strength 1/10

Vipera Toprva	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, Vol. I, H.P.I.; 6x may be converted to liquid-8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol.*

Caution : Poisonous, Not to be prescribed below 6x.

VISCUM ALBUM
(Vis. alb.)

Botanical name : *Viscum album* Linn. **Family**: Loranthaceae

Common names : *Hindi*: Ban, Banda; *English*: Mistletoe; *French*: Guide Chene; *German:* Mistel.

Description : An evergreen, parasitic bush. Stem 2.5 cm in diameter, round, even, yellowish-green, jointed, with dichotomous branching. Leaves opposite or whorled, sessile, lanceolate-obtuse, entire, coriaceous and yellowish-green. Flowers both staminate and pistillate, sessile, in axillary heads in clusters of 4 to 5. Fruit, a small white glutinous, 1-seeded berry. Emits a peculiar, disagreeable odour; taste sweetish, acrid, bitter and nauseous.

Part used : Fresh leaves and berries

Microscopical : Leaves: epidermis single layered, mesophyll of isodiametric cells, in the first year of their growth, but with a single layer of palisade in the second year of growth. Stomata rubiaceous, not appreciably sunken below the level of the epidermis. Vascular bundles associated with silicified cells.

Petiole: transection through distal end possesses an arc of bundles with smaller caps of fibres.

Distribution : India (Temperate Himalayas, from Kashmir to Nepal), Europe.

History and authority : Mentioned in Homoeopathic literature in 1863 by Huber, Zeit, d. v. d. Hom. A. Cost, Vol. II, 387. Allen's Encyclop. Mat. Med., Vol. X, 154.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Viscum Album, moist magma containing solids 100 g and moisture 233 ml	333 g
Strong Alcohol	800 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with D*ispensing Alcohol*.

ZINCUM SULPHURICUM
(Zinc. sul.)

Chemical Formula : $ZnSO_4.7H_2O$ **Mol. wt.**: 287.60

Common names : Zinc sulphas, Zinc Vitriol, White vitriol, Zinc sulphate; *French*: Sulfate de Zinc; *German*: Zink sulfat, Schwefelsaures Zinkoxyd.

Description : Colourless, transparent crystals, or a white crystalline powder; odourless; taste astringent and metallic. Efflorescent in dry air. At 200º, it loses all of its *water*. Soluble in 1 part of water; insoluble in alcohol. Obtained by interaction of Zinc and Sulphuric acid. Zinc sulphate contains not less than 55.6 percent and not more than 61 percent of $ZnSO_4$ corresponding to not less than 99.5 percent and not more than the equivalent of 102.0 percent of the hydrated salt, $ZnSO_4.7H_2O$.

Identification : Yields the reactions characteristic of *Zinc* and *Sulphates*.

Reaction : A solution in water is acid to solution of litmus.

Acidity : Dissolve 1 g in 20 ml of water; the solution is acid to solution of phenol red but is not acid to solution of methyl orange.

Assay : Weigh accurately 1 g and dissolve in about 100 ml of *water*. Heat the solution to about 90º and add solution of *sodium carbonate* to precipitate all of the *zinc*, taking care to avoid a large excess of *sodium carbonate*. Boil for about five minutes and set aside to allow the precipitate to subside. Collect the precipitate in a tared Gooch crucible and wash with hot *water* until free from alkali. Dry the residue, ignite and weigh. Each g of residue equivalent to1.984 g of $ZnSO_4$.

Storage : Preserve zinc sulphate in a well closed container.

History and authority : Allen's Encyclopedia Materia Medica, Vol. X, 221. A Dictionary of Practical Materia Medica, Clarke, Vol. III, 1605.

Preparation : (a) Trituration 1x — Drug strength 1/10

Zincum Sulphuricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, Vol. I, H.P.I., 6x may be converted to liquid 8x, Vol. I, H.P.I.; 9x and higher with *Dispensing Alcohol*.

(c) Mother Solution — Drug strength 1/10

Zincum Sulphuricum in fine powder — 100 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x to 5x with purified water 6x and higher with *Dispensing Alcohol.*

Storage : *Zincum Sulphuricum,* its Mother Solution and all potencies below 6x prepared with Purified Water should be kept in well closed bottles.

ZINGIBER
(Zing.)

Botanical name : *Zingiber officinale* Roscoe **Family**: Zingiberaceae

Common names : *Hindi*: Adrak; *English*: Ginger, Jamaiea Ginger; *French*: Gingembre; *German*: Ginfer, Ing Berzahne.

Description : A perennial deciduous herb. Rhizome stout tuberous with erect leafy stems, 0.6 to 1.2 m high. Leaves, narrow distichous, subseessile on the sheaths, linear-lanceolate, 1 to 2 cm wide, glabrous. Flowers greenish with a small dark purple or purplish-black lip in radical spikes, 3.8 to 7.5 cm long and 2.5 cm in diameter on peduncles 15 to 30 cm long. Stamen, dark purple, as long as the lip, rather shorter than corolla; ovary 3-celled, ovules many.

Part used : Dried rhizome.

Macroscopical : Rhizome, laterally compressed bearing short, flattish ovate oblique branches on the upper side, each having at its apex a depressed scar; in pieces about 5 to 15 cm long, 1.5 to 6.5 cm wide (usually 3 to 4 cm) and 1 to 1.5 cm thick; externally buff coloured, showing longitudinal striations and occasional loose fibres; fractures short with projecting fibres; smoothened transverse surface exhibiting a narrow cortex (about 1/3 of the radius), a well marked endodermis and a wide stele, the whole showing numerous scattered, greyish points (fibrovascular bundles) and smaller yellowish points (secretion cells).

Microscopical : Rhizome: cortex, of isodiametric thin-walled parenchyma with scattered vascular strands and numerous isodiametric idioblasts about 40 to 80 µ in diameter, containing yellowish to reddish-brown oleoresin; endodermal cells with only the radial walls slightly thickened, free from starch; immediately inside the endodermis a row of nearly continuous collateral bundles usually without fibres; the bulk of the stele of thin-walled parenchyma tending to be arranged radially around the numerous scattered collateral vascular bundles, each consisting of a few unlignified reticulate or spiral vessels up to about 70 µ in diameter, a group of phloem cells and a group of unlignified thin-walled septate fibres upto about 30 µ wide and 600 µ long with small oblique slit like pits; numerous scattered idioblasts similar to those of the cortex and associated with the vascular bundles; prismatic idioblasts about 8 to 20 µ wide and upto about 130 µ long, singly or inaxial rows adjacent to the vessels with dark reddish-brown contents; parenchyma of cortex and stele packed with starch grains with the hilum in a terminal projection, mostly 5-15 to 30-60 µ long and upto about 25 µ wide and 7 µ thick, marked by fine transverse striations.

Distribution : Cultivated throughout India and the Tropics of Asia and America.

History and authority : Proved by Franz, Stapf & Bute. Allen's Encyclop. Mat. Med. Vol. X, 225. Hering's Guiding Symptoms, Vol. X, 562. A Dictionary of pract. Mat. Med., Clarke, Vol. III, 1608.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Zingiber, moist magma containing solids 100 g and moisture approx. 12.5 g	112.5 g
Strong Alcohol in sufficient quantity to make one thousand millilitres of the Mother Tincture	

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

APPENDICES

APPENDIX—XX 'A'

DETERMINATION OF ESTERS

Boil a convenient quantity of alcohol, (90 percent) thoroughly to expel carbon dioxide and neutralise it to solution of phenolphthalein. Weigh accurately about 2 g of the oil or ester and dissolve in 5 ml of the neutralise the free acid in the solution with 0.1 N alcoholic potassium hydroxide using 0.2 ml of solution of phenolphthalein as indicator. And 20 ml of 0.5 N alcoholic potassium hydroxide, attach the flask, to a reflux condenser, boil on a water-bath for one hour, add 20 ml of water and titrate the excess of alkali with 0.5 N sulphuric acid, using a further 0.2 ml of solution of phenolphthalein as indicator. Repeat the experiment with the same quantities of the same reagents in the same manner, omitting the oil or ester. The difference between the titration is equivalent to the alkali required to saponify the esters.

Each ml of 0.5 N alcoholic potassium hydroxide is equivalent to :

0.1061 g of benzyl benzoate.

0.09815 g of bornyl acetate.

0.06959 g of dibutyl phthalate.

0.1553 g of ethyl oleate.

0.03637 g of glyceryl triacetate.

0.09915 g of methyl acetate.

0.07608 g of methyl salicylate.

0.1312 g of santalyl acetate.

APPENDIX—XX 'B'

DETERMINATION OF ESTER VALUE

The ester value of a substance is the number of mg of potassium hydroxide required to neutralize the acids resulting from the complete hydrolysis of one g of substance.

The Ester Value is determined by the method described for the determination of esters, and is calculated from the following formula :-

$$\text{Ester value} = \frac{m \times 28.05}{w}$$

Where, m = volume in ml of 0.5 N alcoholic potassium hydroxide required to saponify the esters and w = weight in g of substance taken.

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MINISTRY OF HEALTH

F O R E W O R D

The Government was pleased to extend the term of the re-constituted Homoeopathic Pharmacopoeia Committee by another three years with effect from 22nd December, 1976 by their letter No. x-19018/21/76 (Homoeo.) dated 30th November 1976. The functions of the committee were further enlarged to prepare standards for the preparation of Nosodes for the inclusion in the Homoeopathic Pharmacopoeia of India. In addition, it undertook the preparation of the Homoeopathic Pharmacopoeia Codex in order to give detailed information on drugs and other pharmaceutical substances which are not properly proved and also to provide standards for the range of substances and materials that are not included in the Homoeopathic Pharmacopoeia of India as well as to supplement the information on drugs already included but which cannot be listed in the Homoeopathic Pharmacopoeia of India. This reconstituted committee held four meetings so far. After these deliberations the committee finalised the 3rd Volume of the H.P.I. which consists of :-

(i) General Notices
(ii) Preface
(iii) Introduction
(iv) Monographs (105)
(v) Appendices.

The third volume of the Homoeopathic Pharmacopoeia is presented herewith to the Government of India.

DR. V. T. AUGUSTINE
Secretary
Homoeopathic Pharmacopoeia Committee

NEW DELHI
November, 1978

DR. JUGAL KISHORE
Chairman
Homoeopathic Pharmacopoeia Committee

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PREFACE

The Government of India constituted the Homoeopathic Pharmacopoeia Committee in 1962 for the purpose of preparing the Homoeopathic Pharmacopoeia of India with a view to provide standards for the commonly used homoeopathic medicines. This committee did the preliminary work in preparing a comprehensive list of possible homoeopathic medicines and drafted the general notices and general instructions for the Pharmacopoeia. It also prepared 180 monographs comprising the first volume which has since been published.

The Government of India in their letter No. F. I-3/HPC, dated 22nd December, 1971, reconstituted the Homoeopathic Pharmacopoeia Committee, which had prepared one hundred monographs for the volume II of Homoeopathic Pharmacopoeia of India and the same has since been published.

The Government of India further extended the term of this reconstituted Homoeopathic Pharmacopeia Committee vide their letter No. 19018/21/76 (Homoeo.) dated 30-11-1976. The members of this committee are as follows :-

1. Honorary Adviser (Homoeopathy), Government of India, Dr. Jugal Kishore — *Chairman*
2. Drugs Controller (India) — *Member*
3. Director, Central Drugs Laboratory, Calcutta — *Member*
4. Dr. J. N. Kanjilal, Homoeopathic Physician, Calcutta — *Member*
5. Dr. P. N. Varma, Officer-in-charge, Homoeopathic Pharmacopoeia Laboratory, Ghaziabad — *Member*
6. Dr. P. Pandey, Homoeopathic Physician, Meerut — *Member*
7. Dr. P. N. Mehra, Head of Botany Department of Punjab University, Chandigarh — *Member*
8. Dr. K. Prahalad, Homoeopathic Physician, Bombay — *Member*
9. Dr. H. L. Chitkara, Homoeopathic Physician, New Delhi — *Member*
10. Dr. R. K. Bhandari, Homoeopathic Manufacturing Pharmacist, Delhi — *Member*
11. Shri G. S. Bhar, Homoeopathic Manufacturing Pharmacist, Calcutta — *Member*

12. Dr. S. Rangaswamy, Professor of Organic Chemistry, University of Delhi, Delhi — *Member*

13. Dr. L.N. Mahapatra, Professor & Head of Department of Microbiology, A.I.I.M.S., New Delhi — *Member*

14. Assistant Adviser (Homoeopathy), Govt. of India, Dr. V. T. Augustine — *Member*

The Committee appointed a working group consisting of the following members to scrutinise the initial draft of monographs prepared by the staff for the 3rd Volume and also to attend to the work of the Homoeopathic Pharmacopoeia Codex :

1. Dr. P. N. Varma — *Member*

2. Dr. P. N. Mehra — *Member*

3. Shri G. S. Bhar — *Member*

4. Assistant Adviser (Homoeopathy) Government of India — *Secretary*

The working group which met 10 times and the Committee which met four times have prepared another one hundred and five monographs for the 3rd Volume of the Homoeopathic Pharmacopoeia of India. The Government of India, Ministry of Health and Family Welfare (Department of Health) takes this opportunity to record their appreciation of the work done by the Committee and staff engaged on this work.

Dr. B. S. Ahuja (Botanist) and Dr. S. P. Singh (Research Officer, Homoeopathy) assisted the Homoeopathic Pharmacopoeia Committee.

I N T R O D U C T I O N

The first and second volume of the Homoeopathic Pharmacopoeia of India prescribing official standards for 180 and 100 drugs respectively were finalised and have since been published in 1970 and 1974. The 3rd volume covers one hundred and five Homoeopathic drugs. The Committee considered that it is necessary to make certain amendments in the general notices and general instructions contained in the first volume and second volume. These amendments are given under general notices of this volume. These are applicable to the contents of the first and second volume also. The formal revision of the text of the later will be made in the revised edition.

The material included in this volume has been freely drawn upon from the British Homoeopathic Pharmacopoeia, American Homoeopathic Pharmacopoeia, the Homoeopathic Pharmacopoeia of United States, the German Homoeopathic Pharmacopoeia and the Indian Pharmacopoeia. Wherever needed, the material has been verified and confirmed by laboratory tests undertaken in the Homoeopathic Pharmacopoeia Laboratory.

GENERAL NOTICES

The general notices, general instructions and the appendices of the first and second volume of the HPI, subject to the following amendments are applicable to the material of the first, second and third volume of the H.P.I.

The following amendments are made in the general notices and general instructions given in the first and second volume of H.P.I.

Synonyms	:	Latin names have not been mentioned.
Chemical formula	:	The words ‘chemical formula’ have been deleted from the monographs of chemical drugs.
Molecular weight	:	The words ‘Mol. Wt.’ have been added before the figures in respect of the monographs belonging to the chemical drugs.
Mother Solution	:	The sign ‘ϕ’ has been suffixed to the sub-heading “preparation”.
Caution	:	The words ‘not to be prescribed’ have been replaced by the words ‘not to be dispensed’.
Label	:	The following line is deleted from para 2 under heading ‘Label’ in the general notice of Vol. II HPI . “The state of the plant-fresh or dry used should be mentioned on the label of the Tincture.”

List of Monographs for H.P.I. Volume – III with Abbreviations

S. No.	Name of the Monograph	Abbreviation
1.	Acetanilidum	Acetan.
2.	Acidum Boracicum	Ac. boric
3.	Acidum Butyricum	Ac. butyr.
4.	Acidum Citricum	Ac. cit.
5.	Acidum Gallicum	Ac. gal.
6.	Acidum Hydrocyanicum	Asc. hcyan.
7.	Acidum Lacticum	Ac. lact.
8.	Acidum Nitro Muriaticum	Ac. n.m.
9.	Acidium Oxalicum	Ac. oxal.
10.	Acidum Sulphurosum	Ac. sulphuros.
11.	Acidum Tannicum	Ac. tan.
12.	Acidum Tartaricum	Ac. tart.
13.	Ammonium Benzoicum	Am. benz.
14.	Ammonium Bromidum	Am. brom.
15.	Amygdalus Amara	Amyg. am.
16.	Angustura	Angust.
17.	Anilinum	Anili.
18.	Anthemis Nobilis	Anth. n.
19.	Antimonium Sulphuratum Aureum	Ant. s. aur.
20.	Antipyrinum	Antipy.
21.	Apocynum Androsaemifolium	Ap. andro.
22.	Apomorphinum Muriaticum	Apo. mur.
23.	Argentum Muriaticum	Arg. mur.
24.	Aristolochia Serpentaria	Aris. s.
25.	Arsenicum Metallicum	Ars. met.
26.	Asclepias Tuberosa	Ascl. tub.
27.	Atropinum	Atropin
28.	Badiaga	Badiaga
29.	Balsum Peru	Bals. p.
30.	Benzenum	Benzen.
31.	Berberies Aquifolium	Berb. aq.
32.	Bismuthum Oxydatum	Bis. ox.
33.	Cadmium Sulphuratum	Cad. sulph.
34.	Caffeinum	Caffein.
35.	Calcarea Acetica	Calc. ace.
36.	Calcarea Bromata	Calc. bro.
37.	Calcarea Caustica	Cal. caus.
38.	Calcarea Hypophosphorosa	Calc. hyp.
39.	Cascarilla	Cascar.
40.	Castanea Vesca	Cast. ves.
41.	Castoreum	Castor.
42.	Chininum Muriaticum	Chin. m.

S. No.	Name of the Monograph	Abbreviation
43.	Chionanthus Virginica	Chion. v.
44.	Cimex Lectularius	Cimex. l.
45.	Cinnabaris	Cinbar.
46.	Cochlearia Armoracia	Coch. ar.
47.	Codeinum	Codein.
48.	Copaiba Officinalis	Copaiba
49.	Cornus Florida	Cor. f.
50.	Cubeba Officinalis	Cubeb. of.
51.	Cuprum Aceticum	Cup. acet.
52.	Cuprum Sulphuricum	Cup. s.
53.	Dolichos	Dolich.
54.	Eriodictyon Glutinosum	Erio. g.
55.	Euonymus Atropurpurea	Euony. a.
56.	Euphorbium	Euphorb
57.	Ferrum Sulphuricum	Fe. sulph.
58.	Fucus Vesiculosus	Fucus. v.
59.	Gambogia	Gambog.
60.	Gentiana Lutea	Gent. lut.
61.	Ginseng	Ginseng
62.	Granatum	Granat.
63.	Grindelia Robusta	Grind. ro.
64.	Haematoxylon Campechianum	Haemat. c.
65.	Helonias Dioica	Helon.
66.	Hydrangea Abrorescens	Hydrang.
67.	Illicium Anisatum	Illi. a.
68.	Inula	Inula
69.	Kali Chloricum	Kali. chl.
70.	Kali Oxalicum	Kali ox.
71.	Kali Permanganicum	Kali per.
72.	Kali Tartaricum	Kali tar.
73.	Lappa Major	Lap. maj.
74.	Leptandra	Leptan.
75.	Lupulus	Lupul.
76.	Murex Purpurea	Murex. p.
77.	Mygale	Mygal.
78.	Nyctanthes Arbortristis	Nyct. arb.
79.	Oleander	Oleand.
80.	Pareira Brava	Pareira
81.	Piper Methysticum	Piper. m.
82.	Piper Nigrum	Piper. n.
83.	Piscidia	Piscid.
84.	Populus Candicans	Pop. can.
85.	Prunus Virginiana	Prun. v.
86.	Rhamnus Frangula	Rham. fr.

S. No.	Name of the Monograph	Abbreviation
87.	Ricinus Communis	Ric. com.
88.	Salix Purpurea	Salix. p.
89.	Sarsaparilla	Sarsap.
90.	Scutellaria	Scutel.
91.	Senna	Senna
92.	Sinapis Alba	Sinap. al.
93.	Sinapis Nigra	Sinap. n.
94.	Squilla	Squil.
95.	Stillingia Sylvatica	Stil. syl.
96.	Symphytum Officinale	Symph. of.
97.	Taraxacum	Tarax.
98.	Taxus Baccata	Tax. Bac.
99.	Theridion	Therid.
100.	Thyroidinum	Thyroid
101.	Tongo	Tongo
102.	Triticum Repens	Trit. rep.
103.	Ustilago Maydis	Ust. m.
104.	Uva Ursi	Uva. ur.
105.	Xanthozylum Fraxineum	Xanth. f.

ACETANILIDUM

(Acetan.)

Chemical formula : C_6H_5 NH CO CH_3 **Mol. wt.**: 135.17

Common name : *English*: Antifebrin, Acetanilide.

Description : Colourless, shining, lamellar crystals; odourless; taste, slightly pungent and burning. Appreciably volatile at 95º; soluble in 185 parts of *water*.

Identification : (i) Heat 0.1 g with 2 ml of *sodium hydroxide* solution, aniline is liberated; to the mixture add 0.5 ml of *Chloroform* and warm; the unpleasant odour of *phenylisocyanide* is developed.

(ii) To about 10 ml of a saturated solution in *water*, add a few drops of *bromine solution*; a yellowish-white precipitate is formed.

(iii) Shake 2 g with 20 ml of *water* and filter, to the filtrate add a few drops of *ferric chloride* solution; no colour is produced.

Melting point : 113° to 115º H.P.I., Vol. I,

Reaction : A saturated solution in *water* is neutral to *litmus*.

Ash : Not more than 0.1 percent H.P.I., Vol. I

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. I, 120.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acetanilidum	100 mg
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I. Vol. I, ; 6x may be converted to liquid 8x, H.P.I. Vol. I, ; 9x and higher with *Dispensing Alcohol.*

ACIDUM BORACICUM

(Ac. boric)

Chemical formula : H_3BO_3 **Mol. wt.**: 61.83

Common names : *English*: Boric acid; *French*: Acide borique; *German*: Borsaure.

Description : Colourless brilliant scales or white crystals or a white crystalline powder; greasy to touch; odourless; taste slightly acid and bitter with sweetish after taste. Soluble in 18 parts of *water*, in 4 parts of boiling *water*, in 18 parts of *alcohol* , 6 parts of boiling alcohol and 4 parts in glycerin. It contains not less than 99.5 percent of H_3BO_3 with reference to the substance dried over *sulphuric acid* for five hours.

Identification : (i) Acidify a 5 percent w/v solution with *hydrochloric acid*, moisten a piece of *turmeric paper* with this solution and dry; the colour of the paper becomes pink or brownish-red. Pour dilute *ammonia solution* on the paper, the colour changes to blue or greenish-black.

(ii) Dissolve 0.1 g by gently heating in 5 ml of *methyl alcohol* to which a few drops of *sulphuric acid* have been added, ignite the solution; the flame has a green border.

(iii) Dissolve 3 g in 80 ml of boiling *water*, cool and dilute to 90 ml with *water*, the solution is acidic to *methyl red* solution.

Alcohol insoluble substances : Dissolve 1 g in 10 ml of boiling *alcohol*; the solution is not more than faintly turbid.

Reaction : pH of the solution prepared in IDENTIFICATION test (iii) 3.8 to 4.4.

Nitrates : To 4 ml of the solution prepared in the IDENTIFICATION test (iii) add 9 ml of *water* and 0.15 ml of 20 percent *sodium chloride solution* and rapidly add 6 ml of 0.1 percent *diphenyl amine solution* in *sulphuric acid*. Prepare at the same time and in the same manner, a standard using 6 ml of *nitrate standard* solution which is prepared by diluting with *water* to 100 times its volume, a solution containing *potassium nitrate* equivalent to 0.326 g of KNO_3 in 1000 ml. After 15 minutes any blue colour produced in the test solution is not deeper than that in the standard.

Sulphates : 10 ml of the solution prepared in IDENTIFICATION test (iii) diluted with *water* to 15 ml complies with the *limit test of sulphates*, H.P.I., Vol. I,

Heavy metals : 12 ml of the solution prepared in IDENTIFICATION test (iii) complies with the *limit test for heavy metals*, H.P.I., Vol. I, .

Prepare the standard using a mixture of 2.5 ml of *standard lead solution* and 7.5 ml of *water*.

Sodium : To 4 ml of the solution prepared in IDENTIFICATION test (iii) add 10 ml of *magnesium uranyl acetate solution*; the solution remains clear for at least 10 minutes.

Arsenic : Not more than 10 parts per million, H.P.I., Vol. I,

Organic matter : It does not darken on progressive heating to dull redness.

Assay : Weigh accurately about 1 g and dissolve in a mixture of 50 ml of *water* and 50 ml of *glycerin*, previously neutralized to *phenolphthalein solution*. Titrate with 1 N *sodium hydroxide* using *phenolphthalein solution* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.06183 g of H_3BO_3.

History and authority : Allen: *Encyclop. Mat. Med.,* Vol. II, 195; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. 292.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Boracicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

ACIDUM BUTYRICUM

(Ac. butyr.)

Chemical formula : $CH_3CH_2CH_2COOH$ **Mol. wt.**: 88.10

Common names : *English*: Normal Butyric acid; *German*: Butyrrous 01 saure.

Description : Oily liquid; odour, unpleasant and rancid; miscible with *water, alcohol* and *ether*. It contains not less than 98 percent of $C_2H_5CH_2CO_2H$.

Identification : (i) Evolves carbon-dioxide and sulphur dioxide on treatment with hot *sulphuric acid*.

(ii) To a weak solution in *water* add 1 ml of 5 percent *ferrous ammonium sulphate solution* containing 1 percent *sulphuric acid*, warm and make it slightly alkaline, add a few drops of *sodium nitroprusside solution*, acidify with *acetic acid*; a rose red coloration is produced.

Refractive index : at 20º, 1.399.

Specific gravity : at 20º, 0.954 to 0.959.

Assay : Take 5 ml each of sample, standard and *water* in 3 test tubes. To each one of them, add 2 ml of 10 percent *hydrogen peroxide* solution and 1 ml of 5 percent w/v *ferrous ammonium sulphate* solution. Heat on a water-bath for 5 minutes at 68° to 70º and render alkaline with 0.5 ml of 50 percent *sodium hydroxide solution*. Mix well, cool and filter out *ferric hydroxide*. To 5 ml of the filtrate of each of the above solutions, add 0.5 ml of 5 percent *sodium nitroprusside solution*, mix well. Treating solution of the third test tube as blank, measure extinction with a suitable colorimeter. Calculate butyric acid content by the formula:

$$\frac{\text{Au x 100}}{\text{As x W}}$$

where Au and As are the extinctions measured with the test solution and standard solution respectively and W is the weight per ml.

History and authority : Proved and introduced by Donald Macfarlen; also proved by William B. Griggs, Hahnemannian Monthly (1915) and Journal of A.I.H., Feb., 1916; Anshutz: New, Old and Forgetten Remedies, 73.

Preparation : (a) Mother Tincture — Drug strength 1/100

Acid Butyricum — 10 g

Dilute Alcohol (66 percent) in sufficient quantity to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 3x and higher with *Dispensing Alcohol*.

Caution : Not to be dispensed below 3x.

ACIDUM CITRICUM
(Ac. cit.)

Chemical formula : $C_6H_8O_7.H_2O$ **Mol. wt.**: 210.1

Common names : *English*: Citric acid; *French*: Acide citrique; *German*: Citronensaure.

Description : Colourless, prismatic crystals or a white powder; slightly hygroscopic and slightly efflorescent in dry air; odourless; taste strongly acid. Soluble in less than 1 part of *water* and in about 1.5 part of *alcohol.* It contains not less than 99.5 percent and not more than the equivalent of 101.0 percent of $C_6H_8O_7.H_2O$, with reference to the substance dried on silica gel to constant weight.

Identification : Yields, when neutralised, reactions characteristic of citrates, H.P.I., Vol. I,

Oxalic acid : Dissolve 1 g in 1 ml of *water* and 1 ml of *Dispensing Alcohol* and add 0.2 ml of *calcium chloride solution*, allow to stand for 1 hour; the solution remains clear.

Tartaric acid and readily carbonisable substances : Heat 1.0 g of powder with 10 ml of *sulphuric* acid on water-bath for 1 hour; not more than a straw colour is produced**.**

Ash : Not more than 0.05 percent, H.P.I., Vol. I

Assay : Dissolve about 3 g accurately weighed, in 100 ml of *water* and titrate with 1 N *sodium hydroxide* using *thymol blue solution* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.07005 g of $C_6H_8O_7.H_2O$.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 532.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Acidum Citricum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration 1x — Drug strength 1/10

Acidum Citricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Storage : 3x and below to be stored in a well-closed container.

ACIDUM GALLICUM

(Ac. gal.)

Chemical formula : $C_7H_6O_5 . H_2O$ **Mol. wt.**: 188.06

Common names : *English*: Gallic acid; 3,4,5-Trihydroxybenzoic acid; *French*: Acide gallique; *German*: Gallussaure.

Description : White or pale yellow shining needles or a powder, odourless taste, faintly acid and astringent. Soluble in 85 parts of *water*, 2 parts of boiling *water* and 6 parts of alcohol. Slightly soluble in *ether*; practically insoluble in *benzene, chloroform* and *petroleum ether*. At 100º *Gallic acid* loses its *water* of crystallisation; at about 220º it melts with decomposition.

Identification : (i) A solution in *water* gives brown colour with alkalies.

(ii) A solution in *water*, with Ferric salts, gives blue colour or blue-black precipitate.

(iii) Reduces *silver nitrate* solution to its metallic state.

Sulphated ash : Not more than 0.05 percent, H.P.I., Vol. I

Sulphate : Dissolve 5 g in hot *water* and apply limit test of sulphate, H.P.I., Vol. I

Loss on drying : Loses from 7 to 10 percent when dried to constant weight at 105º.

History and authority : First proved and introduced by D. S. Kimball; Allen: *Encyclop. Mat. Med*., Vol. IV, 317; Clarke: *A Dictionary of Practical Mat. Med*., Vol, I, 795.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Gallicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

ACIDUM HYDROCYANICUM

(Ac. hcyan.)

Chemical formula : HCN **Mol. wt.**: 27.03

Common names : *English*: Hydrocyanic acid; *French*: Acide hydrocyanique; *German*: Blausaure.

Description : Solution of Acid Hydrocyanicum colourless with characteristic odour, resembling bitter almonds. Contains not less than 1.9 percent w/w and not more than 2.1 percent w/w of HCN.

Identification : (i) To 2 ml, add 1 ml of *silver nitrate solution*; a white precipitate is formed which redissolves on adding 1 ml of *potassium cyanide solution.*

(ii) To 2 ml, add 10 mg of *ferrous sulphate* and 0.05 ml of s*odium hydroxide solution*, boil and cool, acidify to *litmus paper* with dilute *hydrochloric acid*; a blue colour produced.

(iii) The solution is slightly acidic to *litmus paper*.

Assay : Mix about 5 g accurately weighed, with 5 ml of dilute *ammonia solution* and 20 ml of *water*, add 0.25 ml *potassium iodide solution* and 30 ml of *water* and titrate with 0.1 N *silver nitrate* until a permanent opalescence obtained. Each ml of 0.1 N *silver nitrate* is equivalent to 0.005405 g of HCN.

History and authority : First proved and introduced by Joerg; Allen: *Encyclop. Mat. Med*., Vol. V, 1; Hering: *Guiding Symptoms*, Vol. VI, 82.

Preparation : (a) Mother Solution ϕ Drug strength 1/100

Acidum Hydrocyanicum (2 percent solution)	500 ml
Purified Water	500 ml

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x and 4x with Purified Water; 5x with Dilute *Alcohol*: 6x and higher with *Dispensing Alcohol*.

Caution : Highly poisonous, handle carefully. All preparations upto 6x should be freshly prepared. Not to be dispensed below 6x.

ACIDUM LACTICUM
(Ac. lact.)

Chemical formula : $C_3H_6O_3$ **Mol. wt.**: 90.08

Common names : *English*: Lactic acid; *French*: Acid lactique; *German*: Milchsaure.

Description : A colourless or slightly yellow syrupy, hygroscopic liquid. Odourless or a slight but not unpleasant odour; taste, sour. Miscible with *water*, *alcohol*, in all proportions. It consists of a mixture of lactic acid and lactide. It may be obtained by the lactic fermentation of sugar. It contains not less than the equivalent of 87.5 percent w/w of $C_3H_6O_3$.

Identification : (i) Warm 1 g with 0.1 g *potassium permanganate*; odour of acetaldehyde is evolved.

(ii) To a drop, add 2 ml of *sulphuric acid*, warm until the solution is pale yellow. Cool, add 2 drops of alcoholic solution of *guiacol;* an intense red colour appears.

Specific gravity : 1.206.

Ash : Not more than 0.1 percent w/w, H.P.I., Vol. I

Reducing sugars : Dilute 1 g with 10 ml of *water*, neutralise with *sodium hydroxide solution*, add 5 ml of *potassium cupric tartrate solution* and boil; not more than a slight trace of a red precipitate is produced.

Assay : Dilute about 3 g, accurately weighed, with 50 ml of *water*, add 50 ml of 1 N *sodium hydroxide* and boil gently for 5 minutes; titrate the excess of alkali with 1 N *sulphuric acid*, using *phenolphthalein solution* as indicator. Repeat the operation without *lactic acid*. The difference between the two titrations represents the alkali required to convert lactic acid and lactide into sodium lactate. Each ml of 1 N *sodium hydroxide* is equivalent to 0.09008 g of $C_3H_6O_3$.

History and authority : First proved and introduced by Reisig and S. Swan, N. Am. J. of Hom., 1871, 569; Allen: *Encyclop. Mat. Med*., Vol. V, 478; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 231.

Preparation : (a) Mother Solution ϕ Drug strength 1/10

Acidum Lacticum 133 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x with *Dilute Alcohol*; 3x and higher with *Dispensing Alcohol.*

Storage : 3x and below to be stored in a well-closed container.

ACIDUM NITRO MURIATICUM

(Ac. n.m.)

Common names : *English*: Aqua regia; *French*: Acide chloro-azotique; *German*: Salpetersalzsaure.

Description : Yellow, fuming and highly corrosive liquid with a strong odour of *chlorine.* It is miscible with *water* in all proportions. It may be prepared by mixing *nitric acid* and *hydrochloric acid* in following proportions:

Nitric Acid	200 ml
Hydrochloric Acid	800 ml

Mix both the acids at room temperature in a suitable dish or loosely stoppered glass container. Slight evolution of gas is observed which may continue for about 15 hours. When the reaction is complete, shake the contents gently to ensure the homogenity.

Identification : (i) Acidic to *litmus paper* and afterwards bleach it.

(ii) Dissolves readily gold leaf, H.P.I., Vol. I

(iii) Liberates *iodine* when a drop of acid is added to 1 ml of an aqueous *potassium iodide solution* (1 in 5), H.P.I., Vol. I,

(iv) Yields reactions characteristic of chlorides and of nitrates, H.P.I., Vol. I, and respectively.

Non-volatile matter : Evaporate 10 ml in a tared glass or porcelain dish on a water-bath and dry to constant weight at 105º. The weight of residue not more than 3.5 mg.

History and authority : First proved and introduced by J. C. Morgan, Hahn. Month., 6 (1870); Allen: *Encyclop. Mat. Med.*, Vol. VII, 43; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 601.

Preparation : (a) Mother Solution ϕ — Drug strength 1/10

Acid Nitro Muriaticum	279 ml
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and higher, with Purified Water, to be freshly made, for immediate use only; 6x and higher with *Dispensing Alcohol*.

Caution : (i) All preparations of this acid should be kept in glass stoppered vials and in a cool dark place.

(ii) Highly corrosive. Should not be brought into contact with alcohol.

ACIDIUM OXALICUM

(Ac. oxal.)

Chemical formula : $C_2H_2O_4.2H_2O$ **Mol. wt.**: 126.1

Common names : *English*: Oxalic acid; *French*: Acide oxalique; *German*: Oxalsaure.

Description : Colourless crystals; odourless; taste strongly acid free from efflorescence. At 98º, it fuses and at 160º sublimes, partly decomposed. Soluble in 7 parts of *water*, 2 parts of boiling *water*, 2.5 parts of *alcohol*, 1.8 parts of boiling *alcohol*, 100 parts of *ether* and 5.5 parts of *glycerin*; insoluble in *benzene*, *chloroform* and *petroleum ether*. Contains not less than 99.8 percent of $C_2H_2O_4.2H_2O$ with reference to the substance dried on *silica gel* to constant weight.

Identification : (i) When heated with *sulphuric acid*, it is decomposed into carbon-dioxide and carbon monoxide.

(ii) On heating with *glycerin*, it gives carbon-dioxide and formic acid which is discernible from its characteristic odour.

(iii) Neutral or ammoniacal solution, forms white precipitate with *calcium chloride solution*. The precipitate is insoluble in *water*, soluble in dilute *hydrochloric acid*. The precipitate decolorises *potassium permanganate* solution acidified with dilute *sulphuric acid*.

Insoluble matter : Dissolve 10 g in hot *water* to produce 100 ml. The solution is colourless. Filter through a tared sintered glass crucible of G4 porosity. Wash with hot *water* and dry at 105º. The residue weighs not more than 1 mg.

Sulphated ash : Not more than 0.05 percent, H.P.I., Vol. I,

Chloride : Dissolve 2 g in 45 ml of warm *water* and add 5 ml of dilute *nitric acid* and 1 drop of *silver nitrate solution*; no opalescence is produced.

Nitrogen compounds : To 0.5 g in a semi micro-kjeldahl distillation apparatus add 50 ml of *sodium hydroxide solution nitrogen-free* and 2 g of aluminium wire. Pass steam into the distillation flask and collect any distillate in 5 ml of *water* containing 1 ml of 0.1 N *hydrochloric acid*. Continue to pass steam until the liquid boils; disconnect the steam, allow the boiling to proceed for 1 hour and then steam distil until a total volume of 50 ml is obtained during about 6 minutes. Prepare a standard in the same manner using 1.3 ml of *ammonium solution* (1ml=0.01 mg NH_4) in place of test sample. To each distillate add 2 ml of *sodium hydroxide solution ammonia-free* and 2 ml of

Nessler's reagent. Any yellow colour produced in the test is not deeper than that produced in the standard.

Sulphate : Dissolve 1 g in 50 ml of 1 N *hydrochloric acid* and apply the *limit test for sulphates*, H.P.I., Vol. I,

Calcium group and magnesium : Mix 10 g with 0 .1 g of *anhydrous sodium sulphate*, add 2 drops of *sulphuric acid*, heat gently until *oxalic acid* is volatilised and then ignite until no more fumes are produced and no unoxidised carbon left. Add 1 ml of *hydrochloric acid* to the residue and evaporate to dryness on a water-bath. Dissolve the residue by warming a mixture of 1 ml of dilute *hydrochloric acid* and 10 ml of *water*. Add 10 ml of *ammonia-ammonium chloride buffer solution* and 25 ml of strong *ammonia solution*. Titrate with 0.01 M EDTA, using *methylthymol blue* as indicator, until the blue solution becomes colourless or grey. Not more than 0.6 ml of 0.01 M EDTA required.

Iron : Dissolve 2.5 g in 30 ml of *water*, add 3 ml of dilute *sulphuric acid* and apply the *limit test for iron*, H.P.I., Vol. I. Not more than 0.5 ml of solution required to match the colour produced in the test.

Heavy metals : Mix 4.0 g with 10 mg of *anhydrous sodium carbonate*, 5 ml of *hydrogen peroxide* (100 volumes) and 0.5 ml of *nitric acid*. Heat on water-bath in a covered dish until the reaction ceases and then evaporate to dryness. Add 1 ml of *hydrochloric acid* and 0.2 ml of *nitric acid*, heat on water-bath for 15 minutes and again evaporate to dryness. Dissolve the residue by heating to boiling with a mixture of 1 ml of dilute *hydrochloric acid* and 10 ml of *water*. Cool, dilute to 40 ml with *water*, add 10 ml of dilute *ammonium hydroxide solution* and apply *limit test for heavy metals*, H.P.I., Vol. I. The limit for heavy metals not more than 5 parts per million.

Assay : Dissolve about 3 g accurately weighed in *water* and add sufficient *water* to produce 250 ml. To 25 ml of this solution, add 5 ml of *sulphuric acid*, previously diluted with a little *water* and titrate at a temperature about 70º with 0.1 N *potassium permanganate*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.006303 g of $C_2H_2O_4.2H_2O$.

History and authority : First introduced by Neidhard in 1844 and proved by Kock, Neidhard, Dubbs and Smith; Allen: *Encyclop. Mat. Med*., Vol. VII, 253; Hering: *Guiding Symptoms*, Vol. VIII, 233.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Oxalicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I. 6x may be converted to liquid 8x, H.P.I., Vol. I. 9x and higher with *Dispensing Alcohol*.

(c) Mother Tincture ϕ — Drug strength 1/10

Acidum Oxalicum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 2x and higher with *Dispensing Alcohol*.

ACIDUM SULPHUROSUM

(Ac. sulphuros.)

Chemical formula : H_2SO_3 **Mol. wt.**: 82.08

Common name : *English*: Sulphurous Acid.

Description : A colourless liquid with characteristic, suffocating odour. It may be prepared by dissolving in *water* the gas obtained from liquefied *sulphur-dioxide* or by burning *sulphur* in air and passing the resulting *sulphur-dioxide* into *water*. It contains 4.5 to 5.5 percent w/w of SO_2 corresponding to 5.76 to 7.05 percent w/w of H_2SO_3.

Identification : Yields *reactions* characteristic of sulphites, H.P.I., Vol. I.

Specific gravity : 1.025 to 1.030.

Residue on ignition : Not more than 0.10 percent w/w, H.P.I., Vol. I

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I

Lead : Not more than 10 parts per million, H.P.I., Vol. I

Assay : Mix about 1 g accurately weighed, with 25 ml of 0.1 N *iodine*, allow to stand for about 5 minutes and titrate the excess of *iodine* with 0.1 N *sodium thiosulphate*. Each ml of 0.1 N *iodine* is equivalent to 0.003203 g of SO_2.

History and authority : Proved and introduced by James Braid, Edinb. Mat., Surg, Journ Vol. 13, 1817, 353; Allen: *Encyclop. Mat. Med.*, Vol. IX, 443.

Preparation : (a) Mother Solution ϕ Drug strength 1/100

Acidum Sulphurosum	103 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 3x to 5x to be prepared in Purified Water; to be freshly made for immediate use only; 6x and higher with *Dispensing Alcohol*.

Storage : Store in well-closed, glass stoppered bottles and in a cool place.

ACIDUM TANNICUM
(Ac. tan.)

Common names : *English*: Tannic Acid; *French*: Acide tannique; *German*: Gerbsaure.

Description : Tannic acid generally obtained from the galls of various species of *Quercus* by subjection to a special fermentation and extraction with *water-saturated ether*. Yellowish-white or light brownish, glistering scales, light masses or amorphous powder. Odourless or with a faint characteristic odour; taste strongly astringent. Very soluble in *water;* freely soluble in *alcohol*; soluble in *acetone*; practically insoluble in *benzene*, *chloroform* and *ether*.

Identification : (i) A solution produces precipitates with solutions of gelatin, albumen and certain alkaloids.

(ii) A solution gives with *ferric chloride solution*, a bluish-black colour which disappears on addition of dilute *sulphuric acid* forming a yellowish-brown precipitate.

(iii) A solution is dextro-rotatory and acid to *methyl red solution*.

(iv) A solution gives yellowish-brown precipitate with *Breamer's* reagent prepared by dissolving 1 g of *sodium tungstate* and 2 g of *sodium acetate* in 10 ml of *water*.

(v) *Iodine* solution containing *tannic acid* do not react upon *starch solution*.

Gums, dextrin, sugars and salts : To 2 ml of a 20 percent w/v solution, add 2 ml of 90 percent *alcohol*, the solution remains clear; add 1 ml of *ether*, no turbidity is produced.

Loss on drying : Loses not more than 12 percent of its weight, when dried to constant weight at 105º.

Sulphated ash : Not more than 0.2 percent, H.P.I., Vol. I

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, IX, 508; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1368.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Tannicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with method, H.P.I., Vol. I ,6x may be converted to liquid 8x, H.P.I., Vol. I, 20; 9x and higher with *Dispensing Alcohol*.

(c) Mother Tincture ϕ — Drug strength 1/10

Acidum Tannicum — 100 g

Strong alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(d) Potencies: 2x and higher with *Dispensing Alcohol.*

Storage : Potencies up to 3x to be stored in amber coloured container.

ACIDUM TARTARICUM

(Ac. tart.)

Chemical formula : $C_4H_6O_6$ **Mol. wt.**: 150.10

Common names : *English*: Tartaric acid; *French*: Acide tartarique; *German*: Weinsaure.

Description : Colourless or translucent crystals or a white, fine to granular, crystalline powder. Odourless; taste strongly acid. Stable in air. Soluble in 0.8 part of *water* and 2.5 parts of *alcohol* (95 *percent*); slightly soluble in *ether*. Contains not less than 99.5 percent of $C_4H_6O_6$ calculated with reference to the substance dried at 105° to constant weight.

Identification : (i) A solution in *water* is strongly acid and dextro-rotatory.

(ii) When ignited gradually decomposes, emitting an odour resembling that of burning sugar.

(iii) A solution in *water* when neutralised, yields the reactions characteristic of tartrates, H.P.I., Vol. I

Loss on drying : Loses not more than 1.0 percent of its weight when dried to constant weight at 105°.

Residue on ignition : When ignited to constant weight yields not more than 0.05 percent of its weight.

Arsenic : Not more than 1 part per million, H.P.I., Vol. I

Copper and iron : Dissolve 2.0 g in 40 ml of *water* and add 10 ml of dilute *ammonia solution* and 5 drops of *sodium sulphide solution lead-free*, the colour produced is at most, only slightly deeper than that produced in a similar mixture containing in addition of 1 ml of *potassium cyanide solution lead-free*.

Oxalate : Neutralise 10 ml of 10 percent solution with *ammonium hydroxide solution*, add 10 ml of *calcium sulphate test solution*; no turbidity is produced.

Sulphate : To 10 ml of 1 percent solution, add 3 drops of *hydrochloric acid* and 1 ml of *barium chloride solution*; no turbidity is produced.

Heavy metals : Dissolve 2 g in 10 ml of *water* and add 1 drop *phenolphthalein solution*, followed by *ammonium hydroxide solution* until faintly pink. Add *water* to make 23 ml and add 2 ml of dilute *acetic acid*. The limit of heavy metals is not more than 10 parts per million, H.P.I., Vol. I

Sulphated ash : Not more than 0.01 percent, H.P.I., Vol. I

Assay : Dissolve about 3 g, accurately weighed, in 100 ml of *water* and titrate with 1 N *sodium hydroxide*, using *phenolphthalein solution* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.07504 g of $C_4H_6O_6$.

History and authority : First proved and introduced by Nenning; Allen: *Encyclop. Mat. Med*., Vol. IX, 548; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1381.

Preparation : (a) Trituration 1x — Drug strength 1/10

Acidum Tartaricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I 9x and higher with *Dispensing Alcohol.*

AMMONIUM BENZOICUM

(Am. benz.)

Chemical formula : $C_6H_5CO_2NH_4$ **Mol. wt.**: 139.08

Common names : *English*: Ammonium benzoate; *French*: Benzoate d'ammoniaque; *German*: Ammonium benzoat.

Description : Prismatic or lamellar crystals or crystalline powder or granular powder; colourless or white; faint odour of *benzoic acid* or of gum benzoin, taste, bitter and saline. Turns yellow on long exposure to air with loss of *ammonia.* Soluble in 5 parts of *water* at 15º, 1.2 parts in boiling *water*, 28 parts in *alcohol* and 7.8 parts in boiling *alcohol.* It may be prepared by mixing either ammonium carbonate or ammonium hydroxide with benzoic acid and subsequent crystallization. It contains not less than 98.0 percent $C_6H_5CO_2NH_4$, with reference to the substance dried on *silica gel* to a constant weight.

Identification : It gives the *reactions* characteristic of *ammonium salts,* H.P.I., Vol. I, and of benzoates, H.P.I., Vol. III

Melting point : About 198º, H.P.I., Vol. I

Reaction : A five percent solution in *water* is neutral or slightly acidic to *litmus solution*.

Arsenic : Not more than 32 parts per million, H.P.I., Vol. I

Lead : Not more than 10 parts per million, H.P.I., Vol. I

Chlorinated Compounds : Mix 2.0 g with 50 ml of *amyl alcohol* in a dry flask, add in small quantities 3 g of *sodium,* warm gently with reflex condenser till evolution of hydrogen ceases, boil for 1 hour, cool, add 50 ml *water*, 5 ml 0.1 N *silver nitrate,* 20 ml *nitric acid* and titrate with 0.1 N *sodium thiocyanate* using *ferric ammonium sulphate solution* as indicator. Not less than 4.2 ml of 0.1 N *sodium thiocyanate* is required.

Ash : Not more than 0.1 percent, H.P.I., Vol. I

Assay : Dissolve about 3 g, accurately weighed, in 50 ml *water* and neutralise the solution, if necessary with 0.1 N *hydrochloric acid* using *phenolphthalein solution* as indicator; add 50 ml of *solvent ether* and a few drops of *bromophenol blue solution* and titrate with 0.5 N *hydrochloric acid* with constant shaking until the colour of the indicator begins to change; separate the lower layer, wash the etheral layer with 10 ml of *water* and to the separated aqueous layer, add the washing and a further 20 ml of *solvent ether.* Complete the titration with the 0.5 N *hydrochloric acid* shaking

constantly. Each ml of 0.5 N *hydrochloric acid* is equivalent to 0.06958 g of $C_6H_5CO_2NH_4$.

History and authority : Proved and introduced by Wibmer; Allen: *Encyclop. Mat. Med*., Vol. I, 256; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 82.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium Benzoicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Caution : All preparations below 6x to be stored in well-closed container.

Revised Monograph Appeared in HPI Vol. IV

AMMONIUM BROMIDUM
(Amm. brom.)

Chemical formula : NH_4Br **Mol. wt.**: 97.95

Common names : *English*: Ammonium bromide; *French*: Bromure d' ammonium; *German*: Bromammonium.

Description : Colourless or white long needle like crystal. Odourless; taste saline. Hygroscopic, soluble in 1.5 parts of *water*, 30 parts of *alcohol*. It sublimes without melting. On exposure to air it burns yellow. It may be prepared by the interaction of *hydrobromic acid* and *ammonia* or by pouring slowly bromine into an excess of aqueous ammonia or by the action of ammonium carbonate on a iron bromide solution. Contains not less than 98.0 percent NH_4Br, calculated with reference to the substance dried to constant weight at 105°.

Identification : It gives reactions characteristic of *ammonium salts*, H.P.I., Vol. I and of *bromides*, H.P.I., Vol. III

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I

Barium : 0.5 g in 10 ml *water* with 1 ml dilute *sulphuric acid* produces no turbity within 5 minutes.

Iron : 0.5 g complies with a *limit test* for *iron*, H.P.I., Vol. I

Lead : Not more than 10 parts per million, H.P.I., Vol. I

Bromate : No yellow colour is produced immediately on adding dilute *sulphuric acid* to the powdered *ammonium bromide*.

Iodide : Not even a transient violet colour is seen in *chloroform* layer in a mixture of 1 in 20 *ammonium bromide* and *ferric chloride* in *chloroform*.

Chloride : In the *assay* each g requires not less than 101.1 ml and not more than 103.0 ml of 0.1 N *silver nitrate.*

Assay : Dissolve about 0.4 g accurately weighed, in 40 ml of *water* and 5 ml of *nitric acid* add 50 ml of 0.1 N *silver nitrate* and titrate with 0.1 N *Ammonium thiocynate* using *ferric ammonium sulphate solution* as indicator. Each ml of 0.1 N *silver nitrate* is equilvalent to 0.009796 g NH_4Br.

History and authority : Proved and introduced by A. M. Cushing; Allen: *Encyclop. Mat. Med*., Vol. I, 256; Hering: *Guiding Symptoms*, Vol. I, 225.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium Bromidum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Caution : All potencies below 6x are to be freshly prepared. Crude drug and potencies below 6x to stored in well-closed containers.

AMYGDALUS AMARA

(Amyg. am.)

Botanical name : *Prunus amygdalus* Batsch. var. *amara* (DC) **Family**: Rosaceae

Synonym : *Prunus communis* Arcang. var. *amara* (Schneider).

Common names : *Hindi*: Kadva Badam; *English*: Bitter almond; *French*: Amandes; *German*: Bitter Mandeln.

Description : A deciduous tree, 5 m high, with spreading branches, purplish-brown wrinkled bark. Leaves alternate, stipulate, oblong lanceolate finely serrate. Flowers reddish, glabrous, sessile, appear in March and April. Fruit a drupe, 4 cm long, downy when young; sarcocarp leathery, splits away from stone when ripe; endocarp rugged, furrowed, smooth within. Seed solitary about 2.5 cm long, compressed, pointed at the top, blunt at the lower end.

Part used : Kernel of ripe seed.

Macroscopical : Seeds: about 20 mm long, 12.5 mm wide and 8 mm thick, ovoid in shape; testa thin, brown and scurfy. One edge of the seed is more acute and the other is rounded. At the apex of the rounded edge is the linear hilum and the raphe runs from the hilum along the edge to the blunt end of the seed, where the chalaza is situated. From chalaza numerous vascular strands branch and extend towards the pointed end of the seed. Kernel: consisting of 2 large, plano-convex, oily cotyledons enclosing a stem apex and a small radicle. The thin inner membrane which comes off with the brown testa is a very thin layer of endosperm. Odour characteristic; taste bitter.

Microscopical : Lignified giant cells of the seed coat, with pitted radial and tangential walls, rectangular in outline, many having arched outer walls usually over 100 µ in diameter; beneath the epidermis is a small amount of parenchyma, next a band of collapsed tissue within that some more parenchyma and an inner epidermis consisting of polygonal tubular cells 10 µ high and containing brown contents. Aleurone grains mostly 3 to 7 µ wide and smaller proportion measuring 10 to 15 µ. Globoids and a rosette or sometimes prisms of calcium oxalate are present.

Distribution : Southern Asia, Mediterranean and warm countries. It grows wild in Sicily and Greece.

History and authority : First introduced by Hartlaub and Trinks, 1828, R.A.M.L., I, 145; Allen: *Encyclop. Mat. Med*., Vol. I, 306.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Amygdalus Amara in *coarse powder* 100 g

Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ANGUSTURA
(Angust.)

Botanical name : *Galipea officinalis* Hancock. **Family**: Rutaceae

Synonyms : *Cusparia trifoliata* Engl., *Cusparia febrifuge* DC.

Common names : *English*: Cusparia Bark; *French*: Ecorce d' angusture; *German*: Angustura-Rinde.

Description : A small tree with straight stem, irregularly branched, covered with a smooth grey bark. Leaves alternate, petiolate and composed of 3 leaflets. Leaflet oblong and pointed, smooth, glossy and vivid green, sometimes with small white spots on them. Flowers white arranged in axillary, terminal, peduncled racemes, large, on short thick densely pubescent stalks and have a peculiar nauseous smell. Fruit has five two-valved capsules, 2 or 3 of which are often abortive; 2 seeds in each capsule, round and black, one only is generally fertile.

Part used : Bark.

Macroscopical : Occurs in quills or in thin, curved or channelled pieces, often about 10 to 30 cm long, 2.5 cm wide and 2 mm thick. The outer corky layer either grey and firmly adherent or buff, spongy and easily removed by the finger nail. The inner surface is light brown finely striated and usually laminated and under a lens exhibits numerous short, longitudinal, whitish lines due to calcium oxalate crystals. Fracture short and resinous. A smoothened transverse section shows a thin, buff or grey cork, a pale brown cortex with scattered, whitish, calcium oxalate containing cells and brown narrow, radial strips of phloem containing darker brown patches of fibres separated by medullary rays which widen out slightly towards the cortex. It gives a red colour with *ferric chloride* solution. Taste bitter.

Microscopical : Small sclerenchymatous cells from the cork and phelloderm; in the cortex, the elongated cells filled with acicular crystals of calcium oxalate; the scattered, isolated or grouped phloem fibres; the secretion cells; the numerous narrow cells, each containing one elongated, prismatic crystal of calcium oxalate (up to 120 µ long), the medullary rays, 2 cells wide in the inner part, widening outwards; the small rounded starch grains about 3 to 10 µ in diameter.

Distribution : Mountains of Columbia and Venezuela.

History and authority : First proved and introduced by Hahnemann: *Mat. Med. Pura,* Vol. I, 63; Allen: *Encyclop. Mat. Med*. Vol. I, 344.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Angustura in moderately *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2X to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3X and higher with *Dispensing Alcohol*.

ANILINUM
(Anili.)

Chemical formula : $C_6H_5NH_2$ **Mol. wt.**: 93.07

Common names : *English*: Aniline; *French*: Aniline; *German*: Anilin.

Description : A colourless or pale yellow oily liquid with a characteristic odour and an aromatic burning taste, readily darkens on exposure to air and light. Miscible with 30 parts of *water*, also with *alcohol, benzene, chloroform, ether* and oils. Contains not less than 99 percent of $C_6H_5NH_2$.

Identification : (i) To a neutral or slightly alkaline solution, add a little *bleaching powder*; deep violet colour is produced.

(ii) Dissolve 1 ml in 2 ml of dilute *hydrochloric acid* with the aid of heat, cool in ice and treat with 2 ml of a 1 percent w/v *sodium nitrite solution*, add 2 ml of 2 percent w/v *ammonium sulphomate solution*, mix allow to stand for 2 minutes, add 1 ml of 0.5 percent w/v solution of N-(1-*naphthyl*) *ethylene diamine hydrochloride*, mix; magenta red colour is produced.

(iii) Dissolve a drop in dilute *hydrochloric acid*, cool the solution in a cold water-bath and add 6 drops of dilute *sodium nitrite solution* to it. Add the whole mixture to a β-*napthol solution* in dilute *sodium hydroxide*; a brilliant scarlet red colour is produced.

Wt. per ml : At 20°, 1.021 to 1.023 g.

Refractice index : At 20°, 1.585 to 586, H.P.I., Vol. I

Boiling range : Not less than 95 percent distills between 182° and 184°.

Residue on ignition : Evaporate 20 g to dryness and ignite gently, residue is not more than 0.005 percent.

Hydrocarbons : Dissolve 5 ml in a mixture of 15 ml of *hydrochloric acid* and 10 ml of *water* and cool to 10°; no turbidity is produced.

Assay : Dissolve 0.4 g in 50 ml of *glacial acetic acid* and titrate with 0.01 N *perchloric acid* using 1-*naphthol benzene* as indicator. Each ml of 0.1 N *perchoric acid* is equivalent to 0.009313 g of $C_6H_5NH_2$.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, 357; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 117.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Anilinum	100 ml

Strong Alcohol in sufficient quantity
to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Storage : To be stored in glass stoppered vials, protected from light.

ANTHEMIS NOBILIS

(Anth. n.)

Botanical name : *Anthemis nobilis* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: English Chamomile or Roman Chamomile; *French*: Fleurs de Cammomille Romaine; *German*: Romisohe Kamille.

Description : A perennial, much branched, pubescent, procumbent herb. Leaves downy, sessile, very finely dissected with linear segments. Hemi-spherical heads of white or buff coloured flowers with solid receptacle bearing paleae and numerous ligulate florets.

Part used : Flower head.

Macroscopical : Each dried flower head is hemispherical and about 12 to 20 mm in diameter. The florets are of a white or pale buff colour. Capitulum has a single row of white ligulate florets and a central group or disc of 200 to 300 yellow tubular florets arranged in closely packed series of crossing spirals upon the conical receptacle. The receptacle is about 3 mm high and 2 mm wide at the base; it is solid and pithy in texture and bears at its base two or three rows of overlapping bracts forming an involucre surrounding the whole capitulum. The involucral bracts are about 4 to 5 mm long and 1.5 mm wide. The remaining surface of the receptacle bears intersecting spiral lines of bracts or paleae in the axil of each of which a floret is situated. The paleae are about 3 to 4 mm long and 1 mm wide. The involucral bracts and the paleae are similar in construction, but bracts are somewhat coarser and larger; both are oblong-ovate and concave with blunt apex.

Ligulate floret: calyx absent; strap of corolla oblong-lanceolate, 7 to 9 mm long and 2 to 3 mm wide; tube 1.5 to 2 mm long; ovary 1 to 2 mm long and 0.3 to 0.5 mm wide; the strap terminates in three or sometimes two rounded teeth and has four principal veins; which unite by arches near the apex of the strap. Androecium absent. Ovary inferior, unilocular; style as long as the corolla tube and bifid at apex.

Tubular floret: When well developed is about 3 to 5 mm long; calyx absent, corolla yellow, tubular, with 5 rounded teeth; stamens 5, syngenesious and epipetalous; gynoecium as in ligulate floret. Odour strong aromatic; taste biter.

Microscopical : The bracts and paleae have central lanceolate thicker region and a wide scarious margin only 1-cell thick. On the outer convex surface of each are a few narrow uniseriate trichomes about 0.7 to 1 mm long, each composed of 3 to 8 very short basal cells and long terminal cell about 20 µ wide; there are also numerous small compositous glandular trichomes each consisting of a short stalk

and head of about 2 or 3 tiers of 2 cells each. Pollen of tubular floret spherical, 30 to 45 µ in diameter finely warty with spines about 3 µ long, 3 pores and 3 germinal furrows. Numerous small yellow, glistening, glandular-trichomes similar to those of bracts occur scattered over all parts of florets.

Distribution : Common in England; also found in France, Spane, Italy and some other parts of Southern Europe.

History and authority : First introduced by Berridge; Allen: *Encyclop. Mat. Med*. Vol. I, 358; Clarke: *A Dictionary of Practical Mat. Med*. Vol. I, 117.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Anthemis Nobilis in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3X and higher with *Dispensing Alcohol*.

ANTIMONIUM SULPHURATUM AUREUM

(Ant. s. aur.)

Chemical formula : Sb_2S_5 **Mol. wt.**: 400.75

Common names : *English*: Antimony penta sulphate; *French*: Sulpher d' antimonii precipte; *German*: Goldschwefel.

Description : Amorphous, orange coloured powder, gradually losing its colour by the action of air and light. Odourless; tasteless. Insoluble in *water* and *alcohol;* soluble in *hydrochloric acid*, solutions of alkali hydroxides and sulphide. Contains not less than 99 percent of Sb_2S_5 calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) On heating in a dry glass tube decomposes into sulphur and black antimonious sulphide.

(ii) Solution in *hydrochloric acid* yields the test for antimony compounds, H.P.I., Vol. I

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I

Heavy Metals : Dissolve 2.0 g in 10 ml of dilute *hydrochloric acid;* dilute to 50 ml with *water*. 20 ml of the solution neutralised with *ammonium hydroxide solution* between pH 3 to 4 and dilute to 25 ml. The limit test for heavy metals not more than 10 parts per million, H.P.I., Vol. I

Sulphate : Dissolve 2 g in 15 ml of hot *water* containing 5 ml of *hydrochloric acid* allow to cool, dilute to 20 ml with *water* and proceed as directed in *limit test for sulphates*, H.P.I., Vol. I

Chloride : Dissolve 0.5 g in 2 ml of *nitric acid* and dilute to 25 ml with *water* and proceed as directed in the *limit test for chlorides*, H.P.I., Vol. I

Assay : Dissolve about 3 g, accurately weighed in 50 ml of a mixture of equal parts of *hydrochloric acid* and *water*. Filter through a sintered glass crucible of G4 porosity and wash the residue with about 40 ml of *water*. To the combined filtrate and washings add 4 g of *sodium potassium tartrate*, shake until dissolved neutralise the solution with 5 N *sodium hydroxide*. Cool, add 20 ml of *hydrochloric acid* and 50 ml of *potassium iodide solution*. Titrate with 0.1 N *sodium thiosulphate* using *starch solution* as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.1002 g of Sb_2S_5.

History and authority : First introduced by Glauber in 1654 and proved by Mayrhoffer in 1845; Hering: *Guiding Symptoms*, Vol. I, 372; Allen: *Encyclop. Mat. Med*., Vol. III, 377.

Preparation : (a) Trituration 1x — Drug strength 1/10

Antimonium Sulphuratum Aureum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I 9x and higher with *Dispensing Alcohol*.

Storage : Store in amber coloured, well-closed container.

ANTIPYRINUM
(Antipy.)

Chemical formula : $C_{11}H_{12}N_2O$ **Mol. wt.**: 188.20

Common names : *English*: Phenazone, 2, 3-dimethyl-I-phenyl pyrazol-5-one.

Description : Colourless crystals or white crystalline powder; odourless, soluble in 1 part of *water*, *alcohol*, *chloroform* and in 50 parts of *ether.* Contains not less than 99 percent of $C_{11}H_{12}N_2O$.

Identification : (i) Mix 0.1 g with 10 ml of *water* and add 2 ml of *tannic acid solution*; a white precipitate is formed.

(ii) Mix 0.1 g with 10 ml of *water* containing 0.1 g of *sodium nitrite* and add 1 ml of dilute *sulphuric acid*; a green colour is produced.

(iii) Dissolve 2 mg in 2 ml of *water* and 0.05 ml of *ferric chloride solution*; a deep red colour is produced; add 0.5 ml of *sulphuric acid* the colour changes to light yellow.

(iv) A solution in *water* neutral to *litmus paper.*

Melting point : 111º to 113º, H.P.I., Vol. I

Sulphated Ash : Not more than 0.1 percent, H.P.I., Vol. I.

Assay : Dissolve about 0.2 g, accurately weighed, in 20 ml of 10 percent w/v solution of *sodium acetate* in *water*, add 30 ml of 0. 1 N *iodine* and allow to stand for 20 minutes with occasional shaking; add 10 ml of *chloroform*, shake until the precipitate has dissolved and titrate the excess of *iodine* with 0.1 N *sodium thiosulphate*. Repeat the procedure omitting the sample. The difference between the 2 titrations represents the amount of *iodine* required by the sample. Each ml of 0.1 N *iodine* is equivalent to 0.009412 g of $C_{11}H_{12}N_2O$.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 134.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Antipyrinum 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

(c) Trituration 1x	Drug strength 1/10
Antipyrinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration .

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I9x and higher with *Dispensing Alcohol*.

APOCYNUM ANDROSAEMIFOLIUM

(Ap. andro.)

Botanical name : *Apocynum androsaemifolium* Linn. **Family**: Apocynaceae

Common names : *English*: Spreading dog's bane; *German*: Fliegenfanger.

Description : Smooth, perennial herb, upto 90 cm in height, possessing dichotomously branched aerials stems with chiefly alternate branches. Leaves lance-ovate, ovate-oblong to lanceolate, mucronate, pale green, short petioled on main stem and sessile on branches. Flowers pink or pinkish-white, bell-shaped and arranged in loose cymes. Corolla lobes recurved. Fruit consists of paired slender follicles. Underground portion consists of a horizontal woody gemmiferous root, which bears slender branching fibrous rootlets. From this gemmiferous root lateral buds arise at intervals which form vertical rhizomes. Young gemmiferous roots are produced laterally from vertical rhizomes.

Part used : Rhizome and root.

Macroscopical : Cylindrical, sometimes branched segments of rhizome and roots of varying length, upto 1.5 cm in diameter; rhizome vertical; gemmiferous root horizontal, externally, reddish-brown to brownish, longitudinally wrinkled, transversely fissured, the fissures having vertical sides extending through the bark; occasionally with few slender fibrous roots, buds or root scars and purplish thin stem bases, with fibrous bark and hollow centre; fracture short internally, bark thin and very pale orange to light yellowish-brown, upto 3 mm thick, readily separating from the yellowish porous and radiate wood. Odour indistinct; taste bitter and acrid.

Microscopical : Gemmiferous root: cork of 5 to 15 layers of tangentially elongated cells with slightly lignified walls. Cortex, a zone of starch bearing parenchyma numerous thick-walled, tubular latex cells upto 208 µ in diameter. Groups of stone cells always occur in this region. Phloem, a narrow zone separated into oblong phloem patches by narrow phloem rays, the latter 1 to 3 cell wide. Each phloem strand consists of phloem parenchyma, sieve tissue and latex cells. Cambium of meristematic cells. Xylem, a broad zone of narrow wood wedges, separated by narrow xylem rays. The wood wedges contain numerous wood fibres and large tracheids with simple pits and bordered pores. Rhizome shows in addition to the above numerous small strands of intraxylary phloem on the inner face of the xylem and a central pith composed of parenchyma, containing starch, resin and scattered latex cells. Stone cells present in the pith. Pericycle fibres occur in the upper part of the rhizome and throughout the aerial stems.

Powdered drug: light yellowish-brown with saponaceous odour; numerous starch grains up to 20 μ in diameter, spherical, ellipsoidal, ovate, pyriform or irregular and showing distinct polarization crosses, sometimes altered, swollen and with a central hyaline cleft; numerous fragments of lignified porous wood fibres associated with tracheids possessing bordered pores and simple pits; fragments of reddish-brown cork tissue; fragments of latex and parenchyma containing latex tubes; stone cells isodiametric or elongated with strongly lignified, thick-walls and branching pit canals.

Distribution : United States and Canada.

History and authority : First introduced by Henery; Allen: *Encyclop. Mat. Med*. Vol. I, 424; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 146.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Apocynum Androsaemifolium in *coarse powder*	100 g
Purified water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture three parts *Purified water*, six parts *Strong Alcohol*; 8x and higher with *Dispensing Alcohol*.

APOMORPHINUM MURIATICUM

(Apo. mur.)

Chemical formula : $C_{17}H_{17}NO_2HCl.½H_2O$ **Mol. wt.**: 312.80

Common names : *English*: Apomorphine hydrochloride; *French*: Chlorhydrate d' apomorphine; *German*: Apomorphin hydrochlorat.

Description : Colourless or greyish-white, minute glistening crystals; assumes greenish tint on exposure to air and light. Odourless; taste bitter. Soluble in 50 parts of *water* and in 50 parts of *alcohol*; very slightly soluble in *chloroform.* Contains not less than 98.0 percent and not more than the equivalent of 101.0 percent of $C_{17}H_{17}NO_2HCl$, calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) Dissolve 50 mg in 5 ml of water and add a slight excess of a 5 percent w/v *sodium bicarbonate solution*; a colourless precipitate separates which rapidly becomes green. To a portion of the precipitate add *ether;* the precipitate dissolves and a purple solution is produced. To a second portion of the precipitate add chloroform; the precipitate dissolves and a blue solution is produced. To the third portion of the precipitate add alcohol, the precipitate dissolves and a green solution is produced.

(ii) A freshly prepared solution in *water* is colourless rapidly turning green on exposure to air and light.

(iii) Yields reactions characteristic of chlorides, H.P.I., Vol. I, 221, but the precipitate formed with *silver nitrate solution* darkens rapidly.

Reaction : The pH of a 1 percent w/v solution, 4.5 to 5.5.

Decomposition products : On shaking 0.1 g with 5 ml of *ether,* the solution acquires not more than a faint red colour.

Colour of solution : Dissolve by shaking gently 0.1 g in 10 ml *water, carbon-dioxide-free;* the colour of the solution when freshly prepared is not deeper than that of a solution prepared as follows:

Dissolve 5.0 g in 100 ml of *water*. To 1.0 ml of the solution add 6.0 ml of *water,* 1 ml *sodium bicarbonate solution* and 0.5 ml of 0.1 N *iodine,* allow to stand for 30 seconds, add 0.6 ml of 0.1 N *sodium thiosulphate* and dilute to 10 ml with *water*.

Specific rotation : −49° to −51°, determined in a solution containing the equivalent of 0.15 g of the *anhydrous apomorphine* in 10 ml of 0.02 N *hydrochloric acid*, H.P.I., Vol. III

Morphine : To 0.1 g, add 10 ml of dilute *hydrochloric acid* previously cooled to about 10°, shake gently and filter. To the filtrate add 2 drops of *potassium mercuri-iodide solution*; not more than a faint opalescence is produced.

Loss on drying : Loses not less than 2.5 percent and not more than 4.0 percent of its weight, when dried to constant weight at 105°.

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I

Assay : Transfer about 0.1 g, accurately weighted to a separator; add 25 ml *water, carbon dioxide-free*, add 25 ml of *ether* and rotate until solution is complete. Add 2 ml of a freshly prepared saturated *sodium bicarbonate solution* and shake the mixture. After separation, run off the lower layer into a second separator and transfer the etheral layer to a third separator. Extract the aqueous layer with four successive quantities each of 15 ml of *ether*, using the second and first separators alternately and combine the etheral extracts in the third separator. Wash the etheral solution with three quantities each of 5 ml of *water*. Extract the combined washings with 10 ml of *ether*, add the etheral extract to the main etheral solution, shake with 20 ml of 0.02 N *hydrochloric acid*, allow to separate and draw the aqueous layer. Wash the etheral layer with 2 successive quantities, each of 5 ml of *water*, add the washings to the aqueous layer and titrate with 0.02 N *sodium hydroxide*, using *methyl red solution* as indicator. Each ml of 0.02 N *hydrochloric acid* is equivalent to 0.006076 g of $C_{17}H_{17}NO_2$.HCl.

History and authority : J. B. Victor Bourgeois, de L's Apomorphine, un nouvel emetique, monograph, Paris 1874; Allen: *Encyclop. Mat. Med*., Vol. I, 427; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 149.

Preparation : (a) Mother Tincture 1x — Drug strength 1/10

Apomorphine Muriaticum equivalent to 100 g of Apomorphine	
Saccharum Lactis	900 g

to make one thousand grammes of the Mother Tincture.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Storage : All preparations below 6x to be stored in well-closed containers and protected from light.

ARGENTUM MURIATICUM
(Arg. mur.)

Chemical formula : AgCl **Mol. wt.**: 143.34

Common names : *English*: Silver chloride; *French*: Chlorure d' argent; *German*: Silberchlorid.

Description : A white, amorphous powder, turning black on exposure to light. Odourless; tasteless. Insoluble in *water* and *alcohol;* soluble in *ammonium hydroxide solution*, *sodium cyanide solution*, *sodium thiosulphate solution* and *ammonium carbonate solution*. Contains not less than 99.5 percent of AgCl calculated with reference to the substance dried to constant weight at 120º.

Identification : (i) Dissolves in *ammonium hydroxide solution* and reprecipitates on neutralisation with dilute *nitric acid*.

(ii) On heating with *manganese dioxide* and *sulphuric acid*, yields *chlorine* recognisable by its odour and by giving a blue colour with *potassium iodide* and *starch solution*.

(iii) An organic aldehyde displaces silver from the *ammoniacal solution of silver chloride* and *silver mirror* is formed.

Insoluble matter in ammonium hydroxide : Weigh accurately about 2 g, transfer to a beaker. Add 20 ml of *water* and 1 ml of *nitric acid*, mix and heat for 10 minutes on a water-bath. Add 5 ml of *ammonium hydroxide solution*, stir well, cover the beaker and heat at 70° to 80°, adding more of *ammonium hydroxide solution* if necessary until no more dissolves. Filter through a small sintered glass crucible of G4 porosity and wash with small volumes of *water* containing 1 percent *ammonium hydroxide solution*. Dry at 105°. The weight of the insoluble matter is not more than 1.05 percent when dried to constant weight at 105°. Retain the filtrate and washing for assay.

Soluble substances : Take about 2 g, accurately weighed and add 50 ml of hot *water* and 2 ml of *nitric acid* and stirwell. Allow to stand with frequent stirring for 1 hour, then filter and wash with a little *water*. Evaporate the filtrate and washings to dryness over water-bath. Dry at 120° for 1 hour and weigh. The weight of residue not more than 0.05 percent. Retain the residue for the test of FOREIGN HEAVY METALS.

Nitrate : To 0.5 g add 5 ml of *water*, heat on a water-bath and add *ammonium hydroxide solution*, a few drops at a time, shaking after each addition and warming if necessary, to dissolve silver chloride. Cool to room temperature, add *water* to about 20 ml and repreciatate silver chloride by addition of just sufficient, previously cooled, 25 percent *sulphuric acid*. Dilute with *water* to 25 ml and

filter. To 10 ml of the filtrate add 10 mg of *sodium chloride*, 0.2 ml of *diphenylamine solution*, add 10 ml of 25 percent *sulphuric acid*. No blue colour is produced even after standing for 1 hour.

Foreign heavy metals : Digest the residue from the test for SOLUBLE SUBSTANCES with 0.5 ml of 1 N *hydrochloric acid* and 20 ml of hot *water* for 10 minutes and dilute to 50 ml. 25 ml of the resulting solution complies with the *test of heavy metals*, H.P.I., Vol. I The limit is not more than 10 parts per million.

Iron : 25 ml of the remaining solution obtained in the test for FOREIGN HEAVY METALS complies with *the limit* test *for iron*, H.P.I., Vol. I

Assay : Completely transfer the filtrate and washings obtained from the test for INSOLUBLE MATTER IN AMMONIUM HYDROXIDE to a 200 ml volumetric flask and dilute to mark with *water* containing 1 percent *ammonium hydroxide*. Transfer 100 ml to a beaker, add 0.2 ml of *hydrochloric acid*, heat to boiling and add, while stirring, *nitric acid* until complete precipitation effected, then add 5 drops of *hydrochloric acid* and allow to stand in dark overnight. Filter through a sintered glass crucible of G4 porosity and wash the precipitate with about 50 ml of *water*. Dry to constant weight at 120°. The residue weight not less than 99.5 percent with reference to the substance dried to constant weight at 120°.

History and authority : First proved and introduced by Lembke; Allen: *Encyclop. Mat. Med*., Vol. I, 452.

Preparation : (a) Trituration 1x — Drug strength 1/10

Argentum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

ARISTOLOCHIA SERPENTARIA

(Aris. s.)

Botanical name : *Aristolochia serpentaria* Linn. **Family**: Aristolochiacae

Common names : *English*: Snake root; *French*: Serpentaire de Virginie; *German*: Virgina che Schlagenwurzel.

Description : A small perennial herb, having a short, horizontal rhizome with long, slender, rootlets. Stem branched at the base, jointed, flexuous cylindrical, fine with a reddish tinge and is generally 35 cm high. Leaves on upper part of stem, alternate, petiolate, oblong of ovate thin, cordate and acuminate. Flowers grow close to ground, have a stiff, leathery texture and dull brownish-purple colour, pedicellate having many bracts; calyx tube smooth contracted in the middle and bent in the form of letter 'S'.

Part used : Rhizome and root.

Macroscopical : Rhizome short, thin, having thin wiry interlacing roots forming little matted masses. The upper surface of the rhizome bears numerous short bases of slender aerial stem. Both rhizome and root are brittle, breaking with a short fracture. The drug has a yellowish-brown colour; odour characteristic camphoraceous; taste strong, disagreeably bitter and acrid.

Microscopical : Rhizome: whitish pith, distinctly eccentric, being nearer to the upper than to the lower surface; the xylem bundles numerous, yellow and curved; bark yellowish brown and thin.

Root: with a central slender yellow xylem and a thick white bark.

Distribution : Indigenous to the United States of America and mainly in Virginia.

History and authority : First proved and introduced by Jorg's in 1825; Allen: *Encyclop.. Mat. Med*. Vol. VIII, 659; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 168.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aristolochia Serpentaria in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ARSENICUM METALLICUM

(Ars. met.)

Chemical formula : As **At. wt.**: 74.96

Common names : *English*: Arsenic (element); *French*: Arsenic; *German*: Elementaers arsen.

Description : Grey shining, brittle metallic, looking rhombohedral crystals or amorphous powder. Tasteless. Odourless, but when rubbed in hands emits peculiar odour. Insoluble in *water* and *alcohol* on exposure to air, oxidises slowly turning black. Contains not less than 99.0 percent of As calculated with reference to the substance dried to constant weight over *phosphorous pentoxide*.

Identification : (i) When heated, burns with bluish flame giving off garlic odour and dense white fumes of *arsenic trioxide.*

(ii) Dissolve 0.5 g in 10 ml of *hydrochloric acid;* place 1 ml of the solution in a test tube containing a few grammes of *zinc* and 3 ml of a mixture of 1 part of *sulphuric acid* and 3 parts of *water*. Immediately insert cotton plug soaked with 15 percent w/v solution of *cuprous chloride* in *hydrochloric acid* and cover the test tube with filter paper impregnated with 20 percent *silver nitrate* solution: brown-black stain is obtained on the filter paper.

Residue on ignition : Slowly ignite 5 g in a platinum or silica dish in a fume cupboard; the residue weighs not more than 10 mg (0.2 percent). Retain the residue for the *test of iron*.

Organic matter : During ignition, no darkening of colour or carbonisation is produced.

Chloride : Heat 0.5 g with 5 ml of 10 percent *ammonium hydroxide solution* and 15 ml of *water* until dissolved. Cool, add 5 ml of *nitric acid*, dilute to 50 ml with *water*, 25 ml of the solution complies with the limit test for chlorides, H.P.I., Vol. I

Sulphide : Dissolve 1.0 g in 10 ml of 1 N *sodium hydroxide* and add 1 drop of *lead acetate solution*. The colour not darker than that of 10 ml of 1 N *sodium hydroxide* to which one drop of *lead acetate solution* has been added.

Antimony : Add 0.1 g in a 125 ml separating funnel containing 5 ml of a mixture of 2 parts of *hydrochloric acid* and 1 part of *water*, shake gently until dissolved. In another separating funnel containing 4 ml of a mixture of 2 parts of *hydrochloric acid* and 1 part of *water*, add a small volume of *antimony solution* corresponding to 0.002 mg of Sb and dilute with *hydrochloric acid* to 5 ml. To each separating funnel add 0.5 ml of a 10 percent *sodium nitrate*

solution and mix. Add 5 ml of *water*, 5 ml of a solution of 10 mg of *rhodamine* in 100 ml of *water* and 15 ml of *benzene*. Shake for 1 minute; allow to separate and discarding the aqueous layer. Add 10 ml of 10 percent *hydrochloric acid*, shake for 1 minute, allow to separate and discard the aqueous layer.

Transfer the benzene layers to glass stoppered cylinders of same dimensions. Rinse the separating funnels each with 5 ml of *benzene* and add the washings to the respective cylinders. Add to the cylinders 1 g of *anhydrous sodium sulphate* and sufficient *benzene* to make 25 ml and shake until liquid clear. Any violet-red colour in the cylinder with test sample not deeper than that produced in the cylinder with 0.002 mg *antimony*.

Iron : To the residue obtained from the test for RESIDUE ON IGNITION add 2 ml of *hydrochloric acid* and 2 ml of *water*; slowly evaporate to dryness on a water-bath. Dissolve the residue in 2 ml of *hydrochloric acid* and sufficient *water* to make 50 ml. Dilute 20 ml of the solution to 40 ml with *water* and proceed as directed in the *limit test for iron*, H.P.I., Vol. I

Heavy metals : To 1 g in a small procelain dish add 25 mg of *sodium carbonate*, 10 ml of *water*, 10 ml of *hydrochloric acid*. Place the porcelain dish in a fume cupboard and evaporate on a water-bath to dryness. Wash down the sides of the dish with 3 ml of *hydrochloric acid* and 3 ml of *water*. Re-evaporate on water-bath. Dissolve the residue in 1 ml of 1 N *acetic acid* and digest well with 10 ml of hot *water*. Transfer completely, with the aid of *water*, to a 50 ml Nessler's cylinder and dilute to 40 ml with *water* and proceed as per *limit test for* HEAVY METALS, H.P.I., Vol. I The limit is not more than 10 parts per million.

Insoluble matter in ammonia : Heat 5 g with 65 ml of *water* and 35 ml of *ammonium hydroxide solution* under a reflux condenser. Filter, wash the residue with warm *ammonium hydroxide solution* and dry at 105°. The residue weighs not more than 1 mg.

Assay : Weigh accurately about 0.2 g and dissolve it in a mixture of 25 ml of *water* and 5 ml of 1 N *sodium hydroxide*, warm it. Cool, render slightly acidic with dilute *sulphuric acid*, then add 40 ml of a cold saturated solution of *sodium bicarbonate* and titrate with 0.1 N *iodine*, using starch indicator. Each ml of 0.1 N *iodine* is equivalent to 0.03746 g of As.

History and authority : First introduced by Lippe, N. *Am. J. of Hom.*, I, 301; and proved by Stevenson; Allen: *Encyclop. Mat. Med.*, Vol. I, 554; Hering: *Guiding Symptoms*, Vol. II, 133.

Preparation : (a) Trituration 2x Durg strength 1/100

Arsenicum Metallicum	10 g

Saccharum Lactis 990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Storage : Store in a well-closed container.

Caution : Poison; not to be dispensed below 3x.

Revised Monograph Appeared in HPI Vol. VII

ASCLEPIAS TUBEROSA

(Ascl. tub.)

Botanical name : *Asclepias tuberosa* Linn. **Family**: Asclepiadaceae

Common names : *English*: Pleurisy Root; *French:* Racine d' asclepiade tuberouse; *German:* Knollige, Schwalbenwurzel.

Description : A perennial herb with erect, hirsute stem frequently branched at the top. Leaves alternates, sessile or short petiolate, lanceolate or oblong-lanceolate with acute or obtuse apex and rounded on cordate base. Inflorescence terminal cymes of many flowered, umbels, the peduncles of which are shorter than the leaves. Calyx small and 5-parted, corolla deeply 5 parted the segments greenish orange; corona of 5-erect, oblong orange hoods, each bearing a filiform horn; stamens with filaments united to form a tube and winged anthers; stigma flat, 5 lobed. Fruit consists of fine hairy, acuminate follicles, 2 in numbers, each containing numerous seeds.

Part used : Root.

Macroscopical : Fusiform, upto 25 cm in length and 5 cm in diameter or as transverse segments or longitudinal slices of variable lengths; externally orange brown or greyish brown, longitudinally furrowed, annulate in upper region, the crown with short, hollow stem bases and circular or elliptical scars; fracture of thicker parts, tough and uneven; of thinner parts short; inner surface whitish and showing many cavities. Odour indistinct; taste starchy, bitter and acrid.

Microscopical : Cork of tangentially-elongated and slightly lignified cells. Phellogen, of thin-walled meristematic cells. Secondary cortex, a broad zone of parenchyma cells, some of which contain starch grains, others rosette aggregates of calcium oxalate. In the outer region of this zone occurs as a closed band of stone cells, each of which has a thick, lignified wall and branching pores, phloem of narrow patches separated by wide phloem rays. Cambium, of more or less collapsed meristematic cells. Xylem, a broad zone of xylem patches composed mostly of starch and crystal-containing wood parenchyma and wood fibres, scattered amongst which are a few broad porous and scalariform trachieds. Separating xylem patches from each other are broad xylem rays, the cells of which are thin-walled and contain starch. Scrapping of the fractured surface of the drug when mounted in water, show that the starch grains are simple or 2 to many compound, the individual grains being spheroidal, polyhedral or plano-convex, with central hilum, up to 15 µ in diameter. The calcium oxalate crystals are present in the form of rosettes up to 50 µ in diameter.

Distribution : United States.

History and authority : First proved and introduced by M. A. Savory, Hale and Nicol; Allen: *Encyclop. Mat. Med.*, Vol. I, 591; Hering: *Guiding Symptoms*, Vol. II, 218.

Preparation : (a) Mother tincture ϕ — Drug strength 1/10

Asclepias Tuberosa in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ATROPINUM
(Atropin)

Chemical formula : $C_{17}H_{23}NO_3$ **Mol. wt.**: 289.19

Common names : *English*: Atropine; *French*: Atropine; *German*: Atropin.

Description : Atropine is an alkaloid, dl-hysocyamine, obtained from *Atropa, Duboisia* and other species of family Solanaceae or produced synthetically. Colourless crystals or a white crystalline powder; odourless. Soluble in 400 parts of *water*, in 3 parts of *alcohol*, in 60 parts of *ether* and in 1 part of *chloroform.* Contains not less than 99.0 percent of $C_{17}H_{23}NO_3$ with reference to the substance dried at 105° to constant weight.

Identification : (i) Add 1 mg to 4 drops of *fuming nitric acid* and evaporate to dryness on water-bath; a yellow residue is obtained. Cool the residue, add 2 ml of *acetone* and 4 drops of 3 percent w/v solution of *potassium hydroxide* in *methyl alcohol*; a deep violet colour is produced.

(ii) Dissolve 50 mg in 5 ml of *water* acidified with *hydrochloric acid* and add *gold chloride solution;* a lemon yellow, oily precipitate is formed which rapidly crystallises. The precipitate, after recrystallisation from boiling *water* acidified with *hydrochloric acid*, has a minutely crystalline character, dull, pulverulent when dry, having melting point about 136°.

(iii) To 10 mg in a porcelain basin add 1.5 ml of 2 percent w/v *mercuric chloride solution* in 60 percent *alcohol*; a yellow colour is produced which becomes red on warming gently.

Melting point : 115° to 118°, H.P.I., Vol. I

Reaction : A saturated solution in *water* is alkaline to *phenolphthalein solution*.

Optical rotation : In a 10 percent w/v solution in 90 percent alcohol, in a 2-dm tube, – 0.25° to + 0.05°, H.P.I., Vol. III

Readily oxidisable : To 5 ml of a 1 percent w/v solution in 0.05 N *hydrochloric acid* add 0.25 ml of 0.1 N *potassium permanganate solution*. The colour of *permanganate* is not completely destroyed within 5 minutes.

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I

Assay : Dissolve about 0.25 g, accurately weighed, in 5 ml of 95 percent *alcohol* previously neutralised to *methyl red solution*; add 20 ml of 0.1 N *hydrochloric acid* and titrate the excess of acid with 0.1 N *sodium hydroxide,* using *methyl red solution* as indicator. Each ml

of 0.1 N *hydrochloric acid* is equivalent to 0.02894 g of $C_{17}H_{23}NO_3$.

History and authority : First proved and introduced by Eidherz, W. S. Moffatt and Hale; Allen: *Encyclop. Mat. Med.*, Vol. I, 608; Hering: *Guiding Symptoms*, Vol. III, 255.

Preparation : (a) Trituration 1x — Drug strength 1/10

Atropinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x to and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Caution : Poison; not to be dispensed below 2x.

BADIAGA
(Badiaga)

Zoological name : *Spongila lacustris* **Family**: Spongillidae

Synonyms : *Spongia palustris, Spongila fluviatillis.*

Common names : *English*: Fresh water sponge; *French*: Eponge des fleuves; *German*: Flupschwamm.

Description : Fresh water sponge grows detached from the soil, greenish colour externally having branching ramifications from the thickness of a quill to that of a finger, resembling stag's horns, with rounded corners and ends; contains white granules, one end of which is escavated, siliceous bodies and fragments of monaxon spicules. It has Rhagon type of canal system like other higher groups, the flagellate cells are confined to certain enlargements of canals called ciliated chambers. The rest to the canals are lined by flattened cells. Internally the excurrent canals open in the paragastric cavity and extremely the incurrent canals open in characteristic subdermal cavities enclosed within thin dermal membranes, perforated by dermal pores. A sexual reproduction takes place by production of gemmules, although sexual reproduction producing typical larva occurs. The gemmules normally have cylindrical and sub-cylindrical spicules that are sharp or blunt or knobbed at ends. The gemmules either lie free in the substance of the sponge or are attached to its support. Odour disagreeable and fleshy.

Part used : Whole sponge.

Distribution : Occurs in rivers, canals and lakes mainly in Russia and Europe.

History and authority : First introduced by Hahnemann and proved by Lyman Bedford, *Hahnemannian Monthly*, II, 121, 1866; Allen: *Encyclop.Mat. Med*., Vol. II, 25; Hering: *Guiding Symptoms*, Vol. II, 307.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Dried pulverised Sponge	100 g
Strong Alcohol, in sufficient quantity.	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration 1x Drug strength 1/10

Dried pulverised Sponge	100 g
Saccharam Lactis	900 g

to make one thousand grammes of the Trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I may be converted to liquid 8x, H.P.I., Vol. I, 5x and higher with *Dispensing Alcohol*.

BALSUM PERU

(Bals. p.)

Common names : *English*: Balsam of Peru; *French*: Baume de Perou; *German*: Perubalsam.

Description : A resin, obtained from *Balsamum indicum nigrum, B. peruvianum nigrum*. Dark brown viscid liquid, transparent, appears reddish brown in thin layers, free from stickiness or stringiness; odour agreeable, balsamic, resembling vanilla; taste bitter, acrid and persisting. It does not harden on exposure to air. Miscible with *alcohol* (equal volume) and *chloroform*; partly miscible with *ether; glacial acetic acid* and light *petroleum ether*; practically immiscible with *water* (on shaking with *water,* only traces of *cinnamic acid is* removed). Contains 53 to 66 percent of a colourless aromatic oily liquid (*cinnamein*) and 20 to 28 percent of a dark resin.

Specific gravity : 1.150 to 1.170.

Solubility in alcohol : Mix 1 volume with 1 volume of *Dispensing Alcohol* a clear solution is produced which becomes turbid on addition of a further 2 volumes of Dispensing Alcohol.

Fixed oils : Shake 1.0 g with a solution of 3 g of *chloral hydrate* in 2 ml of *water;* a clear solution is produced.

Benzaldehyde and turpentine : Shake thoroughly 2 g with 10 ml of light *petroleum ether*, filter and evaporate 4 ml of the filtrate to dryness on water-bath; the residue has no odour of *benzaldehyde* or *turpentine*.

Rosin and colophony : Shake the remainder of the filtrate obtained in the test for *Benzaldehyde* and *turpentine* with twice its volume of dilute *copper acetate solution*; the *petroleum* layer is not coloured green.

Acid value : Dissolve about 1.0 g accurately weighed in 100 ml of neutralized *alcohol*, add 1 ml of *phenophthalein solution* and titrate with 0.5 N *sodium hydroxide*. The acid value not less than 56 and not more than 84.

Cinnamein : Mix about 3.0 g accurately weighed, with 30 ml of *sodium hydroxide solution* in a separator, shake the mixture for a few minutes with 100 ml of *ether* and allow to stand until complete separation into 2 layers has taken place. Draw off the lower *water* layer and quickly filter the *ether* layer into a 100 ml volumetric flask, add *ether* to volume and mix. Transfer 50 ml of the ethereal solution to a tared conical flask, evaporate the *ether* and dry the residue at 100° for 30 minutes. The weight of residue so obtained is

not less than 53 percent and not more than 66 percent of the weight of balsam represented in 50 ml of the ethereal solution.

Saponification value : Not more than 230 determined by the following method— To the residue obtained in the determination of *cinnamein* add 20 ml of 0.5 N *alcohol potassium hydroxide* and 20 ml of Dispensing Alcohol and boil under a reflux condenser for 30 minutes; cool and titrate the excess of alkali with 0.5 N *hydrochloric acid* using *phenophthalein solution* as indicator.

Assay : Boil about 2.0 g, accurately weighed, with 25 ml of 0.5 N *alcoholic potassium hydroxide* under a reflux condenser for 1 hour, remove the *alcohol* and digest the residue with 50 ml of hot *water*, until uniformly diffused. Cool the liquid and add 150 ml of *water* and 2.5 g of *magnesium sulphate*, dissolved in 50 ml of *water*, mix thoroughly and set aside for 10 minutes. Filter the liquid through a suction filter and wash the residue with 20 ml of *water*. Acidify the mixed filtrate and washings with *hydrochloric acid* and shake vigorously with successive quantities of 30 ml of solvent *ether;* mix the ethereal solutions and reject the aqueous liquid. Shake the mixed ethereal solutions vigorously with successive quantities of 20, 20, 10 and 10 ml of solution of *sodium bicarbonate*, separate the aqueous liquid and wash each aqueous liquid with the same 20 ml of solvent *ether*. Reject the ethereal liquids. Acidify the mixed aqueous solutions with *hydrochloric acid* and shake successively with 30, 20, 10 and 10 ml of *chloroform*, separate and filter each chloroform layer through a plug of cotton-wool on which a layer of *anhydrous sodium sulphate* is placed. Evaporate the chloroform, in a current of air stopping immediately when last trace of solvent is removed. Dissolve the residue by warming with 10 ml of *alcohol* previously neutralised to solution of *phenol red*, cool and titrate with 0.1 N *sodium hydroxide*, using solution *of phenol red* as indicator. Each ml of 0.1 N *sodium hydroxide* is equivalent to 0.01482 g of total balsamic acids calculated as *cinnamic acid*.

History and authority : Introduced by Lembke, N. Z. F. H. KI, XII, 41; Allen: *Encyclop. Mat. Med*., Vol. II, 30, Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 242.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Balsam Peru — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

BENZENUM
(Benzen.)

Chemical formula : C_6H_6 **Mol. wt.**: 78.11

Common name : *English*: Benzene.

Description : A clear, colourless, mobile, inflammable liquid, odour, characteristic. Insoluble in *water,* miscible with *absolute alcohol, ether, acetone, glacial acetic* acid. It burns with a luminous, smoky flame.

Boiling range : When 100 ml is distilled the difference between the temperature at which 5 ml and 95 ml of distillates are collected does not exceed 0.5; the temperature range lying between 79.5° and 80.5°.

Specific gravity : 0.876 to 0.881.

Residue on evaporation : Evaporate 115 ml on the steam-bath and dry at 105° for 30 minutes. The weight of the residue does not exceed 1.0 mg.

Sulphur compounds : Shake vigorously 10 ml with 5 ml of *sodium plumbite solution* for 15 seconds in a 50 ml glass stoppered cylinder of about 25 mm internal diameter; no discoloration is produced. Add a small quantity of *sulphur* so that most of it floats at the junction of the two liquids; shake vigorously for 15 seconds and allow to settle for 1 minute; the sulphur film remains bright yellow.

Thiophene and certain other impurities : Shake 5 ml with 5 ml of *sulphuric acid* for 2 minutes, allow to stand for 10 minutes, the acid layer is clear and not more deeply coloured than a solution of 1 g of *potassium dichromate* in 100 ml of a mixture of equal volumes of *sulphuric acid* and *water*.

History and authority : First proved and introduced by J. Hober Smith, N. E. Med. Gaz., 1870; Allen: *Encyclop. Mat. Med*., Vol. II, 129; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 270.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Benzenum	100 g
Strong Alcohol (dehydrated) in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Storage : 3x and below to be stored in a well-closed container.

Revised Monograph Appeared in HPI Vol. X

BERBERIS AQUIFOLIUM

(Berb. aq.)

Botanical name : *Berberis aquifolium* Pursh. **Family**: Berberidaceae

Common names : *English*: Rocky Mountain Grape: *French:* Vinettier: *German*: Gemeiner Sauardorn.

Description : A shrub from 0.9 to 1.8 m in height, with smooth stem and yellow wood. Leaflet 5 to 9 oblong or ovate, dark green and lustrous above, spinulose dentate, 3.5 to 8.0 cm long; racemes erect, fascicled. Berries blue and small.

Part used : Root.

Macroscopical : Occurs in the form of simple or branched cylindrical segments of variable length up to 45 mm in diameter; usually splitting somewhat on drying; externally light yellowish brown to pale olive, longitudinally wrinkled, short-scaly and showing small irregular fissures in the cork; fracture hard and tough; internally showing a thin brownish green soft bark about 1 mm in thickness, easily separable into layers, a broad light yellow to light greenish-yellow wood, becoming deeper yellow upon wetting and exhibiting numerous curved xylem rays and showing annular rings and no pith. Odour slight; taste bitter and colours the saliva yellow on chewing.

Microscopical : Cork: a narrow irregular zone of brownish, somewhat collapsed cells. Cork cambium also of somewhat collapsed cells. Cortex of only a few layers of tangentially elongated parenchyma cells with yellowish amorphous contents. Numerous radially elongated open collateral fibrovascular bundles arranged in a circle and separated by starch-containing curved xylem rays which are for the most part narrow; each bundle consists of an outer phloem composed of alternating horizontal groups of bast fibres and soft bast, a cambium of more or less collapsed cells and a very broad, porous xylem composed of numerous wood fibres intermingled with pitted reticulate tracheids.

Distribution : Western United States, especially abundant in northern part of Pacific coast.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 278; Blackwood: *Mat. Med. Therapeutics and Pharmacology*, 178.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Berberis Aquifolium in *coarse powder* 100 g

Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

BISMUTHUM OXYDATUM
(Bis. ox.)

Chemical formula : Bi_2O_3 **Mol. wt.**: 466.00

Common names : *English*: Oxide of bismuth; *French*: Oxyde de bismuthi; *German*: Wismuthoxyd.

Description : Lemon-yellow, odourless, tasteless powder or rhombic or cubic crystals. Insoluble in *water* and *alcohol*; soluble in *hydrochloric acid* and *nitric acid.* Contains not less than 99.0 percent of Bi_2O_3 calculated with reference to the substance dried at 120° to constant weight.

Identification : (i) Dissolve 0.5 g in 5 ml of *hydrochloric acid*. Mix 1 ml of solution with 1 ml of satured *lead chloride solution* and 2 ml of reagent, freshly prepared by mixing equal volumes of 24 percent *sodium hydroxide* and a solution of 5 g *stannous chloride* in 100 ml of 1:20 *hydrochloric acid*; black to brown precipitate is formed.

(ii) 1 ml of the solution prepared for test (i) on addition of 1 ml *nitric acid* and 5 ml of *potassium iodide solution* forms yellow precipitate which soluble in excess of *potassium iodide solution.*

Residue on ignition : Loses not more than 1 percent on ignition H.P.I., Vol. I

Insoluble matter : Dissolve 5 g in a mixture of 45 ml of *water* and 5 ml of *nitric acid*. The solution should be colourless. Filter through a sintered glass crucible of G4 porosity. Wash the residue with *water*. Dry at 105°. The residue is not more than 1 mg.

Chloride : Dissolve 1.0 g in 2 ml of dilute *nitric acid*, dilute with *water* to 50 ml and add 1 ml of *silver nitrate solution*. No opalescence is produced.

Sulphate : Dissolve 0.5 g in 50 ml of approximately *perchloric acid.* Proceed as directed in test for sulphates, H.P.I., Vol. I

Alkali and ether : Dissolve 2 g in 10 ml of dilute *nitric acid* and dilute to 100 ml. Precipitate bismuth with saturated *hydrogen sulphate solution*. Evaporate filtrate to dryness, moisten with *sulphuric acid* and ignite at 800°. The residue is not more than 1 mg.

Ammonium : To 0.4 g in a micro-Kjeldahl distillation-apparatus add 5 ml of *water* and 10 ml of *sodium hydroxide solution ammonia-free* and steam distill into 5 ml of *water* containing 1 ml of 0.1 N *hydrochloric acid*, until a total volume of 50 ml is obtained during about 6 minutes. To the distillate add 2 ml of *sodium hydroxide solution ammonia-free* and 2 ml of *potassium mercuri-iodide-alkaline solution.* Any colour produced is not deeper than that

obtained on adding 2 ml of *potassium mercuri iodide-alkaline solution* to 50 ml of *water* containing 1 ml of standard *ammonia solution*.

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I

Copper : Dissolve 0.5 g in 5 ml of dilute *hydrochloric acid* and add 2 ml of *nitric acid* and 10 ml of *water*. Adjust to pH 5 with *ammonium hydroxide solution* and add 0.5 g of *hydroxylammonium chloride* and 5 ml of 0.1 percent w/v solution of 2, 9-*dimethyl*-1, 10-*phenanthroline* in *alcohol*, allow to stand for 15 minutes and extract with 5 ml of *chloroform.* The colour of *chloroform layer* is not deeper than that obtained when 1 ml of *copper standard solution* is taken in place of the test sample.

Iron : Dissolve 1 g in 4 ml of dilute *hydrochloric acid* and add this solution slowly, with stirring, to a solution of 5 g of *sodium tartrate* in 30 ml of *water*. Add 0.1 g of *L-ascorbic acid* and 10 ml of *1,* 10-*phenanthraline solution* and adjust pH between 4 to 6 with *ammonium hydroxide solution*. Colour produced is not deeper than that produced with 1 ml of *standard iron solution.*

Lead : Not more than 10 parts per million, H.P.I., Vol. I

Assay : Dissolve about 0.5 g accurately weighed in mixture of 5 ml of *nitric acid* and 5 ml of *water,* add a mixture of 50 ml of *water* and 20 ml of *glycerin* and 0.2 g of *sulphuric acid* and allow to stand for 5 minutes. Add 200 ml of *water* and 0.3 ml of *catechol* violet solution and if the colour becomes violet, add 1 N *sodium hydroxide* until colour changes to blue. Titrate with 0.05 M EDTA until solution becomes yellow. Each ml of 0.05 M EDTA is equivalent to 0.01165 g of Bi_2O_3.

History and authority : First proved and introduced by Hahnemann: *Materia Medica Pura*, Vol. I, 256; Allen: *Encyclop. Mat. Med*., Vol. II, 183.

Preparation : (a) Trituration 1x — Drug strength 1/10

Bismuthum Oxydatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x mat by converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

CADMIUM SULPHURATUM
(Cad. sulph.)

Chemical formula : CdS **Mol. wt.**: 144.47

Common names : *English*: Cadmium sulphide; *French*: Sulfure de cadmium; *German*: Schwefelcadmium.

Description : Light yellow or orange coloured cubic or hexagonal crystals, soluble in *hydrochloric acid* or warm dilute *hydrochloric acid* with evolution of hydrogen sulphide. Contains not less than 99.0 percent of CdS calculated with reference to the substance dried at 105° to constant weight.

Identification : Complies with identification test for *cadmium* compounds, H.P.I., Vol. III, and *sulphides*, H.P.I., Vol. III

Sulphate : Dissolve 1 g in 10 ml of dilute *nitric acid* and proceed as directed in, H.P.I., Vol. I

Arsenic : Dissolve 2.5 g in 10 ml of *hydrochloric acid arsenic-free* and apply the arsenic test, H.P.I., Vol. I. The limit for arsenic does not exceed 2 part per million.

Copper : Dissolve 1.0 g in 10 ml of dilute *nitric acid* and add 1 g of *citric acid* and make alkaline to *litmus paper* with dilute *ammonium hydroxide solution* and extract immediately by vigorous shaking for 2 minutes with 10 ml of a 0.1 percent w/v *sodium diethyl dithiocarbamate solution* in *carbon tetrachloride*. Any yellow colour produced in the organic layer is not deeper than that produced when 3 ml of standard *copper solution* is taken in place of the sample.

Iron : Dissolve 2 g in 10 ml of dilute *hydrochloric acid* by heating, cool and apply the *limit test for iron*, H.P.I., Vol. I. Not more than 1.5 ml of *standard iron solution* is required to match the colour produced in the test.

Sulphite and thiosulphate : Dissolve 1 g in 10 ml of dilute *nitric acid*, add 2 g of *zinc sulphate* dissolved in 100 ml of *water;* allow to stand for 30 minutes, filter and titrate with 0.1 N *iodine*. Not more than 0.3 ml of 0.1 N *iodine* is required.

Assay : Dissolve about 0.5 g accurately weighed, in 10 ml dilute *nitric acid*, boil, cool, make alkaline to *litmus paper* with strong *ammonium hydroxide solution*, add additional 25 ml of *strong ammonium hydroxide solution* and titrate with 0.1 M EDTA, using *methyl thymol blue* as indicator, until the blue solution becomes colourless or grey. 1 ml of 0.1 M EDTA is equivalent to 0.01445 g CdS.

History and authority : First proved and introduced by Petroz, 1854; Allen: *Encyclop. Mat. Med*., Vol. II, 330; Hering: *Guiding Symptoms*, Vol. III, 91.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cadmium Sulphate	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted into liquid 8x, H.P.I., Vol. I. 9x and higher with *Dispensing Alcohol*.

CAFFEINUM
(Caffein.)

Chemical formula : $C_8H_{10}N_4O_2.H_2O$ **Mol. wt.**: 212.20

Common names : *English*: Caffeine hydrate, caffeine; *French*: Cafeine Theine; *German*: Coffein.

Description : A white powder or white glistening needles usually matted together. Odourless; taste bitter. Efflorescent in dry air. Soluble in 50 parts of *water* and in 75 parts of *alcohol*; readily soluble in *chloroform* with the separation of water. Obtained from the dried leaves of *Camellia sinesis* (L) O. Kuntze is from certain other plants or it may be prepared by synthesis. It is the monohydrate of 1, 3, 7-*trimethylxanthine*.

Identification : (i) Dissolve 10 mg in 1 ml of *hydrochloric acid*, add 0.1 g of *potassium chlorate* and evaporate to dryness in a porcelain dish; a reddish residue remains, which becomes purple on exposure to the vapour of dilute *ammonium hydroxide solution.*

(ii) A cold saturated solution gives with *tannic acid solution* a white precipitate, which is soluble in excess of the reagent.

(iii) A cold saturated solution gives no precipitate with 0.1 N *iodine*, but on the subsequent addition of 0.1 N *hydrochloric acid*, a brown precipitate is formed.

Reaction : A saturated solution is neutral to litmus solution.

Melting point : 235° to 237°, H.P.I., Vol. I

Other alkaloids : A cold saturated solution yields no precipitate with *potassium mercuri-iodide solution*.

Loss on drying : Not less than 5.0 percent and not more than 8.5 percent of its weight, when dried to constant weight at 80°.

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I

Light absorption : Extinction of a 1 cm layer of a 0.001 percent w/v solution in 0.1 N *hydrochloric acid* at 272 μ, not less than 0.470, calculated with reference to the substance dried to constant weight at 80°, H.P.I., Vol. III

History and authority : First proved and introduced by C. G. Lehmann; Allen: *Encyclop. Mat. Med*., Vol. III, 447.

Preparation : (a) Trituration 1x Drug strength 1/10

Caffeinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I 9x and higher with *Dispensing Alcohol*.

Storage : Keep in a well-closed container.

CALCAREA ACETICA

(Calc. ace.)

Common name : Hahnemann's Acetate of Lime.

Description : Light brown coloured liquid containing about 10 percent of $C_4H_8O_5Ca$.

Obtained in the following manner : Boil well-washed oyster shells for an hour in *water*. Convert the shells to a coarse powder in a porcelain mortar without using any metallic instrument. The coarsely powdered shells are dissolved in dilute *acetic acid* with the aid of heat until complete saturation is affected. Filter, concentrate till a deep yellow coloured solution is obtained. On cooling a dark-brown mucilaginous substance precipitates after some time leaving lighter coloured liquid. The lighter coloured liquid is separated.

Identification : Solution in water after neutralisation yields reaction; characteristic of calcium and acetates, H.P.I., Vol. I

Assay : Dilute 1 ml with 150 ml of *water*, add 0.1 N *sodium hydroxide* drop-wise to make the solution just alkaline to *litmus paper*. Add 5 ml of 0.05 M *magnesium sulphate* and 10 ml of strong *ammonia-ammonium chloride buffer* solution and titrate against 0.05 M EDTA solution using *mordant black* mixture as indicator. From the volume of 0.05 M EDTA required, substract the volume of 0.05 M *magnesium sulphate* added. Each ml of the remainder is equivalent to 0.0088085 g of $C_4H_8O_5Ca$.

History and authority : Proved and introduced by Hahnemann: *Materia Medica Pura*, Vol. I, 291; Allen: *Encyclop. Mat. Med.*, Vol. II, 344.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

The Mother liquid obtained above is then diluted with Dilute Alcohol in such a proportion so that finished tincture contains 10 percent of acetate of lime. The Mother Tincture contains not less than 9.5 percent and not more than 10.5 percent of $C_4H_8O_5Ca$.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

CALCAREA BROMATA

(Calc. bro.)

Chemical formula : $CaBr_2$ **Mol. wt.**: 199.9

Common names : *English*: Calcium bromide; *French*: Bromure de calcium; *German*: Calcium bromide.

Description : A white or nearly white, granular salt, very deliquescent. Odourless; taste sharp, saline and bitter. Soluble in *water* and in *alcohol.* It melts and decomposes at red hot with evolution of bromine. It is prepared by neutralising *calcium carbonate* with *hydrobromic acid* or by the action of calcium-hydroxide on solution of iron bromide. Contains not less than 95 percent and not more than the equivalent of 102 percent of $CaBr_2$ with reference to the substance dried at 105° to a constant weight.

Identification : Yields reactions characteristic of *calcium*, H.P.I., Vol. I and of *bromide*, H.P.I., Vol. III

Barium : Dissolve 1.0 g with 1 g of *sodium acetate* in 10 ml of *water* slightly acidified with *acetic acid*; boil, cool and shake with a few drops of *potassium chromate* solution; the solution does not become opalescent within 5 minutes.

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I

Lead : Not more than 20 parts per million, H.P.I., Vol. I

Bromate : Dissolve 0.5 g in 10 ml of *water* and 1 ml of dilute *sulphuric acid*; no yellow colour is produced immediately.

Chloride : Complies with *limit test for chloride* described under Kali bromatum, H.P.I., Vol. I

Assay : Dissolve about 0.4 g accurately weighed, in 40 ml of *water* and 5 ml of *nitric acid*, add 50 ml or 0.1 N *silver nitrate* and titrate with 0.1 N *ammonium thiocyanate* using *ferric ammonium sulphate solution* as indicator and shaking vigorously as the end point approached. Correct for the amount of chloride present, as determined by the test for chloride. Each ml of 0.1 N *silver nitrate* is equivalent to 0.009995 g of $CaBr_2$.

History and authority : Introduced by Hale; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 337.

Preparation : (a) Trituration 2x Drug strength 1/100

Calcium Bromide	10 g

Saccharum Lactis 990 g

to make one thousand grammes of the trituration

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Storage : Store in well-closed container which prevent access of moisture.

CALCAREA CAUSTICA
(Cal. caus.)

Chemical formula : $Ca(OH)_2$ **Mol. wt.**: 74.09

Common names : *English*: Calcium hydroxide; *French*: Chaux hydratee; *German*: Kalkhydrat.

Description : A soft, white powder. Taste alkaline and slightly bitter. Almost entirely soluble in 600 parts of *water*; more soluble in aqueous solution of *glycerol* and of *sugars.* Contains not less than 90.0 percent of $Ca(OH)_2$ calculated with reference to substance dried at 105° at a constant weight.

Identification : A solution in *acetic acid* complies with reactions characteristic of *calcium*, H.P.I., Vol. I

Aluminium, Iron, phosphate and other matters insoluble in *hydrochloric acid* : Dissolve 2.0 g in a mixture of 10 ml of *hydrochloric acid* and 75 of ml *water*, boil to remove to carbon dioxide and make alkaline with dilute *ammonium hydroxide solution*, using methyl-red solution as indicator. Boil for 1 minute, filter and wash the precipitate with a hot 2 percent w/v *ammonium chloride solution*. Dissolve the precipitate as completely as possible by passing 20 ml of hot *hydrochloric acid* through the filter and wash the filter with sufficient hot water to adjust the volume of the solution to 50 ml. Boil the solution and make alkaline with dilute *ammonium hydroxide* solution, using *methyl red solution* as indicator. Boil for 1 minute, filter through the same filter, wash the precipitate with a hot 2 percent w/v *ammonium nitrate solution*, dry and ignite at a temperature not lower than 1000°; the residue is not more than 1 percent.

Arsenic : Not more than 4 parts per million, H.P.I., Vol. I

Heavy Metals : Not more than 10 parts per million, H.P.I., Vol. I

Chloride : 1.0 g dissolved in *water* with addition of 4 ml of *nitric acid*, complies with *limit test for chlorides*, H.P.I., Vol. I

Sulphate : 0.15 g dissolved in *water* with the addition of 3.5 ml of dilute *hydrochloric acid* complies with *limit* test for *sulphates*, H.P.I., Vol. I

Assay : Take about 3.0 g accurately weighted in a 1000 ml flask, add 10 ml of Strong Alcohol previously neutralised to *phenolphthalein solution*, shake gently and add 490 ml of a 10 percent w/v *sucrose solution*, previously neutralised to *phenolphthalein solution*. Shake vigorously for 5 minutes and then at frequent intervals during 4 hours. Filter off 250 ml and titrate with 1 N *hydrochloric acid*

using *phenolphthalein solution* as indicator. Each ml of 1 N *hydrochloric acid* is equivalent to 0.03705 g of $Ca(OH)_2$.

History and authority : First proved and introduced by A. W. Koch; Allen: *Encyclop. Mat. Med*., Vol. II, 385; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 351.

Preparation : (a) Mother Solution ϕ — Drug strength 1/1000

Calcarea Caustica	1 g
Purified Water	1000 ml

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 4x and higher with Purified Water to be freshly prepared up to 6x, higher potencies with *Dispensing Alcohol*.

Storage : Store in a well-closed container.

Caution : All preparation of this medicine up to 6x should be freshly prepared, preparations becoming turbid due to carbonic acid should be rejected.

CALCAREA HYPOPHOSPHOROSA
(Calc. hyp.)

Chemical forumula : $Ca(H_2PO_2)_2$ **Mol. wt.**: 170.20

Common names : *English*: Calcium hypoposphite; *French*: Hypophosphite de chaux; *German*: Calcium hypophosphit.

Description : White powder or lustrous crystals, odourless; taste bitter and nauseous. Soluble in 7 parts of *water;* insoluble in *alcohol.* Contains not less than 98.0 percent and not more than equivalent of 101.0 percent of $CaH_4O_4P_2$ with reference to substance dried at 105° to constant weight.

Identification : (i) Dissolve 0.25 g in 5 ml of *water*, add 2 ml of dilute *sulphuric acid* and 5 ml of *copper sulphate solution* and boil; a red precipitate is formed.

(ii) Dissolve 0.5 g in 10 ml of hot dilute *hydrochloric acid* and add 2 ml of *mercuric chloride* test solution; a white precipitate is formed which becomes grey on standing and on heating deposits a globule of mercury.

(iii) Gives reactions characteristic of *calcium*, H.P.I., Vol. I

Reaction : 1.0 g dissolved in 20 ml of *water carbon dioxide-free* requires for neutralisation not more than 0.5 ml of 0.1 N *sodium hydroxide*, using *phenolphthalein* solution as indicator.

Arsenic : Not more than 4 parts per million, H.P.I., Vol. I

Barium : Dissolve 1.0 g in 20 ml of *water*, filter and add an equal volume of *calcium sulphate solution*; no turbidity or precipitate is obtained.

Lead : Not more than 10 parts per million, H.P.I., Vol. I

Phosphate and other insoluble matter : Dissolve 0.5 g accurately weighed, in 50 ml of *water*, filter wash the residue with *water* and dry to constant weight at 105°. The residue not more than 0.5 percent is obtained.

Assay : Dissolve about 0.5 g accurately weighed, in 50 ml of *water* and make up the volume to 100 ml with *water*. Pipette 10 ml of this solution in a glass-stoppered flask, immediately add 50 ml of 0.1 N *bromine* and 20 ml of dilute *sulphuric acid*, shake thoroughly at the interval of 15 minutes. Allow to stand for 2 hours at 20° to 25°. Cool in ice for 5 minutes, add 30 ml of *potassium iodide solution*. Titrate with 0.1 N *sodium thiosulphate*. The operation is repeated omitting the sample. The difference between the two titrations

represents the amount of *bromine* required by the sample. Each ml of 0.1 N *bromine* is equivalent to 0.002126 g of $CaH_4O_4P_2$.

History and authority : First proved and introduced by A. R. Barrett; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 355.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Hypophosphorosa	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I; 9x and higher with *Dispensing Alcohol*.

CASCARILLA
(Cascar.)

Botanical name : *Croton eleuteria* Benn. **Family**: Euphorbiaceae

Common names : *English*: Bahama Cascarilla; *French*: Cascarille; *German*: Cascarillrinde.

Description : A small tree, up to 7 m in height. Leaves scanty, alternate, ovate-lanceolate about 5 cm long, closely scaled below giving metallic silver bronze appearance with scattered white scales above. Flowers white, fragrant, axillary, in terminal racemes, 3.7 to 5 cm long. Female flowers corolla white, villous on the margin, styles bipartite, the branches bi-fid; male flowers stamens 10 to 12. Seeds oval-oblong biconvex, opaque, blotched, 8 mm long and 6 mm broad.

Part used : Bark.

Macroscopical : Single quills or channelled pieces varying from 2.5 to 7.5 cm in length and from 4 to 12 mm in width. Outer surface of the cork chalky in appearance; it longitudinally wrinkled, chequered in places due to small transverse and longitudinal cracks; the cork easily exfoliates revealing a brown or grey-brown cortex. Inner surface is longitudinally striated and dark brown in colour. Fracture is short and resinous. Odour pleasant and aromatic; taste bitter.

Microscopical : Cork cells polygonal in surface view, lignified and showing much thickened, stratified outer wall and a thin inner one in which are embedded numerous, small prismatic crystals of calcium oxalate; the parenchyma of phelloderm, cortex and phloem containing either prismatic or cluster crystals of calcium oxalate, starch grains or droplets of oleoresin; the phloem containing also secretory cells and fibres which are isolated or in small groups, the phloem rays which are one or two cell wide; stone cells absent.

Distribution : Native of Bahamas and West Indies.

History and authority : Stapf proved and introduced in 1835; Allen: *Encyclop. Mat. Med*., Vol. III, 18.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cascarilla in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

CASTANEA VESCA
(Cast. ves.)

Botanical name : *Castanea sativa* Mill. **Family**: Fagaceae

Synonym : *Castanca vesca* Gaertn.

Common names : *English*: Chestnut; *French*: Chataigne, Marrov; *German*: Kastanie, Maronenbaum.

Description : A tall tree, 15 m in height. Leaves alternate, oblong, lanceolate, often truncate or rounded at the base, serrate, slightly pubescent or tomentose beneath. Flowers monoecious, the staminate with 6-parted calyx in long cylindrical catkins, the pistillate on lower part of the upper catkin. Fruit a large nut 2 to 5 cm wide when enclosed, prickly involucre.

Part used : Leaves.

Macroscopical : Usually folded and matted together or broken, when spread out and entire petiole about 12 mm in length; lamina oblong-lanceolate, up to 25 cm in length and 5 cm in breadth, sharp pointed at apex, acute at base, coarsely serrate along margin, the teeth being attenuated, nearly smooth, coriaceous; upper surface olive to weak olive-green; lower surface pale green; pinnately veined, the veins of the first order diverging at an angle of about 60 degree, each terminating in one of the teeth; odour slight; taste astringent.

Microscopical : Powder light olive to olive brown; few long, yellow, simple non-glandular hairs mostly up to 500 µ occasionally up to 1.5 mm in length, few stellate hairs, each formed of 3 to 8 units and spreading at the base numerous rosette aggregates and monoclinic prisms of calcium oxalate, up to 50 µ in diameter, crystal fibres containing monoclinic prisms, numerous fragments of parenchyma many with chloroplasts, others with yellow tannin masses. Transverse section of leaf with *ferric ammonium sulphate* solution turns blue.

Distribution : Europe, Eastern Asia and United States.

History and authority : First proved and introduced by Henry C. Houghton; Allen: *Encyclop. Mat. Med.*, Vol. III, 21; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 426.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Castanea Vesca in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five part *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CASTOREUM
(Castor.)

Zoological name : *Castor fiber* Linn. **Family**: Mridae

Common names : *English*: Beaver Castor; *French*: Castoreum; *German*: Bibergeil.

Description : Castor consists of the dried follicles obtained from the beaver. The follicles are situated between the anus and external genitals of both sexes of the animal, where 2 pairs of membranous sacs occur, the anterior and larger pair constituting the drug, the remaining pair being anal glands. The follicles are either dried in the sun or smoked.

Part used : Follicles.

Macroscopical : The drug occurs in dark brownish or greyish, pear-shaped massed about 8 to 10 cm long, usually in Paris, connected by a portion of the preputial or vaginal canal. The follicles are firm, heavy and solid and are divided internally into numerous cells which contain brown or reddish-brown resinous secretion which when fresh, soft and pale in colour, becoming hard and dark with age. The odour is empyreumatic and somewhat disagreeable. Russian castor is larger, fuller and heavier than the North American variety; the contents have a stronger and more agreeable odour.

Microscopical : When examined microscopically spherical grains of crystalline calcium carbonate are found in the resinous mass.

Distribution : Russia and America.

History and authority : First proved and introduced by Caspari, Nenning and Hartlaub; Allen: *Encyclop. Mat. Med*., Vol. III, 24; Hering: *Guiding Symptoms*, Vol. III, 419.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Castoreum (bruised)	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration 1x — Drug strength 1/10

Castoreum in *coarse power*	100 g
Saccharum Lactis	900 g

to make one thousand grammers of the Trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I; 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

CHININUM MURIATICUM

(Chin. m.)

Chemical forumula : $C_{20}H_{24}N_2O_2$ HCl. $2H_2O$ **Mol. wt.**: 396.90

Common names : *English*: Quinine hydrochloride; *French*: Chlorhydrate de quinine; *German*: Chinin hydrochlorid.

Description : Fine silky needles, efflorescent in dry air. Odourless; taste bitter. Soluble in 23 parts of *water* and in 0.9 part of *alcohol;* practically insoluble in *acetone.* Soluble in *chloroform*, however the solution may not be clear due to formation of droplets of *water*. Contains not less than 98 percent and not more than the equivalent of 101 percent of $C_{20}H_{24}N_2O_2$ HCI, calculated with reference to the substance dried at 105° to constant weight.

Identification : (i) To 5 ml of 0.1 percent w/v solution, add 0.2 ml of *bromine* solution and 1 ml of dilute *ammonia solution*, an emerald green colour is produced.

(ii) To a 0.5 percent w/v solution, add an equal volume of dilute *sulphuric acid*, a strong blue fluorescence is produced.

(iii) To 5 ml of 0.1 percent w/v solution, add 1 ml of dilute *ammonium hydroxide solution* and 5 ml of *ether*, shake and acidify with dilute *nitric acid*; the aqueous layer gives test for *chlorides*, H.P.I., Vol. I

Reaction : The pH of 1.0 percent w/v solution is between 6.0 to 6.8.

Barium : To a 2.0 percent w/v solution, add diluted *sulphuric acid*; no turbidity formed.

Specific rotation : Dissolve 0.5 g in 0.1 N *hydrochloric acid* and dilute to 25 ml with the same solvent. The specific rotation is between 240° to 258° calculated with reference to dried substance.

Foreign alkaloids : Dissolve 0.1 g in 2 ml of *sulphuric acid* and 2 drops of *nitric acid*; no change of colour occurs.

Other cinchona alkaloids : Dissolve 1 g in 35 ml of boiling *water* and add to the boiling solution 6 ml of *potassium chromate solution*, allow to cool for 3 hours and filter through sintered glass crucible of G4 porosity. Add to the clear filtrate 2 drops of dilute *sodium hydroxide solution*. No visible change takes place in the solution. Heat the solution on the water-bath for 1 hour and then set aside for 24 hours. The solution remains clear.

Mineral salts : Heat 1.0 g carefully to 50° with 10 ml of a mixture of 2 volumes of *chloroform* and 1 volume of *dehydrated alcohol*. The solution is clear and remains clear on cooling.

Sulphate : 0.5 g complies with limit test for Sulphates, H.P.I., Vol. I

Loss or drying : Loses not less than 6.0 percent and not more than 10.0 percent of its weight when dried to constant weight.

Sulphated ash : Not more than 0.1 percent determined on 1.0 g, H.P.I., Vol. I

Assay : Transfer about 0.5 g accurately weighed, to a separator, add 20 ml *water* and 5 ml of *sodium hydroxide solution* and extract with successive quantities, each of 10 ml of *chloroform*, until complete, extraction of the alkaloid is effected, washing each quantity of *chloroform* in succession with same 2 quantities, each of 5 ml of *water*. Transfer the *chloroform* solution to a tared vessel, remove the solvent by evaporation, add 2 ml of dehydrated *alcohol*, evaporate and dry to constant weight at 105°. Each g of residue is equivalent to 1.113 g of $C_{20}H_{24}N_2O_2$.HCl.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. III, 214; Hering: *Guiding Symptoms*, Vol. IV, 71.

Preparation : (a) Trituration 1x — Drug strength 1/10

Chininum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

CHIONANTHUS VIRGINICA
(Chion. v.)

Botanical name : *Chionanthus virginicus* Linn. **Family**: Oleaceae

Common names : *English*: Fringe Tree; *French*: Chionanthe; *German*: Schneebaum.

Description : A low deciduous, dioecious tree with opposite, petiolate, ovate to obovate-lanceolate leaves and drooping panicles of white flowers, each with 5 or 6 white linear petals. Fruit ovoid, purple drupe.

Part used : Bark.

Macroscopical : Irregularly broken, transversely curved or flat pieces, occasionally in single quills up to 10 cm long and from 2 to 10 mm in thickness; heavy, some pieces of the whole drug sinking when thrown into water; outer surface rough, usually dusky brown to light yellowish-brown, with few transverse wrinkles, scaly, roughened by shallow pits, lighter coloured cork patches and root scars; some pieces with circular, raised lenticels; inner surface moderate brown to light yellowish-orange, longitudinally striate and undulate; fracture short, hard and coarsely granular due to projecting groups of stone cells; fractured surface yellowish-white to light brown. Odour aromatic; taste bitter.

Microscopical : Cork of several layers of tangentially-elongated cells with suberized and lignified walls, a number of which contain a yellowish-brown oily substance. No stone cells occur in this region; cork cambium of meristematic cells; secondary cortex of many layers of thin-walled cortical parenchyma, the cells of which contain prismatic crystals and simple or compound starch grains. Embedded in this region are scattered groups of stone cells. Phloem a broad zone of small celled phloem parenchyma, scattered groups of sieve tubes and companion cells and nearly straight phloem rays. Embedded in this region are scattered groups of stone cells. Phloem rays are 1 to 3 cells wide.

Powdered drug: light yellowish-orange; numerous stone cells in groups and isolated with thick, lignified walls, up to 295 µ in length and 125 µ in diameter; numerous brownish, regions masses, fragments of light brown cork tissue with polygonal shaped cells; fragments of parenchyma, many of the cells filled with small prismatic crystals, some with starch; starch grains spheroidal, simple or 2 to 4 compound the individual grains mostly up to 20 µ in diameter, occasionally up to 27 µ in diameter; a few short fibers up to 220 µ in length and 45 µ in diameter with lignified, lamellated-walls with simple pores and blunt or truncated ends and representing elements of bark and a few fragments of cork cells.

Distribution : Southern United States, in north up to Pennsylvania and New Jersey.

History and authority : First proved and introduced by E. M. Hale, New Rem. 4th Ed. 209; Allen: *Encyclop. Mat. Med*., Vol. X, 463; Hering: *Guiding Symptoms*, Vol. IV, 86.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Chionanthus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	637 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CIMEX LECTULARIUS
(Cimex. l.)

Zoological name : *Acanthia lectualria* Fabr **Family**: Cimicidae

Synonym : *Cimex lectularius* Linn.

Common names : *Hindi*: Khatmal; *English*: Bed-bug.

Description : Nocturnal household pest of dark brown colour, wingless with a flat oval body, 6 to 8 mm long and 3 to 4 mm broad, inhabiting narrow crevices and hide outs where they retire during the day. The mouth parts are of piercing and sucking type. The labrum and labium are elongated to from a rostrum or beak, containing long needle-shaped styles, which are the modified mandibles and lacinia of the maxilla. The maxillary styles from the food channel. Both sexes are blood suckers. Ocelli are absent, tarsi 3 jointed, rostrum lying in a ventral groove, metamorphosis incomplete. Lays about 200 eggs in its life span. Eggs are white, recticulately sculptured with an operculum in the chorion (shell). Nymphs resemble the adult in general appearance and become adults in 2 to 8 weeks. A characteristic nauseating odour due to a secretion from the stink glands is associated with the bed bug.

Part used : Whole insect.

Distribution : Prevalent throughout the world.

History and authority : First proved and introduced by Wahle of Rome; Allen: *Encyclop. of. Med*., Vol. III, 293; Hering: *Guiding Symptoms*, Vol. IV, 141.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cimex Lectularius in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

CINNABARIS
(Cinbar.)

Chemical formula : HgS **Mol. wt.**: 232.68

Common names : *English*: Mercuric sulphide, Red sulphide of mercury; *German*: Zinnober.

Description : Brilliant scarlet red coloured heavy powder or lumps, tasteless and odourless, very soft to touch, blackens on exposure to light particularly in presence of water or alkali hydroxides. Insoluble in water and in alcohol. Dissolve in *aqua-regia*, but does not dissolve in *hydrochloric acid*, in *nitric acid.* By heating strongly, it turns dark and then volatilizes. Contains not less than 99.0 percent of HgS with reference to the substance dried at 110° to constant weight.

Identification : Dissolve 0.1 g in 10 ml of *aqua-regia* by warming and add 10 ml of water. Perform the following tests using this solution as the test solution:

(i) To 5 ml of the test solution, add 5 drops of *barium chloride* solution; a white precipitate is produced.

(ii) To 5 ml of the test solution, add 1 ml of *stannous chloride* solution; a grey precipitate is produced.

Heavy metals : Shake 0.5 g with 5 ml of dilute *nitric acid* and warm for 1 to 2 minutes. The colour of the liquid remains unchanged. After cooling filter, neutralize the filtrate with dilute *ammonium hydroxide* solution, add 2 ml of dilute *acetic acid* and sufficient *water* to make 50 ml and apply *limit test* for *heavy metals*, H.P.I., Vol. I.

Sulphur, arsenic and antimony compounds : Warm 0.5 g with 20 ml of *sodium hydroxide* solution at 60° to 70° for 5 minutes, shake and filter; the filtrate is colourless. To 5 ml of the filtrate, add 1 drop of *lead acetate* solution and to another 5 ml of the filtrate add *hydrochloric acid* to acidify; no change appears in both cases.

Loss on drying : When dried at 110° for 4 hours, loses not more than 0.2 percent of its weight.

Residue on ignition : Not more than 0.2 percent determined on 1 g, H.P.I., Vol. I.

Assay : Weigh accurately about 0.4 g previously dried at 110° for 4 hours, transfer to a 300 ml kjeldahl flask, add 10 ml of *sulphuric acid* and 10 ml of *nitric acid* and heat gently until a brown gas no larger develops. Cool, add cautiously 50 ml of *water* and add drop wise *potassium permaganate solution*, until a persisting pale red colour develops. Add drop wise *oxalic acid* solution and warm to

decolourise. Cool, add 3 ml of *nitric acid* and titrate with 0.1 N *ammonium thiocyanate* using *ferric ammonium sulphate* solution as indicator. Each ml of 0.1 N *ammonium thiocycnate* is equivalent to 0.01163 g of HgS.

History and authority : First introduced and proved by Hahnemann; Allen: *Encyclop. Mat. Med*., Vol. III, 323; Hering: *Guiding Symptoms*, Vol. IV, 203.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cinnabaris	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Storage : Preserve in well-closed containers protected from light.

COCHLEARIA ARMORACIA

(Coch. ar.)

Botanical name : *Cochlearia armoracia* Linn. **Family**: Cruciferae (Brassicaceae)

Synonyms : *Armoracia laphathifolia* Gilib., *Armoracia rusticana* Gaertn.

Common names : *English*: Horse Radish; *French*: Radis de cheval, Moustarde des moines; *German*: Meerrettig.

Description : A perennial herb, with a long conical taproot. Stem erect up to the height of 1 m. Radical leaves, long petioled, oblong crenate, occasionally pinnately incised towards base; cauline. Leaves smaller, short-petioled to sessile, lanceolate; racemes several, terminal and from the upper axils. Flowers cruciform, corolla white, petals 6 to 8 mm long. Pedicels after anthesis ascending, 8 to 12 mm long. Fruit oboviod, 2-celled up to 6 mm long but usually falling early; style about 0.3 mm long, with broad persistent stigma.

Part used : Root.

Macroscopical : Up to 30 cm in length and 1 to 5 cm in thickness, 2 to 4 cm in diameter, conical cylindrical with usually 3 or more crowns or stem bases bearing annular leaf scars at the summit; light yellowish-brown; internally white and fleshy; fracture short, the fractured surface with a thin brown cork, a white middle and inner bark, a narrow distinct cambium and a finely radiated, light coloured xylem. Odour on bruising pungent, somewhat mustard like; taste somewhat sweet, hot, pungent and acrid.

Microscopical : Cork of several layers of tangentially elongated, thin-walled suberised cells; cork cambium; secondary cortex consisting of an outer zone of 2 or 3 layers of thick-walled parenchyma and an inner broad zone of isodiametric parenchyma embedded in which are isolated groups of stone cells with lignified, porous and striated walls, the latter about 8 µ in thickness. Stone cells occur in a variety of shapes from circular to elongate-rectangular and up to 107 µ in length and 23 µ in width. Also embedded in the cortex are groups of sclerenchyma fibre. Phloem of sieve tubes, companion cells, starch bearing phloem parenchyma and phloem rays. Cambium of meristematic cells. Xylem consists of broad zone of radiate wood wedges separated by starch-bearing xylem rays. Each wood wedge shows numerous tracheids, isolated or in groups of 2 to 5 or more which are surrounded by thin-walled wood fibres or parenchyma. The tracheids as seen in radial-longitudinal section or in grated root are reticulate with truncate or oblique end walls. The parenchyma cells are up to 64 µ in width. The starch grains are single, spheroidal, reniform to oval and up to 15 µ in diameter.

Distribution : Europe and West Asia.

History and authority : Proved and introduced in 1838 by Franz. *Archiv,* XVII 3, 176; Allen: *Encyclop. Mat. Med*., Vol. III, 429; Hering: *Guiding Symptoms*, Vol. IV, 305.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cochlearia in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CODEINUM
(Codein.)

Chemical Formula : $C_{18}H_{21}NO_3.H_2O$ **Mol. wt.**: 317.4

Common names : *English*: Codeine; *French*: Codeine; *German*: Codein.

Description : Colourless crystals or white crystalline powder. Odourless; taste bitter. Soluble in 120 parts of water, 15 parts of boiling water, soluble in ether, freely soluble in alcohol, chloroform. Melting range 154° to 157°. Contains not less than 99.0 percent of $C_{18}H_{21}NO_3$ calculated with reference to the substance dried at 105° to constant weight.

Identification : (i) Dissolve about 10 mg in 5 ml of *water* and 1 ml of dilute *hydrochloric acid*. Add 1 ml of *potassium iodobismuthate solution*; an orange or orange red precipitate produced immediately.

(ii) Heat about 10 mg on water-bath with 1 ml of *sulphuric acid* and 1 drop of *ferric chloride* solution; a blue colour develops which turns to red on addition of 1 drop of *nitric acid*.

Specific rotation : Dissolve 0.5 g of dried substance in alcohol and dilute to 25 ml with the same solvent. The specific rotation should be in between 142° to 146°, H.P.I. Vol. III

Reaction and clarity of solution : Dissolve 50 mg in 10 ml of water. The solution is clear and colourless. The pH of the solution obtained in the preceding test slightly above 9.0.

Morphine : Dissolve 0.1 g in 0.1 N *hydrochloric acid* and dilute to 5 ml with the same solvent. Add 2 ml of a 1.0 percent w/v *sodium nitrite* solution; allow to stand for 15 minutes and adding 3 ml of dilute *ammonium hydroxide* solution. Any yellow to orange-yellow colour which appears not deeper than that produced when 5 ml of a 0.0025 percent w/v *morphine hydrochloride* solution treated in the same manner.

Loss an drying : Not less than 5 percent and not more than 6 percent, determined on 1 g by drying at 100º to 105º to constant weight.

Sulphated ash : Not more than 0.1 percent, determined on 1 g, H.P.I., Vol. I

Assay : Dissolve about 0.3 g accurately weighed, in 30 ml of *glacial acetic acid* and titrate against 0.1 N *perchloric acid* using *crystal violet* solution as indicator. Each ml of 0.1 N *perchloric acid* is equivalent to 29.94 mg of $C_{18}H_{21}NO_3$.

History and authority : First proved and introduced by E. E. Marcy; Allen: *Encyclop. Mat. Med.,* Vol. III, 430; Hering: *Guiding Symptoms*, Vol. IV, 305.

Preparation : (a) Trituration 1x — Drug strength 1/10

Codeinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I; 9x and higher with *Dispensing Alcohol*.

COPAIBA OFFICINALIS
(Copaiba)

Common name : *English*: Balsam of Copaiba.

Description : Copaiba is the oleo-resin obtained by incision of the trunk of *Copaifera landdorfi* Desf. and other species of *Copaifera* (Fam. Leguminosae or Fabaceae). A more or less viscous, yellow to golden-brown liquid, generally transparent and sometimes fluorescent; odour characteristic and persistent; taste slightly bitter, acrid and persistent. Copaiba contains volatile oil and resin in varying proportions. The resin obtained by on heating. Copaiba in a shallow dish until the oil has been completely dissipated a hard, brittle mass which consists chiefly of amorphous resin acids accompanied by a small quantity of crystalline resin acids and resins.

Solubility : Miscible with dehydrated *alcohol*, *ether*, *carbon disulphide*, fixed and volatile oils soluble in an equal volume of light *petroleum* (boiling point 50° to 60°), the addition of a further quantity of the solvent producing a flocculent precipitate; 3 ml added to 1 ml of dilute *ammonia solution* gives a clear solution.

Acid value : 120 to 160 calculated with reference to the residue obtained by drying on a water-bath.

Gurjam balsam : Add 4 drops of the volatile oil, obtained by distillation in steam or under reduced pressure, to a mixture of 1 drop of *nitric acid* and 3 ml of *glacial acetic acid*; no red or purple colour is produced.

Non-volatile matter : Yields, when heated on a water-bath until all the volatile oil has been driven off, 50 to 65 percent of residue.

Optical rotation : Optical rotation of the volatile oil obtained by distillation with steam under reduced pressure —7°—35°.

Weight per ml : 0.958 g to 0.993 g (at 20°).

Turpentine and other foreign matters : When heated on a water-bath, no odour of turpentine is observed and after all volatile oil has been driven off, a resin remains which, when cold, is hard and brittle.

History and authority : First proved and introduced by Hahnemann, Fragmenta de viribus Medicamentorum, 116, Teste: System dela Mat. Med.; Allen: *Encyclop. Mat. Med*., Vol. III, 554; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 392; Hering: *Guiding Symptoms*, Vol. IV, 477.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Copaiba 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

CORNUS FLORIDA
(Cor. f.)

Botanical name : *Cornus florida* Linn. **Family**: Cornaceae

Synonym : *Cynoxylon floridum* Raf.

Common names : *English*: Flowering Dogwood; *French:* Cornouiller a grandes fleurs; *German*: Grobultiger Hartriegel.

Description : Shrub or a small tree, with spreading branches, 3 to 4 m in height rarely up to 12 m. Leaves 8 to 12 cm long, oval or ovate, acute, dark green and glabrous above, glaucous or whitish beneath, usually only pubescent on the veins, involucre white or pinkish, 8 to 10.2 cm wide, bracts 4, obovate, emarginate. Fruit 1.3 cm long, scarlet, in dense clusters but individually distinct.

Part used : Bark.

Macroscopical : Usually in long quilled pieces up to 5 cm in thickness, which may be covered with the greyish-red outer bark; brittle, short fracture shows mottled red and white colour. Odour slight; taste bitter and a little aromatic, almost acrid when fresh. The drug in powder has reddish-grey colour.

Microscopical : 5 or 6 layers of cork cells with thickened walls, poorly developed phelloderm, cortical parenchyma consisting of roundish cells; phloem containing irregularly distributed groups of pitted, sclerosed cells with narrow lumina; cluster crystals of calcium oxalate in the cortical and pericyclic regions; absence of starch; a small amount of tannin in the region of bark.

Distribution : United States.

History and authority : Proved and introduced by Bute and Walker; Allen: *Encyclop. Mat. Med*., Vol. X, 492; Hering: *Guiding Symptoms,* Vol. IV, 463.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cornus Florida in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain on part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CUBEBA OFFICINALIS
(Cubeb. of.)

Botanical name : *Piper cubeba* Linn. **Family**: Piperaceae

Common names : *Hindi*: Kabab chini; *English*: Cubeb pepper; *French*: Cubebe; *German*: Kubeben.

Description : A perennial climber. Stem smooth, flexuous, joined. Leaves entire, petiolate, oblong or ovate-oblong, acuminate, rounded or obliquely cordate at the base, coriaceous and very smooth. Flowers in spikes, dioecious. Fruit a globose drupe with stem-like portion attached to its base which represents the pericarp known as the caphore.

Part used : Dry unripe fruit.

Macroscopical : Blackish in colour with a greyish bloom, nearly globular in shape, sometimes depressed at base and about 4 mm in diameter. Pericarp reticulately wrinkled; at the apex it bears a tri-radiate stigma and at the base abnormally prolonged into a slender stalk about 4 mm in length, contains a single seed. Odour strong, spicy and characteristic; taste somewhat bitter, strong and spicy.

Microscopical : Single, rarely double rows of radically elongated, rectangular, sclernchymatous cells in the inner layer of pericarp; the brown cell of outer epidermis containing small prisms of calcium oxalate; the hypodermis consisting of small groups of rectangular stone cells separated by thin-walled parenchyma; the parenchyma of the mesocarp containing rounded starch-grains and prisms of calcium oxalate; the large oil cells from the mesocarp and also from the perisperm of the seed; the large, polygonal, thin-walled cells of the perisperm filled with polyhedral starch grains; the reddish-brown cells of the seed-coat crossed by the cells of the hyaline layer and the absence of beaker-cells.

Distribution : Native of Java, Sumatra and Borneo and cultivated in Sri Lanka and to a small extent in India.

History and authority : First proved and introduced by Broughton, *Lond*, *Med. Gaz.*, 1, 405; Cattell, *"Symptoms" from Md. Times.* 8, 239, 295, des Hop., 842, B. J. of Hom, 11; Allen: *Encyclop. Mat. Med*., Vol. III, 626; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 627; Hering: *Guiding Symptoms*, Vol. IV, 522.

Preparation : (a) Mother Tincture ϕ Drug strength 1/100

Cubeba Officinalis in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand with *Dispensing Alcohol*.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

CUPRUM ACETICUM
(Cup. acet.)

Chemical formula : $(CH_3COO)_2$ Cu. H_2O **Mol. wt.**: 199.65

Common names : *English*: Cupric acetate; *French*: Acetate de cuivre; *German*: Kupferacetat.

Description : Dark green to greenish-blue transparent crystals or crystalline powder, smooth to touch with an odour of acetic acid. Soluble in 15 parts of water. At 100° it loses water of crystallization and at 110°, vapours of acetic acid are given off. Contains not less than 99.5 percent of $(CH_3COO)_2Cu.H_2O$ calculated with reference to the substance dried over *silica gel* to constant weight.

Identification : Solution in *water* after neutralisation complies with identification test for *copper*, H.P.I., Vol. I, and for *acetate*, H.P.I., Vol. I

Reaction : pH of 5 percent *carbon dioxide-free water* lies in between 5.0 to 5.5.

Insoluble matter : Dissolve 25 g in 5 ml of *acetic acid* sufficient *water* to produce 500 ml, warming if necessary. Filter through a weighed sintered glass crucible of G4 porosity, wash with *water* and dry at 105°. The residue weighs not more than 1.25 mg.

Chloride : Dissolve 1 g in 50 ml of *water* and add 1 ml of *nitric acid* and 1 ml of *silver nitrate solution*. No opalescence is produced.

Sulphate : Dissolve 2 g in 50 ml of 1 N *hydrochloric acid* and apply the test for *sulphate*, H.P.I., Vol. I

Alkalies and other metals : Evaporate to dryness 120 ml of solution retained from the *Iron test*, ignite and weigh the residue; not more than 0.8 mg obtained.

Iron : Dilute the filtrate retained from the assay to 150 ml with *water*, to 30 ml (retain the remainder for alkali and other metals) add 3 ml of dilute *sulphuric acid* and apply the test or *iron*, H.P.I., Vol. I

Assay : Dissolve about 1 g accurately weighed in 100 ml of *water* in a 200 ml beaker and add 5 ml dilute *sulphuric acid*, 15 ml of 7 percent w/v *ammonium thiocyanate* solution and 15 ml of a 6 percent w/v *hydroxylammonium chloride* solution, mixing after each addition. Heat on water-bath for 45 minutes, cool to room temperature, set aside for 10 minutes and filter through a weighed sintered glass crucible of G4 porosity. Retain the filtrate for test for *iron*. Wash the precipitate separately with 50 ml of *water*. Dry to constant weight at 110° and weigh. Each gram of the precipitate is equivalent to 1.642 g of $(CH_3COOH)_2Cu.H_2O$.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. IV, 16; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 633.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cuprum Aceticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

(c) Mother Solution ϕ — Drug strength 1/100

Cuprum Aceticum	10 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 3x and 4x with Purified Water to be prepared fresh; 5x in *Dilute Alcohol* and 6x and higher *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

CUPRUM SULPHURICUM
(Cup. s.)

Chemical formula : $CuSO_4.5H_2O$ **Mol. Wt.**: 249.70

Common names : *English:* Copper sulphate, Blue Vitriol; *French:* Sulfate de cuivre, Vitriol bleu; *German:* Kupfersulfat.

Description : Blue triclinic prisms of blue crystalline powder, slightly efflorescent in air. Odourless or almost odourless. Soluble in 3 parts of *water*, 5 parts of *glycerol*, very slightly soluble in *alcoho*l. Contains not less than 98.5 percent and not more than the equivalent of 101 percent of $CuSO_4.5H_2O$ with reference to the substance dried to constant weight on *silica gel*.

Identification : (i) To 10 ml of 2 percent w/v solution in *water* add 1 ml of dilute *hydrochloric acid* and add *hydrogen sulphide* saturated solution; a brownish black precipitate is formed which is insoluble in *ammonium sulphide* solution.

(ii) To 10 ml of a 2 percent w/v solution in *water*, add dilute *ammonium hydroxide solution*, drop wise, a pale blue precipitate is formed which dissolves in excess of the reagent forming a deep blue solution.

(iii) To 5 ml of 2 percent w/v solution in *water*, add 2 ml *potassium iodide solution*, a brown precipitate is formed and a brown liquid is produced. Dilute to 50 ml with *water* and add *starch* mucilage; a deep violet colour is produced.

(iv) Gives reactions characteristic of *sulphates*, H.P.I., Vol. I

Reaction and clarity of solution : Dissolve 1.0 g in 20 ml of *water*, a clear blue solution is produced. The pH of the solution is not less than 3.8.

Arsenic : Not more than 8 parts per million, H.P.I., Vol. I

Iron : Boil 5.0 g with 25 ml of *water*, add 2 ml of *nitric acid*, cool, make alkaline to litmus paper with strong *ammonium hydroxide solution*, filter, wash the residue with a mixture of 1 volume of dilute *ammonium hydroxide solution* and 4 volumes of *water*; dissolve the residue in a mixture of 2 ml of *hydrochloric acid* and 10 ml of *water*, make alkaline to litmus paper with dilute *ammonium hydroxide solution*, wash the residue with *water*, dry and ignite to constant weight; the residue after ignition is not more than 0.14 percent.

Lead and zinc : Dissolve 1.0 g in 10 ml water, add 1 g *citric acid* and 10 ml dilute *ammonium hydroxide solution*, followed by *potassium cyanide solution*, drop wise until blue colour is discharged, add 0.05 ml *sulphide solution*; not more than a slight darkening is produced.

Assay : Dissolve about 1.0 g accurately weighed, in 50 ml of *water*, add 3.0 g *potassium iodide* and 5 ml *acetic acid* and titrate the liberated iodine with 0.1 N *sodium thiosulphate* using starch mucilage as indicator, until only a faint blue colour remains. Add 2 g of *potassium thiocyanate* and continue the titration until the blue colour disappears; each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.02497 g of $CuSO_4.5H_2O$.

History and authority : First proved and introduced by Hahnemann; Allen: *Encyclop. Mat. Med*., Vol. I, 434; Hering: *Guiding Symptoms*, Vol. V, 196.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cuprum Sulphuricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I. Vol. I 6x may be converted to liquid 8x, H.P.I. Vol. I, 9x and higher with *Dispensing Alcohol.*

DOLICHOS
(Dolich.)

Botanical name : *Mucuna prurita* Hook. **Family**: Leguminosae (Fabaceae)

Synonyms : *Mucuna pruriens* Baker, *Stizolobium pruriens* (L.) Medik., *Dolichos pruriens* L.

Common names : *Hindi*: Koncha, Kawanch; *English*: Cowhage; *French*: Pois velus; *German*: Juckbohme (HAB).

Description : An annual twining herb. Leaves alternate, 3-foliolate, petioles 6 to 11 cm long. Leaflets 7.5 to 12 cm long, ovate or rhomboid, membranous, glabrescent above, adpressedly silky, pubescent beneath, mucronate. Flowers in elongate 6 to 30 flowered racemes, 15 to 30 cm long, solitary or 2 to 3 together along slender silky rachis; calyx 1 cm long, 2-lipped with a few irritating bristies; corolla 2.5 to 4 cm long, purplish. Pod 5 to 7.5 by 1.2 cm, 5 to 6 seeded, turgid, falcately curved on both ends somewhat like the letter 'S' longitudinally ribbed, densely clothed with persistent irritant bristles which are at first pale afterwards steel-grey.

Part used : The hairs carefully scraped from the epidermis of pod.

Microscopical : Occurs as loose, yellowish-brown felted mass of hairs, intermixed with occasional black fragments of the pericarp. The hairs are 1 to 2.5 mm long. Hairs unicellular and sharply pointed, with moderately thick, lignified walls and numerous minute and often recurved, circular prominence. They are about 60 µ in diameter at the base, above which they are slightly constricted and then widen to about 100 µ at the middle of the hair, finally tapering to an acute apex. They are stinging hairs and are not easily shaken off.

Distribution : Throughout the plains of India, Sri Lanka and Burma.

History and authority : First proved and introduced by Jacob Jeanes, *N. Am. J. of Hom*; Allen: *Encyclop. Mat. Med*., Vol. IV, 167; Hering: *Guiding Symptoms*, Vol. V, 143.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Dolichos 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

ERIODICTYON GLUTINOSUM

(Erio. g.)

Botanical name : *Eriodictyon glutinosum* Benth. **Family**: Hydrophyllaceae

Common name : *English*: Yerba santa.

Description : A low, shrubby evergreen plant, up to 1.5 m in height. Stem smooth, usually branched near the ground and covered with a peculiar glutinous resin which covers all the upper side of the plant. Leaves thick, leathery, smooth yellow in colour with a prominent midrib, alternate, with short petioles. Flowers bluish in terminal clusters of 6 to 10 in one-sided corolla funnel like, calyx sparsely hirsute.

Part used : Leaves.

Macroscopical : Occurs as fragments of leaves mixed with stem segments; when entire, leaves lanceolate from 5 to 15 cm in length and 1 to 3 cm in breadth, short petiolate coriaceous, brittle, with acute apex and tapering base, margin irregular, serrate or crenate-dentate, the upper surface yellowish to light brown or greenish-brown, coated with resin, the under surface light yellowish-brown to greenish-brown, conspicuously pinnate-reticulate; tomentose between the reticulations; odour aromatic; taste balsamic and bitter later becoming sweetish and slightly acrid.

Microscopical : Powder, greenish-yellow. Fragments of upper epidermis with large polygonal cells having straight vertical walls and linear striated cuticle; fragments of lower epidermis with small polygonal epidermal cells and stomata, numerous wavy, narrow, unicellular, non-glandular hairs or fragments there; glandular hairs each with a 1 to 3 celled-stalk and up to 8 or more celled resinous head, the latter up to 75 µ in diameter; fragments of palisade tissue containing regularly arranged rows of parenchyma cells, each containing a rosette aggregate crystal of calcium oxalate; numerous rosette aggregate crystals from 5 to 30 µ in diameter; fragments of spiral and simple pored tracheae associated with lignified fibres. The non-glandular trichomes when entire are up to 250 µ in length.

Distribution : California.

History and authority : Previously known as *Eriodyctyon Californica*, First proved and introduced by G. M. Pease; Allen: *Encyclop. Mat. Med*., Vol. IV, 218, X, 513; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 712.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Eriodictyon Glutinosum in *coarse powder* 100 g

Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

EUONYMUS ATROPURPUREA

(Euony. a.)

Botanical name : *Euonymus atropurpureus* Jacq. **Family**: Celastraceae

Common names : *English*: Bitter ash, Indian arrow wood.

Description : A shrub or small tree, up to 6 m in height. Leaves 3 to 12 cm long, elliptic, acuminate, obtusely serrate, pubescent beneath. Flowers purple, in slender peduncled many flowered cymes. Capsule deeply 3 to 4 lobed, scarlet.

Part used : Bark.

Macroscopical : Occurs in transversely curved pieces or in single quills of variable size and 1 to 4 mm thick. Outer surface greyish to greyish-brown, irregularly furrowed and ridged showing a soft, scaly cork and occasional transverse lenticels. Inner surface light yellowish-brown to pale yellow, longitudinally striate and porous. Fracture short exhibiting silky projecting elastic threads of a caoutchoue like substance. Odour characteristic; taste bitter and acrid.

Microscopical : Irregular cork zone showing lenticels and many layers of tangentially elongated cork cells whose walls may be either suberised or slightly lignified; cork cambium of meristematic cells; narrow cortex of tangentially elongated cortical parenchyma, some of the cells contain more or less spheroidal starch grains while others contain rosette aggregates of calcium oxalate; broad phloem. Some phloem and phloem rays contain starch grains while other possesses rosette aggregate of calcium oxalate. Secretory cells containing a reddish-orange to yellowish-orange cauotchoue-like substance which dissolves in *chloroform* and *carbon di-sulphide* are found scattered about amidst other cells of the phloem region.

Distribution : Europe.

History and authority : Introduced by Hale in 1867, *New Remed.,* 2nd ed., 340; Allen: *Encyclop. Mat. Med*., Vol. IV, 234; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 725.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Euonymus Atropurpurea in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	797 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

EUPHORBIUM
(Euphorb)

Botanical name : *Euphorbia resinifera* Berg. **Family**: Euphorbiaceae

Common names : *English*: Gum Euphorbium; *French*: Resine-d' Euphorbe; *German*: Euphorbiumharz.

Description : A fleshy, cactus-like shrub with quadrangular branches, less than 5 cm in thickness bearing along their angles scale-like leaves with prominent thorny stipules. Flowers small, hermaphrodite and borne on short peduncles in the leaf axils. Fruit tricoccoid loosely attached ripened carpels.

Part used : Dried resinous latex.

Macroscopical : Occurs as dull light brown or yellow tears or as oblong or rounded masses of irregular outline about the size of a pea or larger, frequently enclosing thorns, flowers or fruits, often forked or perforated by small apertures produced by the spines of the branches around which the latex had solidified, very brittle, internally dull yellow to yellowish-brown. Odourless but sternutatory; taste very acrid.

It is partially soluble in *alcohol*, *ether*, *petroleum ether* and *water* and is almost completely soluble in *glacial acetic acid*.

Identification : When a solution of Euphorbium carefully poured over 20 ml of *sulphuric acid* containing one drop of *nitric acid*, a blood red zone is developed at the junction of the two liquids.

Distribution : Morocco.

History and authority : First introduced and proved by Hahnemann in 1837; Allen: *Encyclop. Mat. Med*., Vol. IV, 246 and Vol. X, 521; Hering: *Guiding Symptoms*, Vol. V, 245.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Euphorbium in *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

FERRUM SULPHURICUM
(Fe. sulph.)

Chemical formula : $FeSO_4.7H_2O$ **Mol. wt.**: 278.00

Common names : *English*: Ferrous sulphate; *French*: Sulfate ferreux; *German*: Ferrosulfat.

Description : Green or bluish-green crystals or crystalline powder; odourless; soluble in *water*, insoluble in *alcohol*; efflorescent in dry air; on exposure to moist air, the crystals rapidly oxidise and becomes coated with brownish-yellow basic *ferric sulphate*. When *ferrous sulphate* has thus changed it must not be used. Contains not less than 97.0 percent and not more than the equivalent of 103 percent of $FeSO_4.7H_2O$.

Identification : Yields reactions characteristic of *ferrous salts*, H.P.I. Vol. I, and *sulphates*, H.P.I. Vol. I

Reaction : pH of a 5 percent solution in *carbondioxide-free water* is not less than 3.7.

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Copper : Dissolve 2 g in 50 ml of *water*, acidify with 1 ml of dilute *sulphuric acid*, saturate with *hydrogen sulphide solution*, no darkening or precipitate is produced.

Heavy metals : Dissolve 0.75 g in a mixture of dilute *sulphuric acid* and 40 ml of *water*. Add 50 mg of *hydroxylamine hydrochloride*, boil for 1 minute. Cool and add *water* to make 45 ml. To 15 ml of this solution add 4 ml of standard *lead solution* and dilute with *water* to 30 ml (A). Add to this solution and to the remaining 30 ml of *ferrous sulphate* solution (B) 10 ml of *hydrogen sulphide* solution. Solution B is not darker than solution A. The limit of heavy metals is 160 parts per million.

Alkaline salts and alkaline earths : Dissolve 1 g in 10 ml of *water*, oxidise by warming with a few drops of *nitric acid*, make alkaline with dilute *ammonium hydroxide* solution, filter, evaporate the filtrate and ignite. The residue is not more than 0.001 percent.

Oxysulphate : 1 g dissolve in 2 ml of *carbondioxide-free water* forms a clear solution which is not more than faintly turbid.

Ferric ion : Dissolve 0.1 g in 10 ml of freshly *carbon dioxide-free water*, add immediately 1 ml of dilute *hydrochloric acid* and 2 ml of *ammonium thiocyanate* solution. Any red colour produced is not deeper than that obtained, when 2 ml of *ammonium thiocyanate*

solution added to a mixture of 2.5 ml of *standard iron* solution, 7.5 ml of *water* and 1 ml of dilute *hydrochloric acid.*

Assay : About 1 g accurately weighed, dissolve in a mixture of 50 ml of *carbon dioxide-free water* and 20 ml of dilute *sulphuric acid,* add 2 ml of *orthophosphoric acid* and titrate with 0.1 N *potassium permanganate*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.02780 g of $FeSO_4.7H_2O$.

History and authority : First proved and introduced by Moore, O. A.; Allen: *Encyclop. Mat. Med*., Vol. IV, 330; Hering: *Guiding Symptoms*, Vol. V, 323.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Sulphuricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. IX

FUCUS VESICULOSUS

(Fucus. v.)

Botanical name : *Fucus vesiculosus* Linn. **Family**: Fucaceae

Common names : *English:* Bladder wrack; *French:* Fucus vesiculeux; *German:* Blasentang.

Description : Perennial frond or thallus is corse, light yellow or brownish-green in colour, erect and upto 1 m long. It attaches to rocks by branched, root-like, discoid woody extremities, developed from the base of the stalk. Frond, fan-shaped, narrow and strap-shaped at the base, the rest flat and leaf-like, wavy, many times divided, having a very broad compressed midrib running to the apex. Margin entire, olive-brown in colour.

Part used : Whole plant.

Macroscopical : Whole branching thallus about 1 m in length. Air vesicles usually in pairs, one on either side of the midrib and one at the form of the division are characteristic of this species. When quite dry it is hard, brittle, becomes softer and cartilaginous when moist. Some terminations are thickened due to presence of reproductive organs. Odour characteristics of seaweed; taste saline, mucilaginous and nauseatic.

Distribution : North America, Europe and North of the Meditarranean.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. IV, 369; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 792.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Fucus Vesiculosus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

GAMBOGIA
(Gambog.)

Botanical name : *Garcinia morella* Desr. **Family**: Guttiferae

Common names : *Hindi*: Tamel; *English*: Gamboge; *French*: Gutte; *German*: Gummigutt.

Description : A small tree, 9 to 15 m high. Leaves 10 to 15 cm long base, acute, veins indistinct, 4 to 8 mm apart; petiole about 8 mm, short, stout. Male flowers about 3, subsessile in the axils of fallen leaves or on peduncles 4 to 6 mm long. Sepals 2.5 mm orbicular, concave. Petals similar, but rather larger; stamens many in an obscurely 4-angled subglobose mass; the free portion of filament very short, anthers orbicular, flattened. Females flowers larger than the male, solitary, axillary, sessile or shortly pedicelled, staminodes about 12, bases connate or in a ring; ovary subglobose, stigma large, sessile 4-lobed, tubercled, lobes toothed. Fruit the size of a cherry, subglobose, slightly 4-lobed, 4-celled, 4-seeded. Seeds slightly compressed, dark brown, ovoid or reniform.

Part used : Gum resin.

Macroscopical : Occurs as yellowish emulsion in the cortex, pith, leaves, flowers and fruits of the tree not less than 10 years old. The best Gambogia is in cylindrical rolls from 2.5 to 7.5 cm in diameter, sometimes hollow in the centre. It is also found in lumps or flat cakes. The pieces are striated longitudinally and are externally of a dull orange colour with occasionally greenish stains, brittle with smooth, uniform conchoidal fracture. Powder bright yellow forms a yellowish emulsion with *water* and a clear deep orange solution in *ammonium hydroxide* solution and is partially soluble in *alcohol*. Odourless; taste acrid.

Microscopical : Numerous minute granules of resin scattered in ground mass of gum and are accompanied by occasional crystals of calcium oxalate and starch grains when thin splinters are mounted in oil.

Distribution : Assam, Bengal and Western Ghats from North Kanara southwards to Kerala.

History and authority : First proved and introduced by Nenning, Noack and Trinks, Handbuch, I, 801; Allen: *Encyclop. Mat. Med*., Vol. IV, 373; Hering: *Guiding Symptoms*, Vol. V, 354.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Gambogia in a *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

GENTIANA LUTEA
(Gent. lut.)

Botanical name : *Gentiana lutea* Linn. **Family**: Gentianaceae

Common names : *English*: Bitterwort; *French*: Gentiane Jaune, Grande gentiane; *German*: Gelber Enzain.

Description : An ornamental plant, up to 1 m in height. Leaves opposite, lower leaves petiolate, upper sessile, their bases embracing the stem, yellowish-green, oblong, pointed with five prominent veins on underside. Flowers large in racemes, heads or paniculate cymes; calyx tubular, 5 persistent; corolla tube nearly cylindrical lobes 4 or 5; stamens as many as corolla lobes, included. Ovary 1-celled; stigma 2-lobed; ovules several or many. Capsule sessile or stalked.

Part used : Rhizome and root.

Macroscopical : Sub-cylindrical pieces, entire or split longitudinally, form 15 to 20 cm or more in length and 2.5 cm in thickness. Outer surface of both rhizome and root is yellowish-brown to dark brown. Root longitudinally wrinkled. Rhizome bears numerous encircling leaf-scars as transverse annulations. When moist, tough and flexible but brittle when dry, breaks with short fracture; the smoothened, transverse surface reddish-yellow. A well marked, dark cambium ring separating a somewhat wide bark form large parenchymatous xylem which shows no distinctly radiate structure. Odour characteristic; taste first sweet but afterwards intensely bitter.

Microscopical : Powder: the abundant, somewhat thick-walled parenchyma containing small globules of oil and sometimes groups of minute needles of calcium oxalate, about 3 to 6 μ in length; small number of reticulate, annular and spiral vessels; groups of yellowish-brown cork cells; occasional small starch grains; the absence of stone-cells and fibres.

Distribution : Indigenous to Central Europe and Spain.

History and authority : Introduced in 1841 by Buchner; Allen: *Encyclop. Mat. Med*., Vol. IV, 407; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 816.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Gentiana Lutea in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

GINSENG
(Ginseng)

Botanical name : *Panax quinquefolium* Linn. **Family**: Araliaceae

Synonyms : *Ginseng quinquefolia* Linn, *Aralia quinquefolia* Dcne & Planch.

Common names : *English, French* and *German*: Ginseng.

Description : A perennial herb, with fleshy often forked roots, up to 30 cm in height. Stem bearing a single whorl of ternatelly compound leaves, leaflets 3 to 7 usually 5, stalked, the basal pair much smaller than the others, all ovate or obovate, dentate, acuminate; peduncle up to 50 cm bearing a 6 to 20 flowered umbel. Flowers greenish-white, all or mostly perfect. Styles usually 2. Berry bright red about 1 cm in diameter.

Part used : Root.

Macroscopical : Sub-cylindrical, somewhat spindle-shaped, fleshy and frequently two to several branched in lower portion, 2 cm in length and 2.5 cm in thickness, the upper portion with a crown showing one or more stem scars and annulations; lower portion annulated, irregularly longitudinally wrinkled and exhibiting rootlet scars; the external colour varying from yellowish-white (American & Chinese) to yellowish-brown (Korean); fracture short, internally pale yellow to yellowish-brown and exhibiting a broad soft whitish bark, a dark brown cambium line and a distinctly radiate wood; scattered through the bark and wood are numerous oil and resin canals. Odour slightly aromatic; taste sweetish, aromatic mucilaginous and slightly bitter.

Distribution : China, Japan, Korea, Easter North America in woodland.

History and authority : First proved and introduced by Jouve in 1836; Allen: *Encyclop. Mat. Med*., Vol. IV, 415.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ginseng in *fine powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

GRANATUM
(Granat.)

Botanical name : *Punica granatum* Linn. **Family**: Punicaceae

Common names : *Hindi*: Anar; *English*: Pomegranate; *French*: Grenadier; *German*: Grantbaum.

Description : A large dioecious shrub or a small tree, often armed. Leaves opposite, sub-opposite or clustered, 2.5 to 6.3 cm long, minutely pellucid-punctate, oblong or obovate, glabrous, entire, base narrowed into a very short petiole. Flowers 3.8 to 5 cm long and as much across, vivid red 2.5 to 1.3 cm tubular fleshy with 5 to 7 lobes; petals as many as calyx-lobes, 1.2 to 2.5 cm long, thin, wrinkled, bright red. Stamens numerous. Fruit 3.8 to 7.5 cm in diameter, globose, tipped with calyx-limb; the interior septate with membranous walls and containing numerous seeds.

Part used : Root bark.

Macroscopical : Occurs in channelled or curved pieces varying usually from 5 to 10 cm in length and 1 to 3 cm in width. Outer surface dull earthy in appearance and often exhibits conchoidal depressions where portions of the outer layer have exfoliated owing to the formation of cork; inner surface smooth and yellowish often with brown patches. Fracture short and granular and the smoothened transverse section nearly white with numerous, fine, tangential and radial lines. Taste slightly bitter and astringent.

Microscopical : Occasional patches of lignified cork cells, strongly thickened on the inner walls; the very numerous cluster-crystals of calcium oxalate, arranged singly in the parallel tangential rows of cells of the phloem parenchyma; the numerous, uniseriate, secondary phloem rays; the occasional, large, thick-walled laminated stone-cells occurring singly or in groups of 2 to 3; the small scattered starch grains, about 2 to 8 µ wide; the absence of fibres.

Distribution : Occurs wild in the Himalayas at altitude up to 1800 m, cultivated in many parts of India.

History and authority : Proved and introduced in 1839 by Muller, Hygea, X, 137; Allen: *Encyclop. Mat. Med*., Vol. IV, 469; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 832.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Granatum in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. IX

GRINDELIA ROBUSTA

(Grind. ro.)

Botanical name : *Grindelia camporum* Green. **Family**: Compositae (Asteraceae)

Synonym : *Grindelia robusta* Nutt.

Common names : *English:* Gum Plant, Wild Sunflower; *French:* Grindelia; *German:* Grindelienkraut.

Description : Perennial herb with stout, smooth, pale stem; leaves rigid, broadly cordate-oblong; achenes all or some of the outer 1-toothed or bordered at the summit.

Part used : Leaves and flowering tops.

Macroscopical : Stem: smooth, often 50 cm in length, up to 2 mm in diameter, yellow, sub-cylindrical. Leaves pale green, alternate, 3 to 6 cm long, oblong-spathulate with serrate margin and acute apex, rigid, brittle, sessile or amplexicaul and have a glabrous, minutely dotted surface. Capitula up to 2 cm in diameter, yellow, hard and resinous with four or five rows of lanceolate-acuminate, imbricate, recurved bracts, within which is single row of yellow, ligulate ray florets and a central group of tubular, disc florets; each of the ovaries or compressed fruits biauriculate at the summit and crowned by a pappus, consisting of one or two stiff, thick bristles. All parts are more less covered with resin, especially the capitula. Odour slight; taste balsamic.

Microscopical : Isobilateral structure of the leaves: the multicellular, sessile, broadly ovoid, glandular trichomes, 45 to 100 µ in diameter, occurring in depressions in the epidermis and containing minute calcium oxalate rosettes in the epithelial cells; the numerous lignified, bast fibres, small vessels and pollen grains.

Distribution : South Western United States.

History and authority : First proved and introduced by Bundy and Hale, *N. A. J. H.*, Vol. 25; Hering: *Guiding Symptoms*, Vol. V, 485; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 849.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Grindelia Robusta in *coarse powder*	100 g
Purified Water	150 ml
Strong Alcohol	877 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

HAEMATOXYLON CAMPECHIANUM

(Haemat. c.)

Botanical name : *Haematoxylon compechianum* Linn.

Family: Leguminosae (Fabaceae)

Common names : *English*: Logwood; *French*: Bois de Campeche; *German*: Campecheholz.

Description : A crookedly branched, small evergreen tree, with a deformed trunk; twigs smooth, beset with small white dots. Leaves alternate, abruptly pinnate bearing four pairs of small, smooth, cordate leaflets. Flowers small, slightly fragrant, longer than the leaves on long pedicels and in axillary racemes; pedicel filiform, spreading, 4 to 6 mm long, calyx 3 to 4 mm long; petals obtuse, 5, yellow; stamens as long as petals. Pod long, delicately veined, 2 to 5 cm long, 3 to 12 mm wide, very thin, pointed at both sides.

Part used : Heart wood.

Macroscopical : Hard, compact, heavy logs or billets, dull orange to purplish-red externally and reddish-brown internally; the smoothened transverse section shows narrow, closely-set medullary rays and narrow concentric dark brown zones alternating with paler ones. Odour of the chips or coarser particles slightly agreeable; taste sweet, astringent.

Distribution : Indigenous to Central America but naturalised in the West Indies.

History and authority : Introduced in 1839 by Jouve, *Bib*, Hom., De Ganev. 147; Allen: *Encyclop. Mat. Med.*, Vol. IV, 523; Clarke: A *Dictionary of Practical Mat. Med.*, Vol. I, 862.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Haematoxylon Campechianum in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

HELONIAS DIOICA
(Helon.)

Botanical name : *Chamaelerium luteum* (Linn.) A. Grey **Family**: Liliaceae

Common name : *English*: False unicorn.

Description : A perennial, dioecious herb, with a smooth stem, up to 1.2 m in height arising from a tuberous rhizome, which terminated by a spiked raceme of small white flowers. Leaves lanceolate, the lower ones spathulate. Fruit an ellipsoid, loculicidally 3-valved capsule up to 10 mm long and containing numerous linear-oblong seeds.

Part used : Rhizome and root.

Macroscopical : Rhizome: vertical or oblique, sub-cylindrical from 0.5 to 3 cm in length and about 1 cm in diameter; externally light brown to light yellowish-brown, annulate from scars of bud scales; upper portion with leaf bases enclosing a small bud each; oblique rhizome with a few stem scars up to 7 mm in diameter; lower portion with numerous light yellowish-orange to moderate yellow, slightly curved, wiry roots up to 8 cm in length; fracture hard and horny, internally light yellowish-brown to pale yellow, exhibiting a narrow cortex and a broad central cylinder with 3 to 4 irregular circles of small fibrovascular bundles. Odour slight; taste bitter and slightly astringent.

Microscopical : Rhizome: lignified cork zone, the cork cells with a brown amorphous contents; a broad cortex, through which extend outwardly, from the central cylinder, numerous lateral rootlets, emerging from the base of deep cylindrical pits which extend inwardly from the surface of the rhizome; stele of a matrix of parenchyma cells with many spheroidal or ellipsoidal starch grains from 2 to 15 μ in diameter, numerous raphides bundles of calcium oxalate up to 40 μ in length; the fibrovascular bundles laptocentric and arranged in 3 or 4 irregular circles, the tracheids showing either annular, porous or reticulate markings.

Root: an epidermis, a cortex of starch-parenchyma, an endodermis of radially elongated cells with lignified walls and central stele showing 5 to 7 vascular bundles each of xylem and phloem.

Distribution : United States and Canada.

History and authority : First introduced by C. V. Parr and proved by Tully, Jones, Branch and Clarke; Allen: *Encyclop Mat. Med.*, Vol. IV, 565; Hering: *Guiding Symptoms*, Vol. V, 544.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Helonias Dioica in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

HYDRANGEA ARBORESCENS
(Hydrang.)

Botanical name : *Hydrangea arborescens* Linn. **Family**: Saxifragaceac

Common name : *English*: Seven barks.

Description : An erect shrub, up to 3 m in height. Leaves long petioled, ovate, acute or acuminate, rounded or cordate at base, serrate, green and glabrous on both sides and somewhat pubescent or glaucous beneath, 7 to 15 cm long. Flowers in cymes up to 12 cm broad with none or few sterile flowers.

Part used : Rhizome.

Macroscopical : Cylindrical, usually cut in pieces from 3 to 10 cm in length and from 3 to 20 mm in diameter, externally light reddish-brown to yellowish-orange, longitudinally wrinkled, the upper portion marked by a few elliptical lenticels, occasional prominent buds and short branches or stem scars; from the lower surface arise a few coarse fibrous roots; fracture tough, splintery; internally pale yellowish-orange, bark thin, easily separable from the distinctly radiate wood which surrounds a prominent whitish pith. Roots attaining a length of 25 cm and a thickness 2 mm irregularly bent and branching, otherwise resembling the rhizome with the exception of the pith being absent. Odourless; taste sweetish, becoming slightly acrid.

Microscopical : Cork of a few rows of tabular cells containing orange to olive-brown amorphous contents; a cortex made chiefly of parenchyma containing starch, large cells containing raphides and small isolated groups of stone cells or sclerenchymatous fibres; a woody cylinder composed of slender wedges made up of prominent tracheae with reticulate thickenings and trachieds separated by medullary rays 1 to 3 cells wide, the cells of which are filled with small starch grains; pith of large polygonal cells with prominent simple pores.

Distribution : United States.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. I**,** 917.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Hydrangea Arborescens in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

ILLICIUM ANISATUM

(Illi. a.)

Botanical name : *Illicium verum* Hook. **Family**: Magnoliaceae

Common names : *English*: Sacred anise tree; *French*: Anise et ocle; *German*: Sterm Anis.

Description : A small tree. Leaves alternate, elliptic, short petioled, somewhat acuminate. Flowers mostly solitary, sessile or nearly so, yellowish, not fragrant with many very narrow petals and 20 to 30 stamens. Fruit consists of 6 to 11, usually 8, stellately arranged carpels attached to a stout, curved pedicle.

Part used : Seeds.

Macroscopical : Solitary seed in each carpel which is about 12 mm in length, boat-shaped and bluntly beaked at the apex, but flat at the base. Dark brown in colour and wrinkled; the ventral suture is often open, exposing the smooth, shining, hard, reddish brown seed, with brittle seed coat and large, soft, oily kernel. Odour aromatic; taste spicy.

Microscopical : Outer epidermis of the pericarp composed of brown, tabular cells with very thick outer walls and a strongly striated cuticle; the palisade stone cells with fairly large lamina, about 300 to 500 µ long; the palisade of the seed coat somewhat stellate, lignified idioblasts, about 220 µ by 145 µ, the inner epidermis of the seed coat with elongated cells, each containing several small calcium oxalate prisms; aleurone grains, 13 to 17 µ in diameter, seldom containing crystal inclusions.

Distribution : Indigenous to Southern and South-Western China and Japan.

History and authority : First proved and introduced by Franz in 1838, *Archiv.* XVII, 3; 175; Allen: Encyclop *Mat. Med.,* Vol. V**,** 91; Clarke: A *Dictionary of Practical Mat. Med.,* Vol. II**,** 16.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Illicium Anisatum in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

INULA
(Inula)

Botanical name : *Inula helenium* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: Elecampane; *French*: Racine dyuunec; *German*: Alant.

Description : A perennial herb, growing up to 2 m in height, with a thick solid, striated, hairy, branched stem bearing large, half clasping a alternate, cordate-oblong, unequally dentate-serrate leaves; lower radical leaves petioled and elliptic-oblong that are wooly beneath and large golden-yellow radiate heads of flowers. Each flower head is about 6 cm wide and consists of a naked receptacle bearing yellow, pistillate, ligulate flowers along the margin and a disc of yellow, perfect, tubular flowers in the centre, its exterior being covered by an imbricated involucre, the outer bracts of which are leaf like. Fruit 4 to 5 ribbed achene.

Part used : Rhizome and root.

Macroscopical : Rhizome fleshy and fusiform when entire, branching; usually cut into longitudinal or oblique or occasionally transverse pieces to which may be attached few root of variable length up to 4 cm in diameter; externally greyish-brown to dark brown, longitudinally wrinkled with occasional buds or stem scars; inner or cut surface somewhat concave, the edges incurved striate and more or less fibrous near the cambium zone; fracture short and horny; inner, surface light brown and showing circular or elliptical markings.

Root: cylindrical and tapering, frequently twisted, up to 15 cm in length and 1.6 cm in diameter. Odour characteristically aromatic; taste aromatic first then acrid and pungent.

Microscopical : Rhizome: cork of several rows of thin-walled, brownish, tabular cells. Cork cambium of meristematic cells. Cortex a zone of many layers of parenchyma cells containing inulin masses. Pericycle, of several layers of parenchyma cells. In old rhizomes this region contains many discontinuous groups of sclerenchyma fibres. Phloem, consists of radially arranged phloem patches, separated by broad phloem-rays, circular oleoresin reservoirs are arranged in nearly radial rows and form interrupted circles in this region and the cortex. Cambium, of meristematic cells. Xylem, in young rhizomes consisting of radiate wedges separated by broad xylem-rays which contain oleoresin reservoirs. Each xylem patch consists of matrix of inulin containing wood parenchyma, embedded in which are a number of pitted and reticulate tracheids associated occasionally with a few strongly lignified wood fibres. Xylem, in old rhizomes, shows narrow xylem-rays and thick-walled, lignified wood fibres replacing wood parenchyma. Pith, consisting of large-

celled parenchyma, containing inulin in smaller amounts than in the cortex. Intercellular air spaces in this zone are large.

Powder: light brown consisting chiefly of fragments of parenchyma containing inulin and small, irregular, separated masses of fragments of highly coloured oleoresin; occasional reddish-brown fragments of the walls of the oleoresin reservoirs; fragments of tracheids with reticulate thickening or elliptical pores associated occasionally with wood fibres.

Distribution : Europe and Asia.

History and authority : First proved and introduced by Fisherf; Allen: *Encyclop. Mat. Med.,* Vol. V**,** 112; Hering: *Guiding Symptoms*, Vol. VI, 196.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Inula Helenium in *coarse powder*	100 g
Purified Water	150 ml
Strong Alcohol	874 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

KALI CHLORICUM
(Kali. chl.)

Chemical formula : $KClO_3$ **Mol. wt.**: 122.56

Common names : *English*: Potassium Chlorate; *French*: Chlorate de potasse; *German*: Kalium-chlorate.

Description : Colourless transparent crystals having a cooling, saline taste. Soluble in 16.7 parts of *water* and insoluble in *absolute alcohol.* Contains not less than 99.5 percent of $KClO_3$ with reference to the substance dried at 105° to constant weight.

Insoluble matter : Dissolve 10.0 g in warm *water* to 100 ml. The solution is colourless. Filter through a weighed crucible. Wash with *water* and dry at 105°. The residue is not more than 0.015 percent.

Free alkali : Dissolve 5 g in 100 ml of *carbon dioxide-free water* and titrate with 0.02 N *hydrochloric acid* to pH 7. Not more than 0.25 ml of 0.02 N *hydrochloric acid* is required.

Bromate : Ignite 3 g and dissolve the residue in 10 ml of *water;* add 1 ml of dilute *sulphuric acid* and 0.1 g of a*mmonium persulphate*, allow to stand for 5 minutes; adding 2 ml of *chloroform* and shaking. No colour appears in the *chloroform* layer.

Chloride : Dissolve 2.0 g in 50 ml of *water* and add 1 ml of *silver nitrate* solution. No opalescence is produced.

Sulphate : Dissolve 2.0 g in 50 ml of 1 N *hydrochloric acid* and apply the *limit* test for *sulphates*, H.P.I., Vol. I

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Calcium group and magnesium : Dissolve 13.5 g in 150 ml of *water* and add 20 ml of *ammonia ammonium chloride* buffer solution, 25 ml of strong *ammonium hydroxide solution* and 5 drops of *sodium sulphide solution*. Titrate with 0.01 M EDTA using mordant black solution as indicator until blue colour is obtained. Not more than 1 ml of 0.01 M EDTA is required.

Heavy metal : Dissolve 5 g in 10 ml of hot *water* and 5 ml of dilute *ammonium hydroxide* solution and apply *limit* test for heavy metal, H.P.I., Vol. I,

Iron : Treat 5.0 g in 45 ml of *water* and 10 ml of *hydrochloric acid* and evaporate on a water-bath. Dissolve the residue by warming with mixture of 20 ml of *water* and 2 ml of dilute *hydrochloric acid* and apply *limit* test for *iron*, H.P.I., Vol. I

Assay : Dissolve about 0.3 g accurately weighed in 10 ml of *water* in a stopped flask, add 1 g of *sodium nitrate* dissolved in 10 ml of

water and then 20 ml of *nitric acid;* stopper the flask and allow to stand for 10 minutes add 100 ml of *water* and sufficient *potassium permanganate* solution to produce a permanent pink colour, decolorise by addition of a trace of *ferrous sulphate* and add 0.1 g of *urea*, add 30 ml of 0.1 N *silver nitrate*, filter, wash with *water* and titrate the filtrate and washings with 0.1 N *ammonium thiocynate*, using *ferric ammonium* solution as indicator. Each ml of 0.1 N s*ilver nitrate* is equivalent to 0.01226 g of $KClO_3$.

History and authority : First proved and introduced by E. Martin of Germany; Allen: *Encyclop. Mat. Med.*, Vol. V, 316; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 117.

Preparation : (a) Trituration 2x — Drug strength 1/100

Kali Chloricum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution ϕ — Drug strength 1/100

Kali Chloricum	10 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 3x and higher with *Dispensing Alcohol*.

Caution : Not to be dispensed below 4x.

KALI OXALICUM
(Kali ox.)

Chemical formula : $C_2O_4K_2.H_2O$ **Mol. wt.**: 184.24

Common names : *English*: Potassium oxalate; *French*: Oxalate de potasse.

Description : Transparent, odourless, colourless crystals, taste acidic saline. Soluble in 40 parts of water at ordinary temperature; insoluble in *alcohol.* Contains not less than 99.5 percent and not more than the equivalent of 100.5 percent of $C_2O_4K_2.H_2O$ with reference to substance dried at 105° to constant weight.

Identification : Yields reactions characteristic of *potassium salts,* H.P.I., Vol. I, and of oxalates, H.P.I., Vol. III,

Reaction : pH of a 5 percent solution in *carbon dioxide-free water* is between 7.2 and 8.2.

Chloride : Dissolve 20 g in 45 ml of warm water and add 5 ml of dilute *nitric acid* and 0.1 ml of *silver nitrate* solution. No opalescence is produced.

Sulphate : Dissolve 1 g in 50 ml of 1 N *hydrochloric acid* and apply the *limit* test for *sulphates,* H.P.I., Vol. I,

Iron : Dissolve 2.0 g in 30 ml of *water,* add 3 ml of dilute *sulphuric acid* and apply limit test for *iron* H.P.I., Vol. I.

Heavy metals : Mix 2 g with 2 ml of *water,* 2 ml *nitric acid* and 2 ml of *hydrogen peroxide* (100 volumes). Heat in a covered dish on water-bath until reaction ceases and then evaporates to dryness. Dissolve the residue in a mixture of 2 ml of *nitric acid* and 2 ml of *water* and again evaporate to dryness. Dissolve the residue by boiling with a mixture of 2 ml of dilute *hydrochloric acid* and 20 ml of *water.* Cool, dilute to 40 ml with water, add 10 ml of dilute *ammonium hydroxide* solution and apply limit test for heavy metals, H.P.I., Vol. I

Readily carbonisable substance : Heat 1 g with 10 ml of *sulphuric acid* until white fumes appears and allow to cool. Any colour produced is not deeper than that of a solution containing 0.1 ml of *cobaltous chloride* solution, 0.15 ml of *ferric chloride* solution, 0.15 ml of *cupric sulphate* solution, 0.25 ml of 1 N *hydrochloric acid* and 9.3 ml of *water*.

Assay : Dissolve about 0.3 g accurately weighed in 50 ml of *water,* add 5 ml of *sulphuric acid* and *titrate* at a temperature of 60° to 80° with 0.1 N *potassium permanganate.* Each ml of 0.1 N *Potassium permanganate* is equivalent to 0.009212 g of $C_2O_4K_2.H_2O$.

History and authority : First proved and introduced by John Jackson, Lond. Med. Gaz, 1840, 480; Allen: *Encyclop. Mat. Med.*, Vol. V, 384; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 148.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Oxalicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol*.

KALI PERMANGANICUM
(Kali. per.)

Chemical formula : $KMnO_4$ **Mol. wt.**: 185.00

Common names : *English*: Potassium permanganate; *French*: Permanganate de potasse; *German*: Vebermangan Saures Kali.

Description : Dark purple, slender, prismatic crystals having a metallic luster. Odourless; taste sweet and astringent. Soluble in 15 parts of *water* and in 3.5 parts of *boiling water.* It contains not less than 99.0 percent of $KMnO_4$ with reference to the substance dried at 105° to a constant weight.

Identification : (i) A solution in *water*, which is purple in colour when acidified with *sulphuric acid* and heated to 70°, is decolourised by a *hydrogen peroxide* solution.

(ii) Heated to redness, it decrepitates, evolves oxygen and leaves a black residue which with *water* forms *potassium hydroxide* solution*;* the resulting solution when neutralised with dilute *hydrochloric acid* gives the *reactions* characteristic of *potassium,* H.P.I., Vol. I

Chlorides sulphates : Dissolve 1 g in 50 ml of boiling *water*, heat on a water-bath and add gradually 4 ml or a sufficient quantity of *alcohol* (95 percent) until the meniscus is colourless; filter. 20 ml of filtrate complies with limit test for chlorides, H.P.I. Vol. I. 20 ml of filtrate complies with limit test for sulphate, H.P.I., Vol. I.

Assay : Dissolve about 0.8 g accurately weighed in *water* and dilute to 250 ml. Titrate this solution with 25 ml of 0.1 N *oxalic acid* mixed with 25 ml of *water* and 5 ml of *sulphuric acid*. Keep the temperature at about 70º throughout the titration. Each ml of 0.1 N *oxalic acid* is equivalent to 0.00316 g of $KMnO_4$.

History and authority : First proved by H. C. Allen, Am. Hom. Obs, 3, 345; Allen: *Encyclop. Mat. Med.,* Vol. V, 315; Hering: *Guiding Symptoms.* Vol. VI, 463.

Preparations : (a) Trituration 2x — Drug strength 1/100

Kali Permanganicum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I. 6x may be converted to liquid 8x, H.P.I., Vol. I. 9x and higher with *Dispensing Alcohol.*

(c) Mother Solution ϕ — Drug strength 1/100

Kali permanganicum	10 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x and higher up to 5x with Purified Water to be freshly prepared; 6x and higher with *Dispensing Alcohol*.

Storage : Preserve in a well-closed container.

KALI TARTARICUM

(Kali tar.)

Chemical forumla : $(K_2C_4H_4O_6)_2.H_2O$ **Mol. wt.**: 470.50

Common names : *English*: Potassium tartrate; *French*: Tartrate de potasse; *German*: Kaliumtartrat.

Description : Small, colourless, translucent, four or six sided prisms or white crystalline, slightly deliquescent powder; odourless; taste cooling and saline. Soluble in 0.5 part of *water;* almost insoluble in *alcohol.* When heated, it chars and gives off inflamable vapours having the odour of burnt sugar. At a higher temperature, the *carbon* is burnt off and a white fused mass of *potassium carbonate* remains. It is obtained by neutralising *potassium acid tartrate* with *potassium carbonate.* It contains not less than 99.0 percent of $K_4C_8H_8O_{12}.H_2O$ with reference to the substance dried at 105° to a constant weight.

Identification : It yields *reactions* characteristic of *potassium,* H.P.I., Vol. Iand of tartrates, H.P.I., Vol. I

Alkali and free acid : Dissolve 1 g in 10 ml of *wate*r; the solution not alkaline to *phenolphthalein* solution and requires not more than 0.1 ml of 0.1 N of *sodium hydroxide* solution to produce a pink colour.

Assay : Heat until carbonised about 2 g accurately weighed, cool and boil the residue with 50 ml of *water* and 50 ml of 0.5 N *sulphuric acid*; filter and wash with *water*; titrate the filtrate with 0.5 N *sodium hydroxide* solution using *methyl orange* solution as indicator. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.05881 g of $K_4C_8H_8O_{12}.H_2O$.

History and authority : First proved by Cattell, Br. J. of Hom., 11, 521; Allen: *Encyclop. Mat. Med.*, Vol. V, 387; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II**,** 161.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Tartaricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I 9x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

LAPPA MAJOR
(Lapp. maj.)

Botanical name : *Arctium majus* Bernh. **Family**: Compositae (Asteraceae)

Synonym : *Arctium lappa* Linn.

Common names : *English*: Bat weed; *French*: Bardane, Glouteron; *German*: Klette.

Description : A coarse, biennial weed. Stem up to 1 m in height, round, furrowed, succulant and pubescent, erect, branched and leafy. Leaves large, alternate, long-petioled, the upper ovate and lower cordate, dentate, green above and whitish, cottony beneath. Flowers purple in smooth heads; the imbricated scales of the involucres forming a hooked bur.

Part used : Root.

Microscopical : Simple, greenish-brown and usually occur in pieces from 5 to 20 cm long and from 0.5 to 2 cm thick, sometimes split longitudinally when the pieces assume a channelled form frequently showing internally a whitish, lacunous tissue. Externally longitudinally wrinkled and bear scars or small warty projections left by removal of the small secondary roots; near the crown and indistinct annulations is sometimes seen and at the top the felted-hairy remains of the leaf-bases may be present. Fracture short and horny. Transverse section shows, light-brown bark extending for about one quarter of the radius, then a dark cambium surrounding a compact and indistinctly radiate xylem, which passes towards the centre into a white parenchymatous pith. Odour slight; taste sweetish and mucilaginous.

Distribution : Europe and Northern Asia; naturalised in United States.

History and authority : Proved and introduced by Jeanes and S. A. Jones, M. R. 1893; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 155.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Lappa Major in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

LEPTANDRA
(Leptan.)

Botanical name : *Veronicastrum virginicum* (L.) Farwell.

Family: Scrophulariaceae

Synonyms : *Leptandra virginica* Nutt., *Leptandra verticillata* Hort, *Veronica virginica* Linn.

Common names : *English*: Culvers root; *French*: Racine de veronique; *German*: Leptandra wurzel.

Description : An erect somewhat pubescent perennial herb with quadrangular stem, attaining a height up to 2 m. Leaves in whorls of 4 to 7, lanceolate, upto 10 cm long, serrulate, smooth above and pubescent beneath; short petioled. Flowers in erect, long dense, terminal racemes, white or pale-blue, short pedicelled. Fruit, capsule oblong-ovate, longer than broad, pointed twice, exceeding the calyx, opening by four apical teeth.

Part used : Rhizome and root.

Macroscopical : Rhizome: horizontal in growth, nearly cylindrical, somewhat branched, the branches readily separable from the main rhizome, up to 10 cm in length and from 4 to 14 mm in diameter, externally light brown to moderate yellowish-brown, annulate from circular scar of bud scale; upper surface showing hollow stem bases, buds and circular stem scar; lower and lateral surface beset with wrinkled, fragile, rigid roots or remnants of roots; fracture of rhizome, very tough, woody and uneven; internally bark thin, brown and resinous, wood of nearly the same thickness as bark, yellowish-white to light brown and porous, pith large, brown and more or less hollow. Roots up to 10 cm in length and from 0.5 to 2 mm in diameter, of the same colour as rhizome, smooth or faintly longitudinally wrinkled; fracture short, internally showing a thick dark coloured cortex and a small light coloured central cylinder, Odour indistinct unless powdered, then characteristic; taste very bitter and acrid.

Microscopical : Rhizome: narrow layer of cork composed of thin-walled cells; parenchymatous cortex; pericycle containing a slightly interrupted ring of thick-walled pitted fibres and stone cells; absence of sclercnchymatous elements from the broad phloem; absence of true xylem rays from the cylindrical xylem; scattered vessels up to about 40 µ in diameter provided with oval bordered pits or horizontally elongated pits with less conspicuous borders and very oblique, simple perforations; spongy parenchymatous pith, abundant starch in the cortex and pith, the individual grains nearly

spherical or polygonal and generally less than 9 μ in diameter; occasional yellow or orange contents in some parenchymatous cells.

Distribution : Canada and United States.

History and authority : Introduced by Hale and proved by Burt; Allen: *Encyclop. Mat. Med*., Vol. V, 556; Hering: *Guiding Symptoms*, Vol. VII, 48.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Leptandra in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LUPULUS
(Lupul.)

Botanical name : *Humulus lupulus* Linn. **Family**: Cannabinaceae

Common names : *English*: Humulus; *French*: Houblon; *German*: Hopfen.

Description : A perennial plant giving out annular, rough, flexible stems by which it climbs to nearby objects by twining. Leaves opposite on long petioles, serrate, prickly, 3 to 5 lobed and deep green in colour. Flower axillary, dioecious, male and female flowers on separate plants. Male flowers in loose bunches or panicles, up to 8 cm long. Female flowers in leafy cone-like catkins which are about 3 cm long, oblong or ovoid consisting of number of overlapping bracts. Each bract enfolds at the base a small fruit achene.

Part used : Catkin.

Macroscopical : About 3 cm long, ovoid or flattened-ovoid. It consists of a hairy, zigzag axis, 12 to 16 mm long, carrying number of imbricated, pale yellowish-green, ovate, membranous bracts and stipules. In the axil of each bract is a small achenial fruit, over which its margin is folded; the stipules are flat and without fruits, the bracts and stipules are 15 to 30 mm long and 5 to 10 mm wide. Fruits and the bases of both the bracts and stipules are sprinkled with minute shining glands. Recently dried lupulus possesses a bitter, aromatic taste; odour strong aromatic which gradually becomes distinctly unpleasant.

Distribution : Europe and United States.

History and authority : Proved and introduced by Bethmann, A. H. Z., X, 72; Allen: *Encyclop. Mat. Med.*, Vol. V, 625; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 324.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Lupulus in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

MUREX PURPUREA

(Murex. p.)

Zoological name : *Murex brandaris* **Family**: Muricidae

Common names : *English*: Sea snail; *French*: Coquille a pourpre; *German*: Verschiedene Murex-Artex Daxtropoda.

Description : A symmetrical mollusk, having shell with long spout-like spines. The body is divisible into three regions, viz. anterior head, ventral region or foot and dorsal region or mantle covered by protective shells. Head distinct bearing eyes and tentacles. The mantle cavity opens interiorly, ctenidia present, there is highly developed proboscis; pallial siphon present. Foot provided with special glandular structures. On spreading apart the longitudinal glandular cleft of each side near the bottom an opaque white longitudinal strip caused by crowded pyriform sub-epidermal gland cells can be seen. In anterior part of these strips the gland cells are so numerous and crowded as to appear in sections as a deeply staining mass in which individual cells are not distinguishable. The glands are said to lubricate the *foot halves* during locomotion. There is peculiar adrectal gland situated at the side of rectum which secrets a fluid that is colourless and turns purple on exposure to air.

Part used : The desiccated juice.

Macrcscopical : Drug consists of the juice which is found in membranous sac situated between the heart and liver. The fresh juice appears as a viscid, colourless or greenish liquid which assumes red colour on exposure to air.

Distribution : Found abundantly on the shores of Mediterranean and Adriatic seas.

History and authority : First proved and introduced by Petroz; Allen: *Encyclop. Mat. Med.,* Vol. VI, 412; Hering: *Guiding Symptoms,* Vol. VII, 500.

Preparation : (a) Trituration 1x Drug strength1/10

Murex Purpurea desiccated juice	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the Trituration.

(b) Potencies: 2x and higher to be triturated in accordance with method, H.P.I., Vol. I; 6x may be converted to liquid 8x, H.P.I., Vol. I; 9x may higher with *Dispensing Alcohol*.

MYGALE
(Mygal.)

Zoological Name : *Mygale lasidora* **Family**: Antrodiaetidae

Synonym : *Antrodiaetus lasidora.*

Common name : *English*: Bird spider.

Description : A large spider covered with reddish-brown hairs with only four spinnerets, the anterior laterals absent. The male has 3 distinct tergites on the abdomen, the female shows only one. It generally feeds on ants, but often climbs trees by night to catch small birds. Spins no web but makes its home in clefts of hollow ravines.

Part used : Whole spider.

Distribution : Cuba.

History and authority : First proved and introduced by Houard; Hering: *Guiding Symptoms,* Vol. VII., 519; Allen: *Encyclop. Mat. Med.,* Vol. VI, 431.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Mygale	100 g
Purified Water	525 ml
Strong Alcohol	525 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII & X

NYCTANTHES ARBORTRISTIS
(Nyct. arb.)

Botanical name : *Nyctanthes arbor-tristis* Linn. **Family**: Oleaceae

Common names : *Hindi:* Harsinghar; *English:* Night Jasmine.

Description : A small tree, with grey or greenish rough bark. Branchlets quadrangular. Leaf opposite, ovate, 10.5 by 6.2 cm, small sessile. Bracteate heads disposed in terminal trichotomous cymes, 3 to 7 flowers in each head, sweet-scented, bracts elliptic up to 1.2 cm; calyx ovoid, cylindric, subtruncate; corolla salver-shaped, white. Stamen 2, inserted on the top of the corolla tube; filaments short, anthers almost subsessile; style cylindric, shortly bifid; ovary 2-celled, 1-ovule in each chamber. Capsule orbicular, compressed parallel to partition. Seed erect, orbicular, flattened.

Part used : Leaves.

Macroscopical : Short petioled, cordate or oblong, pointed, entire or coarsely serrate, scabrous. Taste bitter, astringent and stains the saliva when chewed.

Microscopical : A layer of epidermis with thick cuticle. Hairs abundant, unicellular, short or long with pointed end. Cystoliths of calcium carbonate at the base of hairs. Upper epidermis devoid of stomata while many are present on the lower epidermis. The lower epidermis also shows many glands with 4-celled heads. Palisade cells of two layers and 10 layers of spongy parenchyma. The spongy parenchyma cells are filled with oil and other cell contents. The midrib shows a small ridge of collenchymatous cells. Vascular tissue is arranged in the form of U-shaped arc at centre showing xylem at the ventral side and phloem on the dorsal side.

Distribution : Native of India, occurring in the sub-Himalayan region from Chenab to Nepal upto 1500 m and Chotanagpur, Rajasthan, Madhya Pradesh and Southwards to Godavari.

History and authority : Introduced by S. C. Ghose, *Drugs of Hindoosthan*, Vol. Ed., 232; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 631.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Nyctanthes Arbortristis, moist magma containing solid 100 g, plant moisture 350 ml	450 g
Purified Water	50 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol.* 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

OLEANDER
(Oleand.)

Botanical name : *Nerium oleander* Linn. **Family**: Apocynaceae

Common names : *English*: Rose laurel; *French*: Laurier rose; *German*: Oleander.

Description : An evergreen shrub or a small tree, up to 6.0 m high. Leaves opposite in pairs or in whorls of 3, narrowly oblong-lanceolate, 6 to 20 cm in length and 1 to 3 cm in width, leathery, transversely feather veined. Flowers salver shaped, pink or white, scentless, in terminal cymes; calyx with many glands inside at the base; corolla tube cylindrical at the base; throat bell-shaped and containing 5 wide or narrow teeth; lobes twisted to the right; anthers 2-tailed at the base, appendages of the anthers scarcely protruding; style 1; ovaries 2, forming pods; follicles 8 to 15 cm long, straight appressed, longitudinally striate, yellowish-green to light brown. Seeds numerous with tuft or brown hairs.

Part used : Leaves.

Macroscopical : Leaves 6 to 20 cm in length and 1 to 3 cm in breadth, dark green, whorled in three, short petioled, oblong, lanceolate, ribbed beneath, coriaceous thick at midrib and several secondary veins running almost parallel to each other.

Microscopical : Multi-layered upper and lower epidermis of compactly arranged thick-walled cell covered with cuticle; stomata confined to lower epidermis, present in stomatal pits lined by unicellular hairs; mesophyll differentiated into palisade cells on both surfaces and loosely arranged spongy parenchyma cells both containing chloroplast; mid-rib possessing U-shaped vascular bundle, the protoxylem towards the upper side and phloem on both sides. Other important features are the long fibres, crystals of calcium oxalate and unbranched or branched laticifers in the mid-rib region.

Distribution : Mediterranean region, often grown in gardens of India.

History and authority : First proved and introduced by Hahnemann: *Mat. Med. Pura,* Vol. VII, 138.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Oleander, moist magma containing solids 100 g, plant moisture 300 ml	400 g
Purified Water	100 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

PAREIRA BRAVA
(Pareira)

Botanical name : *Chondodendron tomentosum* Ruiz et. Pavon.

Family: Menispermacae

Synonym : *Cocculus chondodendron* DC.

Common names : *English*: Velvet leaf; *French*: Butua; *German*: Grieswurzel.

Description : Perennial, dioecious climber with stem attaining a thickness of up to 10 cm and with rough bark covered with warty protubrances. Leaves long petioled, ovate, cordate, smooth on upper surface but tomentose with an ashy hue on the lower. Flowers dioecious in racemes which are longer than the leaves in female plant. Fruit purplish-black, one-seeded oval drupe, occurring in bunches of six.

Part used : Root.

Macroscopical : Cylindrical, varying in lengths from 1.2 cm to 13 cm in diameter and from 5 cm to 1 m long; segments are cylindrical, more or less tortuous, externally brownish-black or blackish-brown with transverse ridges or knot-like projections, occasionally fissured and furrowed or longitudinally wrinkled, hard and tough, having a waxy luster when recently cut; the transverse surface exhibiting several successive eccentric and distinctly radiate concentric zones of projecting fibro-vascular bundles, separated from each other by concentric zones of parenchyma and stone cells. Odour indistinct; taste bitter. An infusion of the drug turns bluish-black with *iodine solution.*

Microscopical : Cork consisting of several layers of suberized cells with brown contents; cork cambium of meristmatic cells; cortex of several layers of parenchyma cells containing simple or 2 to 4 compound starch grains; several conentric zones of open collateral fibrovascular bundles alternating with zones of parenchyma containing starch. Each fibrovascular bundle exhibits an outer semi-circular phloem composed of sieve tissue and phloem parenchyma, a somewhat collapsed cambium and a radially elongated xylem composed of wide tracheids surrounded by wood fibres. The fibrovascular bundles are separated from each other by broad xylem rays whose cells contain abundant starch. Each circular zone of parenchyma shows on its inner face a nearly closed ring of stone cells, the walls of which are thick and porous.

Distribution : Brazil, Peru, West Indies and Central America.

History and authority : First proved and introduced by Foss; Hering: *Guiding Symptoms*, Vol. VIII, 263; Clarke: A *Dictionary of Practical Mat. Med*., Vol. III, 721.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pareira Brava in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

PIPER METHYSTICUM
(Piper. m.)

Botanical name : *Piper methysticum* Forst. **Family**: Piperaceae

Common names : *English*: Kava Kava; *German*: Kawawurzel.

Description : A shrub with woody, fibrous, rugged, aromatic rhizome. Stem erect, wavy and knotty, about 0.8 m in height. Leaves alternate, petiolate, radiate-veined, roundish or cordate. Stipules free, caducous, linear-lanceolate. Flowers solitary, axillary, on short pedunculated spreading spikes. Male spikes single, 5 to 8 cm long, densely flowered; bracts peltate, imbricate at first. Stamens-2; anthers subglobose, shorter than filaments.

Part used : Rhizome.

Macroscopical : Irregularly cubical or wedge-shaped pieces from 1.5 to 5 cm in thickness pale greyish-white to greyish-brown in colour and of somewhat loose texture. Transversely cut surface whitish and showing a large shrunken pith surrounded by narrow radial strands of xylem separated by wide medullary rays which are pale and extend almost the surface. Fracture coarsely fibrous and starchy. Odour slight and agreeable; taste bitter at first but subsequently becomes numbing.

Distribution : Indigenous to Sandwich Islands.

History and authority : Proved and introduced by Griswold, Hiller and Wolff; Hughes: *Manual of Pharmacodynamics*, 931; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 829.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Piper Methysticum in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

PIPER NIGRUM
(Piper. n.)

Botanical name : *Piper nigrum* Linn. **Family**: Piperaceae

Common names : *Hindi*: Kali mirch; *English*: Black Pepper; *French*: Poivre Noir (Commum); *German*: Schwarzer Pfeffer.

Description : A strong somewhat woody glabrous climber. Stems terete, sparingly rooting much thickened at the nodes. Leaves coriaceous, 10 to 18 cm in length and 5 to 12.5 cm in breadth, broad-ovate or ovate-oblong to nearly orbicular, rounded or more or less cordate at base and oblique, 5 to 9 nerved; petioles 1.3 to 2.5 cm long. Flowers in slightly interrupted glabrous spikes of variable length from 5 to 15 cm dioecious or sometimes polygamous; bracts of female spikes more or less adnate to the rachis, forming a semilunar ridge above the ovary. Stamens-2. Stigmas 2 to 4. Fruit small, sessile, globose, 6 mm in diameter or less, at first yellow becoming red when ripe.

Part used : Dry unripe fruit.

Macroscopical : Spherical, dark brown, superior and about 3.5 to 6 mm in diameter; surface deeply and coarsely reticulately wrinkled; at the apex the remains of sessile stigma visible. Vertical section shows a thin, narrow, dark pericarp within which is the whitish kernel of the single seed to which the pericarp firmly adheres. Kernel consists almost entirely of perisperm, hollow at centre, surrounded at its apex scanty endosperm in which the minute embryo is embedded. Odour aromatic; taste pungent. Aqueous solution remains clear on addition of alcohol.

Microscopical : The tabular epidermal cells containing small rectangular crystals about 6 to 10 μ long; the hypodermis of thin-walled parenchyma intermixed with numerous groups of rectangular or polygonal stone-cells with rather large lumina; the inner epicarpic sclerenchyma consisting of a single layer brown lignified beaker cells; the reddish-brown seed coat usually with the hyaline layer attached; the abundant starch mostly in large polyhedral masses, individual grains being angular and up to 7 μ in diameter; the oil cells of the perisperm and pericarp.

Distribution : Indigenous and cultivated in South India.

History and authority : Proved by Houat, *Hahn. Month.* 11, 369, 1867 and Berridge, Month. Hom. Rev., 1870, 14, 108; Allen: *Encyclop. Mat. Med*., Vol. VII, 552; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 833.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Piper Nigrum in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

PISCIDIA
(Piscid.)

Botanical name : *Piscidia erythrina* Linn. **Family**: Leguminosae (Fabaceae)

Common names : *English*: Jamaica dogwood; *French* and *German*: Piscidia.

Description : An evergreen tree, up to 7 m in height, with spreading branches. Leaves pinnate, leaflets 3 to 4 pairs (7 to 11), opposite, oblong or elliptical, pointed or blunt, rounded at base, downy on both surfaces when young, smooth when old. Flower purplish-white, 1.3 cm across in axillary compound racemes on three cornered downy stalks. Pod 5 to 10 cm long, bear four projecting longitudinal wings. Seeds 6 to 8, black.

Part used : Root-bark.

Macroscopical : Quills or curved pieces, 5 to 15 cm or nearly 1 m in length, 2 to 8 cm broad and 4 to 6 mm thick. Outer surface orange-brown, when cork is present and dark greyish-brown where the cork is exfoliated; wrinkled with thin projecting edge of exfoliating scales on the outer cork and somewhat fissured. When surface is scraped the exposed phloem is greenish-black. Older pieces are dull reddish-brown, with reddish corky warts and transverse fissures at intervals. Inner surface brownish, smooth and finely chequered. Fracture short, even in the outer part, somewhat splintery internally. Odour characteristic; taste somewhat acrid.

Distribution : Tropical America and West Indies.

History and authority : Proved and introduced by William Hamilton. *Pharm. Journ*, 1845, 76; Allen: *Encyclop. Mat. Med*., Vol. VII, 522; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 836.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Piscidia in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

POPULUS CANDICANS
(Pop. can.)

Botanical name : *Populus candicans* Ait **Family**: Salicaceae

Common name : *English*: Balm of Gilead.

Description : A tall tree, growing up to the height of 27 m. Leaves alternate, deciduous, cordate, pubescent, serrulate, bright green on upper surface and whitish beneath. Leaf buds reddish-brown and covered with fragrant oleoresin. Scales of catkins long-ciliate. Stamens 12 to 30; stigmas 2, nearly sessile, broadly dilated. Capsules ovoid 2-valved, 5 to 8 mm long, crowded on short peduncles, forming a compact spike-like raceme.

Part used : Buds collected in winter.

Macroscopical : Conical or pyramidal, pointed up to 25 mm in length and 15 mm in thickness; externally light reddish-brown to moderate brown, glossy and glutinous when fresh, consisting of a few small leaves at the centre; base enclosed by 15 oblong, pointed, concave, closely imbricated scales, the surface of which are covered with a thin-layer of sticky oleoresin, containing microscopic crystals of salicin which display colours with polarised light. Odour fragrant, balsamic; taste aromatic and bitter.

Microscopical : Epidermal cells of bud scales polygonal in surface view with heavily cutinized outer walls; hairs non-glandular, unicellular, conical up to 450 µ in length and 15 µ in thickness, abundant along the margin. Mesophyll parenchyma cells with reddish-brown to yellowish-orange. Oleoresin contents and occasionally a rosette aggregate of calcium oxalate up to 20 µ in diameter; stone cells in mesophyll numerous, up to 25 µ in diameter, single or in groups of up to 20 cells in transverse section.

Distribution : Northern United States, Canada and Europe.

History and authority : Allen: *Encyclop. Mat. Med.*, Vol. VIII, 154; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 878.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Populus Candicans in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	735 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3X and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VII

PRUNUS VIRGINIANA

(Prun. v.)

Botanical name : *Prunus serotina* Ehrh. **Family**: Rosaceae

Synonym : *Prunus virginiana* Duroi.

Common names : *English*: Wild black cherry; *French*: Ecorce de cerisier de virginie; *German*: Wildkirschenrinde.

Description : Usually a shrub, sometimes a tree up to 10 m tall. Leaves-thin, oblong to obovate, 5 to 12 cm long, obtuse, acute or abruptly short acuminate, obtuse to rounded at base, sharply serrate with slender ascending teeth. Racemes terminating leafy twigs, 6 to 15 cm long; pedicels usually 5 to 8 mm long, conspicuously glandular-erose, deciduous soon after anthesis. Petals white, about 4 mm long with subrotund blade. Fruit dark red or crimson, 8 to 10 mm in diameter, astringent, scarcely edible.

Part used : Inner bark.

Macroscopical : Occurs in irregular fragments or in curved or channelled pieces, upto 12 cm in length and 5 cm in width and not more than 3 mm in thickness. The young bark is covered externally with a thin smooth, reddish-brown to brownish-black, papery cork, which is frequently exfoliated, disclosing the smooth greenish-brown cortex; both the cork and the underlying cortex show numerous transversely elongated lenticels. Older bark is darker and rougher. The inner surface is cinnamon-brown in colour and shows fine, wavy, longitudinal striations which anastomose to form projecting reticulations. The fracture is short and granular. The smoothened transversely-cut surface is reddish-grey in colour and usually shows numerous pale red medullary rays alternating with phloem strands, containing sclerenchymatous tissues which on inner margin projects beyond medullary rays. Odour slight; taste astringent and aromatic bitter similar to that of bitter almond.

Microscopical : Numerous sclerenchymatous cells, usually in groups and often branched; the absence of typical phloem fibres; the minute starch grains which are simple or 2 to 5 compound; the prisms and occasional cluster crystals of calcium oxalate are present near the sclerenchyma.

Distribution : United State and Canada.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 891.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Prunus Virginiana in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

RHAMNUS FRANGULA
(Rham. fr.)

Botanical name : *Rhamnus frangula* Linn. **Family**: Rhamnaceae

Synonym : Frangula alnus Mill.

Common names : *English*: Alder Buckthorn; *German*: Faulbhaum.

Description : An unarmed deciduous shrub or small tree commonly 4 to 5 m tall. Branches sub-opposite, ascending at an acute angle to the main stem, without marked distinction into long and short shoot. Young twigs green becoming grey-brown, appressed-puberulent; bark of old branches smooth, in very old trees blaze lemon-yellow; young wood dark brown. Buds without scales, densely covered with brownish hairs. Leaves 2 to 7 cm long, petioled, obovate bluntly apiculate, entire undulate with caducous brownish tomentum particularly beneath, shiny green but turning clear yellow and red in autumn; large lateral veins about 7 pairs. Flowers 3 mm in diameter, on rather stout pedicels in axillary fascicles on the young wood. Calyx greenish, lobes 5, ovate; petals 5, small. Fruit 6 to 10 mm in diameter changing from green to red and then violet-black on ripening, 2 to 3 seeded.

Part used : Bark of young branches gathered in spring and kept at least for one year.

Macroscopical : Single or double quills about 1 to 2 cm wide, texture papery with an outer surface of smooth, dark purplish cork bearing numerous transversely-elongated whitish lenticles; when gently scraped, the crimson colour of the inner layers becomes evident; the inner surface brown, finely striated longitudinally, fracture short in the cork and cortex and fibrous in the phloem. Odourless; taste sweetish or slightly bitter.

Microscopical : Cork cells containing purplish-red contents; cortex containing large cells filled with mucilage; phloem containing numerous phloem rays 1 to 3 cells wide and tangential groups of fibres with prismatic crystals of calcium oxalate in files of cells forming a crystal sheath around each group; rosette crystals of calcium oxalate throughout and a few very small starch grains; stone cells absent.

Distribution : Throughout Europe and United States.

History and authority : Introduced in 1815, *Allg. Zeit. f. Hom.* II, 139; Allen: *Encyclop. Mat. Med*., Vol. VIII, 302; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 972.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Rhamnus Frangula in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2X and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

RICINUS COMMUNIS
(Ric. com.)

Botanical name : *Ricinus communis* Linn. **Family**: Euphorbiaceae

Common names : *Hindi*: Arand, Erandi; *English*: Castor oil plant; *French*: Semene de ricin; *German*: Wunderbalm.

Description : A tall glabrous and glaucous annual, sometimes shrubby or tree like. Leaf alternate, broad, palmately lobed; lobes 7 or more, serrate. Flower unisexual, rather large, in terminal sub-paniculate racemes; perianth simple and without any disc, the male flowers crowded in the upper portion of the inflorescence, the female flowers below. Male flower: calyx membranous, splitting valvately into 3 to 5 segments; stamens many; filaments connate and repeatedly branched; anthers with distinct distant subglobose divergent cells; pistillode none. Female flower calyx spathaceous, caducous; ovary 3-celled; style entire, 2-fid or 2-partite; ovules solitary in each cell. Fruit a prickly capsule of 2-valved cocci. Seed oblong, testa crustaceous, albumen fleshy; cotyledons broad, flat.

Part used : Ripe seeds.

Macroscopical : Rounded, oblong and somewhat flattened, 8 to 12 mm or more in length, with an arched, dorsal surface and a nearly flat ventral surface; the width is about two-thirds of the length and the thickness about one-third. Seed coat thin, brittle, smooth, glossy, varying in colour, greyish-brown to grey, mottled with reddish-brown or black spots, stripes. At one extremity of the seed there is a prominent and usually pale coloured caruncle, from which the raphe runs along with ventral surface as a distinct line to the other extremity where it terminates in a raised chalaza. Caruncle can be removed easily, disclosing the hilum beneath as a dark spot. A delicate, silvery white membrane inside the seed coat surrounds a large, yellowish-white, oily endosperm, which encloses the embryo with two large, papery cotyledons. Almost odourless; taste oily, slightly acrid.

Microscopical : Polygonal, pitted epidermal cells, some with and other without contents; the palisade layer of the seed coat, consisting brown, pitted, sclerenchymatous cells; large aleurone grains of the endosperm; the abundant fixed oil. The aleurone grains are round or ovoid and are upto 20 μ in diameter.

Distribution : Cultivated throughout India.

History and authority : Proved and introduced by Langier, *Am. J. Med. Sc.* 1828, 207; Allen: *Encyclop. Mat. Med.*, Vol. VIII, 400; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1012.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ricinus Communis in *coarse powder* — 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

SALIX PURPUREA

(Salix. p.)

Botanical name : *Salix purpurea* Linn. **Family**: Salicaceae

Common names : *English*: Red Willow; *German*: Purplishe Weide.

Description : A shrub or a small tree, spreading at base with long flexible branches. Leaves lanceolate, serrulate, glabrous, 7 to 16 cm long, often appearing opposite. Female flowers sessile, slender, recurved, scales purple; stamen 1. Capsule small, ovate.

Part used : Bark.

Macroscopical : Occurs in thin, channelled pieces, about 1 to 2 cm wide and from about 1 to 2 mm thick. Outer surface glossy, smooth or slightly wrinkled longitudinally or dull and rugged in older barks, grey or greenish in colour. Inner surface striated, fibrous and yellow, pale red or brown in colour. Fracture short in the outer part and fibrous in the phloem. Transverse section exhibits numerous minute, tangentially arranged groups of bast fibres. Odour slight; taste astringent and slightly bitter.

Microscopical : Two or three rows of cork cells, having strongly thickened and suberised, but not lignified outer walls which bulge outwards; the absence of stone cells from the phloem and the presence of prismatic crystals of calcium oxalate.

Distribution : Indigenous to United Kingdom, Central and Southern Europe.

History and authority : First proved and introduced by Duncar, in *N. Y. State Trans.* 1870, 328; Allen: *Encyclop. Mat. Med.*, Vol. VIII, 475; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1068.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Salix Purpurea in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. X

SARSAPARILLA
(Sarsap.)

Botanical name : S*milax ornata* Hook. f. **Family**: Liliaceae

Common names : *English*: Wild Liquorice; *French:* Salseparielle; *German:* Sarsaparille.

Description : A large, perennial climber. Rhizome underground, large, short knotted with thickened nodes and roots spreading up to 2 to 2.5 m. Stem erect, semi-woody, with very sharp prickles of about 1.3 cm. Leaf large alternate, stalked, almost evergreen with prominent veins, seven nerved, mid-rib very strongly marked.

Part used : Rhizome and root.

Macroscopical : Longitudinally wrinkled roots, about 3 mm in thickness, dark reddish-brown in colour and bear tolerably numerous branching rootlets, which are tough, flexible, not breaking easily even when bent double. Odourless; taste slightly bitter.

Microscopical : Rhizome strongly lignified cells of hypodermis, the wall being uniformly thickened, dark reddish-brown parenchymatous cortex, parenchymatous cells are thin-walled and without any starch, some cells are with bundles of acicular crystals of calcium oxalate embedded in mucilage; central stele consisting of a ring of yellowish wood with large radially arranged vessels, up to 15 to 20 µ wide, pitted and reticulate vessels up to 110 µ wide; white starchy pith of round-rectangular parenchymatous cells with pitted walls.

Distribution : Costa Rica, Mexico, Ecuador, Honduras, Peru and Jamaica.

History and authority : First proved and introduced by Hahnemann: *Mat. Med. Pura*., Vol. II, 459 and *Chronic Disease,* Vol. II, 1393; Allen: *Encyclop. Mat. Med.,* Vol. VIII**,** 526.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sarsaparilla in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3X and higher with *Dispensing Alcohol.*

SCUTELLARIA

(Scutel.)

Botanical name : *Scutellaria lateriflora* Linn. **Family**: Labiatae (Lamiaceae)

Common names : *English*: Helmet flower; *French*: Scutellaire; *German*: Helmkrut.

Description : A perennial, smooth herb with erect, freely branched, stem attaining a length of 80 cm. Leaves opposite lanceo-ovate or ovate-oblong, prominently petiolate, the lamina with acute apex, rounded or sub-cordate base and coarsely serrate margin. Inflorescence axillary and terminal, one-sided raceme of blue or rarely white or pink, bi-labiate flowers. Fruit consists of 4 brown nutlets, enclosed by a persistent calyx having the shape of a Quaker's bonnet.

Part used : Whole plant excluding root.

Macroscopical : Occurs either in the whole, crushed, chopped or pressed condition. When entire stem quadrangular, 50 to 80 cm in length and 1 to 4 mm thick, varying in colour from base, upward from purplish-brown to brown to yellowish-green, longitudinally furrowed, with distinct nodes and nearly glabrous, except on inflorescence axis. Fracture short. Leaves opposite, from 2 to 7 cm in length, long petiolate, ovate-lanceolate or ovate-oblong; apex acute or acuminate; base, acute or obtuse; margin coarsely serrate, venation pinnate-reticulate, the veins of the first order anastomosing near the margin; upper surface dark green, nearly glabrous; lower surface pale green with few appressed non-glandular hairs and many glandular hairs. Flowers in axillary, terminal, 1-sided racemes; calyx light green, hairy, companulate-bilabiate and toothed; corolla blue, rarely pink or white, tubular bilabiate; stamens 4, hairy, the anthers of the 2 lower stamens 1-celled, those of the 2 upper ones 2-celled and cordate; ovary deeply 4-lobed; style 2-cleft. Fruit composed of 4 ellipsoidal tuberculate, brown nutlets about 1 mm in length, enclosed within a persistent helmet-shaped calyx. Subterranean portion consisting of a stoloniferous shoot giving rise to numerous fibrous and branched, slender roots. Odour slight but characteristic; taste slightly bitter and aromatic.

Microscopical : Powder: dusky greenish-yellow. Numerous 1 to 3 celled non-glandular hairs with walls having short centrifugal projections, the basal cell large and cylindrical the apical cell narrowly tapering and often recurved; the nearly spheroidal, smooth pollen grains from 15 to 25 µ in diameter; narrow scalariform, reticulate and spiral tracheids, the wavy walled epidermal cells and elliptical stomata, the latter about 20 µ in length.

Distribution : United States and Canada.

History and authority : First introduced by Hale and proved by Gorde; Allen: Encyclop. *Mat. Med*., Vol. VIII, 549; Clarke: A *Dictionary of Practical Mat. Med*., Vol. III, 1130.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Scutellaria in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, Five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

SENNA
(Senna)

Botanical name : *Senna angustifolia* Mill. **Family**: Leguminosae (Fabaceae)

Common names : *Hindi:* Sana; *English*: Senna leaf; *French:* Folioles de sene; *German:* Senne-solatter.

Description : A shrub or undershrub with pale sub-terete or obtusely angled erect or ascending branches. Leaves usually 5 to 8 jugate; leaflets oval-lanceolate, glabrous. Racemes axillary, erect, laxly many-flowered, usually considerably exceeding the subtending leaf. Bracts membranous, ovate or obovate, caducous. Sepals obtuse, membranous. Legume flat, 15 to 17 mm in breadth. Seeds obovate, cuneate, compressed; cotyledons plane.

Part used : Leaves.

Macroscopical : Generally yellowish-green, about 2.5 to 6 cm long and 7 to 8 mm wide, lanceolate. They are tide in compressed bales, are usually flat and show faint, oblique or transverse markings, where the midrib and margins of the other leaves have been impressed. Odour slight; taste mucilaginous, slightly bitter and characteristic.

Microscopical : Vein-islet number 20 to 23. The palisade ratio for upper surface 4.0 to 7.5 to 12.0 and for lower surface 2.5 to 5.1 to 10.5; stomatal index for both surfaces 17.1 to 18.7 to 20.0. Epidermal cells polygonal with nearly straight anticlinal walls, many of the cells containing mucilage. Trichomes conical, unicellular, thick-walled, warty, frequently adpressed. Stomata in both epidermis and of the rubiaceous type. Midrib with a hemi-cylindrical masks of sclerenchymatous fibres on the upper side and a gutter shaped group of similar fibres on the lower side, cells containing prismatic crystals of calcium oxalate abutting on the fibres. Mesophyll containing idoblasts with cluster crystals of calcium oxalate.

Distribution : Cultivated in India.

History and authority : Proved and introduced by Wigan, Lancet, 1846, 1, 28 and Bley and Dissel, *Pharma. Journ.*, 1850 (Pharm. Cent. Bl; 1849, No. 8); Allen: *Encyclop. Mat. Med.*, Vol. VIII, 599; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1157.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Senna in *coarse powder*	100 g
Purified Water	500 ml

Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

SINAPIS ALBA
(Sinap. al.)

Botanical name : *Brassica alba* Bois. **Family**: Cruciferae (Brassicaceae)

Synonym : *Sinapis alba* Linn.

Common names : *Hindi*: Safed sarson; *English*: white mustard seeds; *French*: Moutarde blanche; *German*: Weisser Senf.

Description : An annual herb, stem up to 90 cm in height, bright green, erect with few ascending branches nearly smooth or with bristling reflexed hairs. Leaves alternate, petiolate, pinnatifid, usually hispid, segments ovate, toothed or lobulate. Flowers pale yellow, 1.3 cm in diameter, in terminal corymbs, extending as the fruit forms in to an elongated raceme. Pods about 2.5 cm, stalked, spreading, cylindric, beak half as long, flattened, sometime 2-seeded, valves and bases of the beak white with hispid hairs.

Part used : Ripe seeds.

Macroscopical : Subspherical, yellow-buff coloured, about 2 to 3 mm in diameter; testa with faintly pitted surface, showing the hilum as minute dark point; contains a yellow and oily embryo, consisting of 2 obcordate cotyledons incumbent upon hypocotyle, radicle of about the same length as the cotyledons. Seeds either whole or as powder, free from pungent odour; taste pungent. Odour on moistening the seeds with cold water, slight and musty. Seeds become coated with mucilage when soaked in water.

Microscopical : Large polygonal epidermal cells, about 40 to 80 µ in diameter, filled with mucilage, which stains pink with ruthenium red solution; hypodermis of two layers of collenchymatous cells. Palisade layer of yellowish sclerenchymatous beaker cells of fairly uniform height, about 30 to 40 µ in height and 5 to 10 µ in diameter; small irregularly rounded or ovoid aleurone grains, 9 to 12 µ in diameter, abundant fixed oil; starch and pigment layer absent.

Distribution : Cultivated throughout India.

History and authority : Proved and introduced by Bojanus, *Viertl. Jahrschrift of Hom.*; Allen: Encyclop. *Mat. Med.*, Vol. IX, 40; Clarke: A *Dictionary of Practical Mat. Med.*, Vol. III, 1192.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sinapis Alba bruised	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

SINAPIS NIGRA

(Sinap. n.)

Botanical name : *Brassica nigra* (Linn.) Koch. **Family**: Cruciferae (Brassicaceae)

Common names : *Hindi*: Aslirai, Taramira; *English*: Black Mustard; *French*: Moutarde noire; *German*: Nachtschatten (HAB).

Description : Annual, 0.6 to 0.9 m high, rigid branched, more or less hispid. Leaves petiolate, lower lyrate, upper entire, 10 to 20 cm long. Racemes naked. Flower 0.8 to 1.3 cm in diameter, bright yellow. Pods slender appressed to the stem, 0.6 to 1.5 cm subulate, valves keeled, torulose, cells 3 to 5 seeded. Seeds oblong.

Part used : Ripe seeds.

Macroscopical : Brown to dark purplish-brown, nearly spherical, with a minutely reticulated surface, about 1 mm in diameter, hilum is a paler point, contains a yellowish oily embryo, consisting of two folded cotyledons embracing a small radicle. Odour feeble when dried but on triturating with cold water, pungent odour is developed; taste at first bitter but rapidly becoming pungent.

Microscopical : Large, thin-walled, epidermal cells containing mucilage; single layer of small, polygonal, beaker-shaped sclerenchymatous cells varying in height, as seen in sectional view, from 3 to 10 µ and bearing a polygonal network (meshes 60 to 100 µ across) as seen in surface view; dark brown pigment layer attached to the sclerenchymatous cells, polyhedral cells of cotyledons and hypocotyl-radicle with thin cellulose walls, filled with fixed oil and small, rounded aleurone grains containing globoids but devoid of crystalloids.

Distribution : Cultivated in India, Holland, England, Italy and Germany.

History and authority : First proved and introduced by Catell and Butler; Allen: *Encyclop. Mat. Med*., Vol. IX, 46; Hering: *Guiding Symptoms*, Vol. IX, 426.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Sinapis Nigra in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

SQUILLA
(Squil.)

Botanical name : *Urginea maritima* (Linn.) Baker **Family**: Liliaceae

Synonym : *Scilla maritima* Linn.

Common names : *English*: Squill; *French*: Scille; *German*: Meerzwiebel.

Description : A bulbous, perennial plant with broad lanceolate, spreading recurved, pointed, somewhat undulated, dark green leaves. Whitish-green nerved flowers, forming a long raceme and terminating of a scape of from 0.5 to 1.3 m in length. Bulbs fibrous, rooted, roundish, ovate, very large, half above ground, either pale-green of red, with fleshy scale attenuated on their edges, closely piled over each other, covered by thin, dry exterior scales appearing like a membrane.

Part used : Bulb.

Macroscopical : Curved or straight, angular pieces, tapering towards each end, about 0.5 to 5 cm long and 3 mm thick or in small transverse slices of a yellowish-white colour, horny in texture, somewhat translucent and breaking with an almost glassy fracture, when quite dry but readily absorbing moisture when exposed to the air, becoming tough and flexible. Almost odourless; taste mucilaginous, disagreeably bitter and acrid.

Microscopical : Epidermis of axially elongated quadrangular or polygonal tubular cells, about 30 µ wide, 35 µ deep and 80 to 180 µ long upper epidermis and 50 µ wide, 5 µ deep and 150 to 300 µ long in lower epidermis; stomata absent or very few on adaxial surface. Mesophyll of polyhedral parenchyma cells which are 100 to 150 µ in diameter, some cells contain raphides of calcium oxalate, about 30 to 90 µ long, embedded in mucilage; exceptionally large cells contain very large raphides in bundles, about 100 to 1000 µ long, individual needles being 5 to 8 µ wide, also embedded in mucilage; many cells containing needle shaped crystals; the mucilage is stained pith with alkaline corallin solution, but gives no purple colour with iodine water; the mesophyll traversed by vascular bundles having spiral and annular vessels and consisting of thin-walled parenchyma containing very occasional starch grains.

Distribution : Indigenous to Mediterranean region, shores of Atlantic and the coast of Asia and Africa.

History and authority : First proved and introduced by Hahnemann, *Mat. Med. Pura,* Vol. II, 466; Allen: *Encyclop. Mat. Med.,* Vol. IX, 118.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Squilla in *coarse powder*	100 g
Purified Water	450 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

STILLINGIA SYLVATICA
(Stil. syl.)

Botanical name : *Stillinga sylvatica* Linn. **Family**: Euphorbiaceae

Common names : *English*: Queen's delight; *French* and *German*: Stillingie.

Description : A shrub. Stems clustered, glabrous herbaceous, up to 1 m high with an umbel like top and perennial roots. Leaves lanceolate to oval or oblong, glandular, crenulate to obtusely serrate, acute or obtuse, spikes 5 to 8 cm long. Flower small, yellow, monoecious, apetalous.

Part used : Root.

Macroscopical : Mostly in pieces; when entire, terete, unequally tapering, rarely branched, sometimes attaining a length of 40 cm and from 0.5 to 3 cm in diameter, externally brown to light red upon abrasion of the cork, longitudinally wrinkled; fracture very fibrous; internally the bark is light yellowish-brown, thick, spongy, finely fibrous, with numerous resin cells and easily separable form the porous, radiate wood; odour distinct; taste bitter, acrid and pungent.

Microscopical : Cork of necrosed cells with thick-walls and brownish contents in the outer region and thin, lignified cells in the inner region. Secondary cortex of starch parenchyma scattered tannin and oleo-resin secreting cells, containing rosette aggregates of calcium oxalate and very narrow, branching laticiferous ducts. Phloem a relatively broad zone composed of many radiating phloem strands separated by phloem rays. Phloem strands show cells containing starch, tannin or resin, scattered single or grouped, thick-walled, non-lignified or very slightly lignified bast fibres and strands of more or less collapsed sieve tubes.

Distribution : Indigenous to United States.

History and authority : First proved and introduced by Hale, *New. Rem.,* 2nd ed. 1003; Allen: *Encyclop. Mat. Med.,* Vol. IX, 169; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1269.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Stillingia Sylvatica in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	637 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*, 3x and higher, with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

SYMPHYTUM OFFICINALE
(Symph. of.)

Botanical name : *Symphytum officinale* Linn. **Family**: Boraginaceae

Common names : *English:* Comfrey; *French:* Consoude; *German:* Beinwurz.

Description : A perennial herb, up to 1 m in height with tuberous, thick roots. Stem branched, white-pilose. Leaves slightly pilose, bassel and lower cauline, ovate-lanceolate, upper oblong-laceolate, all broadly decurrent at base. Flowers in terminal drooping cymes, white, yellowish, purple or rose coloured; sepals 5, petals 5, ovary 4-lobed, nutlets, obliquely ovoid, erect, rugose.

Part used : Root.

Macroscopical : Cylindrical pieces of about 10 to 40 mm in length and 5 to 10 mm in diameter, externally nearly black and exhibits glistening crystals on the surface, strongly wrinkled longitudinally. Fracture short; fractured surface grayish-white and horny. The smoothened transverse surface shows a narrow bark separated by a dark cambium line from the radiate wood possessing wide xylem rays. Odourless; taste mucilaginous.

Distribution : Cultivated in Grate Britain and United States..

History and authority : Introduced by Croserio; Anshutz: *New Old and Forgotten Remedies* 392; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1340.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Symphytum Officinale in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

TARAXACUM
(Tarax.)

Botanical name : *Taraxacum officinale* Weber **Family**: Compositae (Asteraceae)

Common names : *Hindi*: Kanphul; *English*: Dandelion; *French*: Dent de Lion; *German*: Lowenzahn.

Description : A perennial herb with milky juice. Leaves radical, sessile, usually glabrous, variable in shape generally oblong, 5 to 20 cm long, irregularly pinnatifid, lobes linear or triangular, acute, toothed pointing downwards or rarely oblanceolate and nearly entire. Heads ligulate, 0.8 to 5.0 cm in diameter, glabrous, solitary on a hollow leafless stalk 5 to 20 cm long. Inner involucral bracts linear, erect, nearly equal, margin often white, tips usually thickened or hooked; outer bracts short, ovate, erect or recurved; receptacle flat, naked. Flowers yellow; pappus, copious, white, soft; ligules long, spreading, 3 to 5 toothed, ribbed, narrowed to the base, minutely spiny on the upper half, abruptly contracted into a long, slender beak crowded by the pappus.

Part used : Whole plant.

Macroscopical : Fresh root, yellowish white, externally whitish and fleshy internally. Often 30 cm or more in length and 12 to 25 mm in diameter. A bitter, milky juice exudes from fresh cut-surface. A small yellow wood is found in the centre. Dried root, dark greyish-brown, much shrivelled and wrinkled longitudinally and nearly cylindrical in shape. The upper part passes into a short, vertical rhizome which frequently branches, the summit of each bearing the short remains of leaves, near the insertion of which brownish hairs may be seen. Fracture horny and non-fibrous. Odourless; taste bitter.

Microscopical : Leaf: single layered epidermis, of cutinised cells, lysogenous cavities in the midrib with 3 to 5 fibrovascular bundles. Scape a single layer of epidermal cells inside which a 3 layers of fairly compact collenchymas. Most of the remaining part is composed of parenchyma in which the vascular bundles occur. There is a single whorl of about 30 to regularly arranged vascular bundles in the scape. Longitudinal section of scape reveals the bundles to be made up of annular, spiral and scalariform elements. The vessels measures 1.5 µ in diameter. The grains are warty, spherical, 30 µ in diameter.

Stem: single layer of epidermis of regular cutinised cells, 2 to 4 rows of fairly compact collenchymas among which are found many

leaf-traces with their collateral type of vascular bundles. The traces are arranged cyclically in uneven rings.

Distribution : Throughout Europe and India in Himalaya.

History and authority : First proved and introduced by Hahanemann; Allen: *Encyclop. Mat. Med.*, Vol. IX, 509; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1369.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Taraxacum, moist magma containing solids 100 g, plant moisture 300 ml	400 g
Purified Water	200 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

TAXUS BACCATA
(Tax. Bac.)

Botanical name : *Taxus baccata* Linn. **Family**: Taxaceae

Common names : *Hindi*: Kash; *English*: Yew; *French*: Coniferes; *German*: Eibenbaum.

Description : A tall tree, 18 m in height with a usually short trunk, occasionally 2.4 m or even more in diameter. Bark reddish, flaky, deeply fissured in old trees. Branches spreading forming a broad, low head, branchlets somewhat pendulous. Leaves 2-ranked, linear and usually falcate, shortly acuminate with a prominent mid-rib, dark green above, pale beneath 1.9 to 3.2 cm long or shorter in some varieties. Female cone 0.8 to 1.3 cm across with almost globose disc, about a third longer than broadly ellipsoid. Seed brown, 0.60 cm long.

Part used : Twigs.

Macroscopical : Branchlets are longitudinally channelled with smooth deciduous bark. Leaves 2 cm long, alternate but apparently in two rows, thickly set, linear, flat, nearly sessile entire, slightly revolute, smooth, dark green and shining above but paler beneath with prominent midrib terminating in small blunt point; odour foetid.

Microscopical : Leaf: presence of thick cuticle on both upper and lower epidermis, sunken stomata over-arching subsidiary cells in the lower epidermis; single veined, mesophyll differentiated into palisade and spongy parenchyma; transfusion tissue present right and left of the vascular bundle; absence of resin ducts and a few cells contain on alkaloid and tannin.

Stem: presence of soft wood, straight grain, well marked annual ring, vessels absent, medullary rays occur as fine lines on one cell width, secondary wood elements show a spiral marking in addition to bordered pits in a single series.

Distribution : Temperate Himalayas and Khasia Hills between 2000 to 3500 m.

History and authority : First proved and introduced by Gastier, *Bid Hom. d. Gen.* IV, 193; Allen: *Encyclop. Mat. Med.*, Vol. IX, 549; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1382.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Taxus Baccata, moist magma containing solids 100 g, plant moisture 150 ml	250 g
Strong Alcohol	874 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

THERIDION
(Therid.)

Zoological name : *Theridion curassavicum* Walk. **Family**: Agelenidae

Common names : *English*: Black spider of Curacoa; *French*: Arignee noir du curacoa; *German*: Feuerspinnchen.

Description : A spider about the size of cherrystone and found on orange trees. When young, it is velvety-black in appearance, marked with antero-posterior lines composed of white dots; the females are marked with similar strips, only larger, yellow above the anus; both sexes have square, yellow spot, notched on the edges, covering nearly whole belly. At the posterior part of the body there are three orangish-red spots, the largest of them placed just below the anus, while upon belly there is a large square, yellow spot. The thorax is black and the feet also, the latter being covered, with short, stiff hairs.

Part used : Entire spider.

Distribution : West Indies.

History and authority : First proved and introduced by Hering in 1832; Hering: *Guiding Symptoms,* Vol. X, 296; Allen: *Encyclop. Mat. Med.,* Vol. IX, 592.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Theridion	100 g
Purified Water	300 ml
Glycerin	200 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Caution : Not to be dispensed below 3x.

THYROIDINUM
(Thyroid)

Common name : *English*: Thyroid dessicated.

Description : The thyroid gland of domestic sheep (Ovis aries) removed from the recently killed sheep, dried at a temperature not exceeding 60º, powdered and defatted by extraction with light petroleum (40° to 60°) and dried. The proportion of iodine is determined in a small part of thyroid and the remaining part is mixed with sufficient saccharum lactis to produce a powder of required strength. Cream coloured amorphous powder; odour and taste faint and meat-like, contains 0.25 percent of iodine in thyroid combination (limits 0.23 to 0.27).

Identification : When suitably mounted and examined under a microscope, thyroid shows diagnostic structures; numerous characteristic fragments of the colloid contents of the vesicles of the gland in the form of smooth hyaline, angular or conchoidal particles with a few striations and varying greatly in size, often between 10 × 15 µ and 95 × 140 µ; pieces of connective tissues appearing as small irregularly cylindrical fragments with slightly undulated surface and frayed fibrous ends; occasional particles formed of small glandular vesicles still attached to each other and containing their hyaline colloid contents; a few isolated cells of epithelium, often exhibiting a large nucleus; a few small sparsely scattered fragments of striated muscle fibres; the colloid particles easily stain red with eosin solution and yellow with iodine solution.

Inorganic iodide : To 1.0 g, add 10 ml of a *zinc sulphate saturated solution*, shake for 5 minutes and filter. To 5 ml of the filtrate, add 0.5 ml of *starch mucilage* and 0.2 ml of a 10 percent w/v *sodium nitrate solution*, shake, add 0.2 ml of dilute *sulphuric acid* and shake again; no blue colour is produced.

Fat : To 1.0 g, add 20 ml of *light petroleum* (40 to 60) shake frequently during 2 hours, filter and wash the residue with 2 quantities each of 10 ml of *light petroleum* (40 to 60). Evaporate the combined extract and washings and dry at 105º; the residue weighs not more than 30 mg.

Acid insoluble ash : Not more than 0.5 percent.

Loss on drying : When dried to constant weight at 105º, loses not more 7.5 percent of its weight.

Microbial contamination : 1 g is free from Escherichia coli, 10 g is free Salmonellae.

Assay : Weigh accurately about 10 g and place in a 500 ml flask, add 100 ml of a cold 0.5 percent w/v *sulphuric acid,* mix thoroughly and set aside for 10 minutes. Filter the supernatant liquid. Repeat the operation with three further quantities, each of 100 ml of the *sulphuric acid solution,* filtering the extract through the same filter paper. Transfer the filter paper to the flask containing bulk of the powder, add 100 ml of 1 N *sodium hydroxide* and boil gently under a reflux condenser for 4 hours. Filter the hot solution and wash the residue with hot *water*. Combine the filtrate and washings in a 500 ml volumetric flask, cool and add *water* to produce 500 ml. Pipette 50 ml and adjust the reaction of this solution to pH 3.5 by means of 1 N *sulphuric acid,* using a glass electrode. Set aside in a cool place for 18 hours and filter. Transfer the filter paper and the contents to a nickel crucible about 20 mm in diameter and sprinkle a little anhydrous *sodium carbonate* on the surface of the precipitate and dry at 105º. Fill the crucible completely with *anhydrous sodium carbonate* well pressed down; invert the crucible and contents into a nickel crucible about 25 mm in diameter, containing a layer of anhydrous *sodium carbonate* about 1 cm thick and seal the junction of the 2 crucibles by adding more anhydrous *sodium carbonate.* Heat for thirty minutes over a Bunsen flame in such a manner that the outer crucible is at a uniform dull red heat, allow to cool, place in a 250 ml beaker, add 100 ml of *water* and boil gently for 10 minutes. Filter through a small plug of cotton wool and wash the residue with a little *water,* boil the crucible and residue a second time with 100 ml of *water* for 20 minutes, again filter and wash the residue with a little *water* until free from alkali. Transfer the mixed filtrates and washings to a 1000 ml flask, cool and add sufficient *water* to produce 500 ml. Neutralise the solution with 50 percent v/v *sulphuric acid,* using *methyl orange* solution as indicator. Add 1 ml of 50 percent v/v *sulphuric acid,* 0.2 ml or a slight excess of *bromine* and a small piece of marble and boil briskly until just colourless. Allow to cool and add 0.2 ml of 25 percent w/v solution of *phenol* in *glacial acetic acid* and allow to stand for at least 2 minutes. Add 5 ml of *potassium iodide solution* and titrate with 0.005 N *sodium thiosulphate* using *starch solution* as indicator. Each ml of 0.005 N *sodium thiosulphate* is equivalent to 0.0001058 g of *iodine* in combination with thyroxine.

History and authority : First introduced by Murray in 1892; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1437.

Preparation : (a) Trituration 1x — Drug strength 1/10

Thyroidinum powder	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20; 9x and higher with *Dispensing Alcohol*.

TONGO
(Tongo)

Botanical name : *Dipteryx odorata* Willd. **Family**: Leguminosae (Fabaceae)

Synonym : *Coumarouna odorata* (Willd.) Aubl.

Common names : *English*: Tongo bean; *French*: Semina Tonco, Feve Tonka; *German*: Tonko bohne.

Description : A large evergreen tree, up to 20 m in height. Leaves large, alternate, pinnate; leaflets 4, short petioled, oval, entire and apex pointed. Flowers in terminal cymes, purple with violet veins. Fruits indehiscent, ovate, containing a single brownish-violet exalbuminous seed.

Part used : Seed.

Macroscopical : Oblong or oblong-ovate, somewhat flattened, from 3 to 5 cm in length and from 10 to 15 mm in breadth, externally nearly black and usually covered with white a circular crystals of coumarin; the seed coat deeply wrinkled, internally yellowish-brown or dark yellow showing 2 large oily, plano-convex cotyledons enclosing a plumule and a short fleshy radicle. Odour fragrant; taste aromatic and pungent.

Microscopical : Palisade cells of the seed coat rectangular in cross section and polygonal in surface view with relatively thin-walled and broad lamina, the latter containing a black substance, the irregularly-shaped column cells, up to 25 µ in the height and 30 to 50 µ in diameter, the isodiametric parenchyma cells of cotyledons when the sections are cleared in *ether* and mounted in iodine solution show elongated aleurone grains and rounded simple starch grains, many of which are eroded and up to 9 µ in diameter.

Distribution : Guiana and South America.

History and authority : Proved and introduced by Nenning, *Annalin-d-Hom.* K1 IV, 125; Allen: *Encyclop. Mat. Med.,* Vol. X, 14; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1447.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Tongo in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2X and higher with *Dispensing Alcohol.*

TRITICUM REPENS
(Trit. rep.)

Botanical name : *Agropyrum repens* Beauv. **Family**: Graminae (Poaceae)

Common names : *English*: Couch; *French*: Chiendent; *German*: Queckenwurzel.

Description : A widely diffused grass, with a slender creeping rhizome, which extends for a considerable distance just beneath the ground, giving off lateral branches occasionally. Leaves flat with a long cleft sheath and are rough on the upper surface, having a row of hairs on veins. Flower in two-rowed spikes somewhat resembling those of eye or beardless wheat consisting of 8 or more oval spikelets on alternate sides of the spike each containing 4 to 8 florets.

Part used : Rhizome.

Macroscopical : Short, straight pieces hollow except at the nodes, about 3 to 20 mm long and 2 to 3 mm in diameter, straw-coloured, lustrous and strongly furrowed longitudinally. At the nodes are small, circular, root-scars and somewhat larger stem scars; very short pieces of stem or root are sometimes attached. Odourless; taste faint and sweetish.

Microscopical : Narrow hypodermal band of sclerenchyma; nearer the center, a wide band of sclerenchyma in which the principal vascular bundles are embedded; in surface view, the epidermis which consists of wavy-walled rectangular cells in parallel rows, in which long cells alternate with small twin cells. The twin cells are together about one-tenth the length of a long cell, the latter being about eleven times as long as it is broad.

Distribution : A native of Europe, naturalised throughout the Northern Hemisphere.

History and authority : Proved and introduced by Burnett; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1456; Blackwood, *Mat. Med., Therapeutics and Pharmacology*, 587.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Triticum Repens, moist magma containing solid 100 g, plant moisture 233 ml	333 g
Purified Water	167 ml
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

USTILAGO MAYDIS
(Ust. m.)

Botanical name : *Ustilago maydis* (DC) Cd. **Family**: Ustilaginaceae

Common names : *English*: *Maize* smut; *German*: Maisbrand.

Description : A fungus, growing on stems and tassel of corn in masses of varying sizes, smooth, spherical or lobed of a bluish tint becoming blackish, composed of innumerable minute globular spores covered with small processes.

Part used : Fungal galls.

Macroscopical : Fungus induced gall formation on the infected tissues. The galls may appear on stem, leaves, axillary bud on parts of male flower. They appear more commonly wherever ambryonic tissues are present. As galls enlarged they appear light coloured or almost white. With the darkening of inner tissue due to spore formation the white outer (epidermis) membrane ruputures exposing black spore mass.

Microscopical : The mycelium developed between the thin-walled cells of embryonic tissues induces hyperplasia, hypertrophy and excessive development of phloem elements in bundles. The mycelium is intercellular sending short absorbing branches into the cells. Each swelling is at first made up of masses of hyphae, the whole being covered with tightly appressed membrane, which has whitish appearance. The cells of hyphae lay down walls, which become rounded off as spores. They are also known as chlamydospores or brand spores. The spores are first dark olive green but on maturity dark brown. They are subspherical and show prominent but tiny spines.

Distribution : Common in Jammu, Kashmir, Punjab and Uttar Pradesh, Europe and United States.

History and authority : Proved and introduced by Burt; Allen: *Encyclop. Mat. Med.,* Vol. X, 49; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1487.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ustilago Maydis, moist magma containing solids 100 g, plant moisture 100 ml	200 g
Purified Water	300 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

(c) Trituration 1x	Drug strength 1/10
Ustilago Maydis in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with method, H.P.I., Vol. I, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20; 9x higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

UVA URSI
(Uvaur)

Botanical name : *Arctostaphylos uva-ursi* Spreng. **Family**: Ericaceae

Common names : *English:* Bearberry; *French:* Arbousier; *German:* Barentraube.

Description : A low, evergreen trailing shrub with thick creeping roots. Stem woody, rooting, young shoots only turning upwards, the pale-brown bark scaling of in patches. Leaves crowded, alternate, short petioled, obovate or spathulate, acute, entire, smooth. Flowers white on short reflexed peduncles in small terminal racemes. Fruit red berry like drupe, 5 to 10 seed like nutlets.

Part used : Leaves.

Macroscopical : Dark green or brownish-green in colour, obovate or spathulate, entire, very shortly petiolate and upto 3 cm in length, brittle, coriaceous and glabrous except near the base and on the petiole. Upper surface glabrous shining, tesellated by sunken veinlets. Odourless; taste astringent and somewhat bitter.

Microscopical : Epidermis of straight-walled, polygonal cells; stomata on the lower surface only, upto 50 µ long and surrounded by 4 to 7 cells; irregular prismatic crystals of calcium oxalate enclosed in the cortical collenchyma; palisade, 3 to 5 rows deep, small oil drops in most of the cells.

Distribution : Most part of Europe, United States, Mexico and Northern Asia.

History and authority : Proved by Noack and Trinks, Hahnemann, Heberden, Sauvauges, Mitchell, Essay, Bartram; Hering: *Guiding Symptom,* Vol. X, 375; Allen: *Encyclop. Mat. Med.,* Vol. X, 56.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Uva Ursi in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

XANTHOZYLUM FRAXINEUM
(Xanth. f.)

Botanical name : *Xanthoxylum fraxineum* Willd. **Family**: Rutaceae

Synonym : *Zanthoxylum americanum* Mill.

Common names : *English*: Prickly ash; *French*: Clevalier; *German*: Zahnewehholz.

Description : Tall shrub or rarely a small tree, up to 8 m tall with thorny stems and strongly aromatic foliage. Leaflets 5 to 11, opposite, almost sessile, ovate, entire or crenulate, dark green above, lighter and pubescent beneath, 3.8 to 5.1 cm long. Flowers small, greenish, in axillary sessile clusters, exstipulate; petals fringed at the tip. Ovaries 3 to 5; follicles stipitate, ellipsoid, about 5 mm long, surface pitted. Seeds black.

Part used : Bark.

Macroscopical : Curved or quilled, brownish-grey fragments, about 0.5 to 3 mm thick, 2 to 15 cm in length and up to 3.5 cm wide. Externally it is brown to brownish-black with greyish patches of lichens, bearing numerous black apothecia, present on the bark are numerous lenticels and occasional small emergences ending in spines. Fracture short. Inner surface yellowish-white exhibiting fines longitudinal striations and numerous glistening crystals. Odour slight; taste bitter, acrid and pungent.

Microscopical : Powder: numerous nearly spherical starch grains, 2 to 10 µ in diameter; the stone cells up to 150 µ in length, frequently containing reddish-brown contents; irregular fragments of nearly colourless, lignified cork cells; numerous glands containing droplets of secretion; crystals of calcium oxalate 10 to 250 µ in length.

Distribution : Grows in Northern, Middle and Western United States from Virginia to Texas.

History and authority : First proved and introduced by Cullis, Pub. *Mass. H. M. Soc.* II, 267; Allen: *Encyclop. Mat. Med.,* Vol. X**,** 169; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1572.

Preparations : (a) Mother tincture ϕ Drug strength 1/10

Xanthoyzlum Fraxineum in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	800 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two Parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

APPENDICES

APPENDIX—I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Acetic Acid : $C_2H_4O_2$

Contains 38 percent w/w of $C_2H_4O_2$.

Description: A clear, colourless liquid; odour, pungent; taste, sharply acidic.

Solubility : Miscible with water, with alcohol and with glycerin.

Weight per ml : At 25°, about 1.039, H.P.I., Vol. I. Arsenic: Not more than 1 part per million, H.P.I., Vol. I.

Heavy metals : Evaporate 5 ml to dryness in a porcelain dish on a water-bath, warm the residue with 2 ml of 0.1 N hydrochloric acid and add water to make 25 ml, the limit of heavy metals is 10 parts per million, H.P.I., Vol. I.

Chlorides : 5 ml complies with the limit test for chlorides, H.P.I., Vol. I.

Sulphate : 5 ml complies with the limit test for sulphates, H.P.I., Vol. I.

Certain aldehydic substances : Distil 50 ml and collect the first 5 ml of the distillate. Add 10 ml of mercuric chloride test solution and make alkaline with sodium hydroxide solution, allow to stand for 5 minutes and acidify with dilute sulphuric acid, the solution does not show more than a faint turbidity.

Formic acid and oxidisable impurities : Mix 5 ml with 2.0 ml of 0.1 N potassium dichromate and 6 ml of sulphuric acid and allow to stand for one minute. Add 25 ml of water, cool to 15°, add 1 ml of freshly prepared potassium iodide solution and titrate the liberated iodine solution with 0.1 N sodium thiosulphate, using starch solution as indicator. Not less than 1 ml of 0.1 N sodium thiosulphate is required.

Odourous impurities : Neutralise 5 ml with sodium hydroxide solution; the solution has no odour other than a faint acetous odour.

Readily oxidisable impurities : To 5 ml add 20 ml of water and 0.5 ml of 0.1 N potassium permanganate, the pink colour does not entirely disappear within half a minute.

Non-volatile matter : Leaves not more than 0.01 percent w/w of residue when evaporated to dryness and dried to constant weight at 105°.

Assay : Weigh accurately about 2.5 g into a stoppered flask containing 50 ml of water and titrate with 1 N sodium hydroxide using phenolphthalein solution as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.06005 g of $C_2H_4O_2$.

Acetone : C_3H_6O

Description : A clear, colourless, mobile and volatile, liquid; taste, pungent and sweetish; odour, characteristic, inflammable.

Solubility : Miscible with water, with alcohol, with solvent ether and with chloroform.

Boiling range : Not less than 95.0 percent. Distils between 55.5° and 57°, H.P.I., Vol. I.

Acidity : 10 ml diluted with 10 ml of freshly boiled and cooled water, does not require for neutralisation more than 0.2 ml of 0.1 N sodium hydroxide, using phenolphthalein solution as indicator.
Reaction : 10 ml diluted with 10 ml of freshly boiled and cooled water is not alkaline to litmus solution.
Methyl alcohol : Dilute 10 ml with water to 100 ml. To 1 ml of the solution add 1 ml of water and 2 ml of potassium permanganate solution in phosphoric acid. Allow to stand for ten minutes and add 2 ml of oxalic acid solution and sulphuric acid; to the colourless solution add 5 ml of decolourised magenta solution and set aside for thirty minutes between 15° and 30°; no colour is produced.
Substances reducing permanganate : To 20 ml add 0.1 ml of 0.1 N potassium permanganate and allow to stand for fifteen minutes; the solution is not completely decolourised.
Water : Shake 10 ml with 40 ml of Carbon disulphide; a coloured solution is produced.
Non-volatile matter : When evaporated on a water-bath and dried to constant weight at 105°, leaves not more than 0.01 percent w/v of residue.

Alcohol : (60 percent v/v) (Limits 59.0 to 61.0 v/v)
Dilute 632 ml of alcohol to 1000 ml of water.
Specific gravity : At 15.25°/15.25°, 0.8918 to 0.8871, H.P.I., Vol. I.
Refractive index : At 20°, 1.3617 to 1.3618, H.P.I., Vol. I.

Aluminium Wire : Al
Description : Bright, malleable, ductile metal with somewhat bluish tint.
Solubility : Soluble in dilute hydrochloric acid, sulphuric-acid, potassium hydroxide solution and in sodium hydroxide solution. Almost insoluble in nitric acid or in hot acetic acid.
Arsenic : Not more than 1 part per million, H.P.I., Vol. I.

Ammonia Solution Standard : Dilute 31.4 mg of *ammonium chloride* in water to make one litre (1 ml= 0.1mg NH_3)

Ammonia ammnium Chloride Buffer Solution : Dissolve 5.4 g of *ammonium chloride* in 70 ml of *dilute ammonia solution* and add sufficient water to produce 100 ml.

Ammonia ammnium Chloride Solution (Strong) : Dissolve 67.5 g of *ammonium chloride* in 650 ml of *strong ammonia solution* and add sufficient water to produce 1000 ml.

Ammonia Bromide: Of the H.P.I., Vol. III, under Ammonium Bromidum.

Ammonia Persulphate : $(NH_4)_2S_2O_3$
Contains not less than 98.0 percent of $(NH_4)_2S_2O_3$.
Description : Colourless crystals or white granules.
Solubility : Soluble in water.
Residue on ignition : Not more than 0.05 percent, H.P.I., Vol. I.
Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I.

Heavy metals : Not more than 30 parts per million, H.P.I., Vol. I.
Iron : Not more than 10 parts per million; 4 g complies with the limit test for iron, H.P.I., Vol. I.
Chloride : 10 g complies with the limit test for chlorides, H.P.I., Vol. I.
Assay : Dissolve 1.0 g of *ferrous sulphate* and 6 g of *potassium iodide* in a mixture of 50 ml of water and 50 ml of *dilute sulphuric acid*. Add 0.5 g of the finely powdered sample to half of this solution and allow to stand in a stoppered flask for thirty minutes. Titrate the liberated iodine with 0.1 N *sodium thiosulphate* using *starch mucilage* as indicator. Repeat the operation using the remaining portion of the solution and omitting the sample and substract the second burette reading from the first. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01141g of $(NH_4)_2S_2O_3$

Ammonium Sulphamate : $NH_2SO_3NH_4(H_6N_2O_3S)$
Contains not less than 99.5 percent and not more than 100.5 percent of $H_6N_2O_3S$ calculated with reference to the substance dried to constant weight at 105°.
Description : Colourless or white hygroscopic crystals.
Solubility : Readily soluble in *water*; sparingly soluble in *alcohol*.
Melting point : 130° to 133°.
Reaction : pH of a 5% solution is between 5 and 6.5.
Heavy metals : Not more than 5 parts per million, H.P.I., Vol. I.
Sulphated ash : Not more than 0.1 percent.
Loss on drying : Loses not more than 1 percent of its residue when dried to constant weight at 105°.
Residue on ignition : Not more than 0.02 percent, H.P.I., Vol. I.
Assay : Boil about 1.5 g accurately weighed, with a mixture of 10 ml of sulphuric acid and 50 ml of water for two hours under a reflux condenser. Transfer to an ammonia distillation apparatus, make alkaline with a 30 percent w/v solution of sodium hydroxide, solution and distil, collecting the distillate in 50 ml of 1 N sulphuric acid. Titrate the excess of acid with N sodium hydroxide, using methyl red solution as indicator. Each ml of 1 N sulphuric acid is equivalent to 0.05706 g of $H_6N_2O_3S$.

Antimony Solution, Standard : Dissolve 188 mg of antimony trichloride in a mixture of 20 volumes of hydrochloric acid and 80 volumes of water to make 1 liter. Dilute 1 ml of this solution with water to 50 ml (1 ml = 0.002 mg).

Antimony Trichloride : $SbCl_3$
Contains not less than 99.0 percent of $SbCl_3$.
Description : Colourless crystals or translucent crystalline masses, very deliquescent.
Solubility : Soluble in small quantity of water, decomposed by larger amounts to insoluble oxychloride. Soluble in hydrochloric acid, in alcohol and in chloroform.
Sulphate : 5 g complies with the limit test for sulphates, H.P.I., Vol. I.
Iron : 1 g complies with the limit test for iron, H.P.I., Vol. I.
Assay : Dissolve about 0.5 g accurately weighed, in a solution of 4 g potassium sodium tartrate in 30 ml of water, add 2 g sodium hydrogen

carbonate. Titrate immediately with 0.1 N iodine, using starch as indicator.
Each ml of 0.01 N iodine is equivalent to 0.001141 g of $SbCl_3$.

Ascorbic Acid : $C_6H_8O_6$
Contains not less than 99.0 percent of $C_6H_8O_6$.
Description : Colourless crystals or a white crystalline powder; odourless, taste acidic. Rapidly deteriorates in solution in presence of air.
Solubility : Soluble in 3 parts of water and in 30 parts of alcohol; practically insoluble in chloroform, in solvent ether and in benzene. Soluble in methyl alcohol.
Reaction : pH of a 2 percent w/v solution, 2.4 to 2.8.
Melting range : 190° to 192°, with decomposition, H.P.I., Vol. I.
Specific rotation : Determined in a 2.0 percent w/v solution in water at 20°, +22° to +23°, H.P.I., Vol. III.
Heavy metals : Dissolve 1 g in 20 ml of water, add 0.5 ml of 0.1 N hydrochloric acid and dilute to 25 ml with water; the limit of heavy metals in 20 parts per million, H.P.I., Vol. I.
Sulphated Ash : Not more than 0.1 percent, H.P.I., Vol. I.
Assay : Weigh accurately about 0.1 g and dissolve in a mixture of 100 ml of freshly boiled and cooled water and 25 ml of dilute sulphuric acid. Immediately titrate with 0.1 N iodine icing, starch solution as indicator as the end point is neared. Each ml of 0.1 N iodine is equivalent to 0.008806 g of $C_6H_8O_6$.

Benzene : C_6H_6
Description : A colourless, transparent liquid and inflammable.
Distillation range : Not less than 95 percent. Distils between 79.5° and 81°.
Weight per ml : At 20°, 0.876 to 0.881 g, H.P.I., Vol. I.
Sulphur compounds : Boil 10 ml with 1 ml of *absolute alcohol* and 3 ml of *potassium plumbite solution* for fifteen minutes. The aqueous layer remains colourless.
Thiophen : Shake 2 ml with 15 ml of *sulphuric acid* containing 3 mg of *isatin* in a stoppered tube for five minutes and allow to separate. No blue or green colour is produced.
Non-volatile matter : When evaporated on a water-bath and dried to constant weight at 105°, leaves not more than 0.01 percent w/v of residue.

Bismuth Oxide Nitrate : (Bismuth oxynitrate, Bismuth nitrate basic)
It is prepared by partial hydrolysis of Bismuth nitrate. Contains 70.0 to 74.0 percent of Bismuth.
Description : A white, slightly hygroscopic micro-crystalline powder; odourless; tasteless.
Solubility : Insoluble in water, in alcohol; readily soluble in *dilute hydrochloric acid* and in *dilute nitric acid*.
Assay : Dissolve about 1 g accurately weighed in a mixture of 20 ml of *glycerol* and 20 ml of *water*. Add 0.1 g of *sulphuric acid* and tritrate with 0.05 M *disodium nitrate*, *edetate*, using *catechol violet solution* as

indicator. Each ml of 0.05 M *disodium edetate* is equivalent to 0.01045g of Bismuth.
Storage : Keep in a well-closed container protected from light.

Boric acid : Of the H.P.I., Vol. III.

Butyric Acid : $C_4H_8O_2$
Of the H.P.I., Vol. III.

Calcium Acetate : $(CH_3COO)_2Ca$
Description : Very hygroscopic, rod-shaped crystals.
Solubility : Soluble in *water*; slightly soluble in *methanol*, practically insoluble in *ethanol*, in *acetone* and in *benzene*.

Chloral Hydrate : $CCl_3CH(OH)_2$
Contains not less than 90.0 percent of $C_2H_3O_2Cl_3$.
Description : Colourless transparent crystals; odour pungent but not acrid; taste, pungent and slightly bitter. Volatilises slowly on exposure to air.
Solubility : Soluble in 0.25 parts of *water*, in 1.3 parts of *alcohol*, in 2 parts of *chloroform* and in 1.5 parts of *solvent ether*.
Reaction : 2 ml of a 10 percent w/v solution gives a yellow or orange colour on addition of solution of *dimethyl yellow*.
Chloride : 3 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Chloral alcoholate : Warm 1 g with 6 ml of water and 0.5 ml of *sodium hydroxide solution*, filter and add sufficient 0.1 N *iodine* to impart a deep brown colour and set aside for one hour; no yellow crystalline precipitate is produced and no smell of iodoform is perceptible.
Assay : Weigh accurately about 4 g and dissolve in 10 ml of water and add 30 ml of 1N *sodium hydroxide*. Allow the mixture to stand for two minutes and then titrate with 1 N *sulphuric acid*, using *phenolphthalein solution* as an indicator. Titrate the neutralised liquid with 0.1 N silver nitrate using *potassium chromate solution* as an indicator. Add two-fifteenths of the amount of 0.1 N silver nitrate used to the amount of 1N sulphuric acid used in first titration and deduct the figure so obtained from the amount of 1N *sodium hydroxide* added. Each ml of 1N *sodium hydroxide* obtained as difference is equivalent to 0.1654 g of $C_2H_3O_2Cl_3$.

Cobaltous Chloride: $CoCl_2.6H_2O$
Syn. : Cobalt chloride.
Contains not less than 97.5 percent of $COCl_2.6H_2O$.
Description : Deep red crystals or crystalline powder.
Solubility : Freely soluble in *water*; soluble in *ether*, in *alcohol* and in *acetone*.
Clarity of solution : 5.0 g dissolved in 50 ml of water to yield a clear pink solution.
Iron : Dissolve 3.0 g in 30 ml of water, add 0.3 g of *zinc oxide* and boil for one minute. Filter with suction, wash the residue with water, dissolve in 4.5 ml of *dilute hydrochloric acid* and 30 ml of water, add 0.3 g of *zinc oxide* and again boil for one minute. Filter with suction, wash the residue with water, dissolve in 6 ml of *dilute hydrochloric*

acid and add sufficient water to produce 60 ml. 4 ml of this solution complies with the limit test for iron, 6 drops of *thioglycollic acid* being used.
Sulphate : 0.5 g complies with the limit test for sulphates.
Assay : Dissolve 1g in 300 ml of water, add 2 g of *hydroxylammonium chloride* and 25 ml of *strong ammonia solution* and heat to above 80°. Titrate the solution with 0.1 M *disodium edetate* using *methyl thymol blue* mixture as indicator, until the colour changes from blue to purple. Each ml of 0.1 N disodium edetate is equivalent to 0.02379 g of $COCl_2 6H_2O$.

Cobaltous Chloride Solution: Syn. : Cobalt Chloride solution.
Dissolve about 65 g of cobaltous chloride in a sufficient quantity of a mixture of 25 ml of *hydrochloric acid* and 975 ml of *water* to produce 1000 ml; determine the proportion of *cobalt chloride* ($COCl_2.6H_2O$) in the solution, by the Assay prescribed below and adjust the strength of the solution to 59.5 mg of $COCl_2.6H_2O$ per ml by the addition of a calculated quantity of a mixture of 25 ml *hydrochloric acid* and 975 ml of *water*.
Assay : Place 5 ml in a 250 ml glass-stoppered flask, 2.5 ml of *hydrogen peroxide solution* and 15 ml of *sodium hydroxide solution*, boil for ten minutes, cool, add 2 g of *potassium iodide* and 20 ml of a mixture of 1 volume of *sulphuric acid* and 3 volumes of *water*, allow the precipitate to dissolve and titrate the liberated iodine with 0.1 N *sodium thiosulphate*. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.0238 g of $CoCl_2.6H_2O$.

Copper Acetate : $(CH_3COO)_2Cu.H_2O$.
Syn. : Cupric acetate.
Contains not less than 98.0 percent of $C_4H_6CuO_4.H_2O$.
Description : Dark bluish-green crystals or a green powder having a faint odour of acetic acid, efflorescent in dry air.
Solubility : Soluble in water and in alcohol; slightly soluble in ether.
Iron : 2 g complies with the *limit test for iron,* H.P.I., Vol. I.
Chloride : 3 g complies with the *limit test for chlorides,* H.P.I., Vol. I.
Sulphate : 1.5 g dissolved in 5 ml of *dilute hydrochloric acid* complies with the *limit test for sulphates,* H.P.I., Vol. I.
Assay : Dissolve 0.8 g in 50 ml of *water*, add 2 ml of *acetic acid* and 3g of *potassium iodide* and titrate the liberated iodine with 0.1 N *sodium thiosulphate*, using starch mucilage as indicator, until only a faint blue colour remains; add 2 g of *potassium thiocyanate* and continue the titration until blue colour disappears. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01997 g of $C_4H_6CuO_4.H_2O$.

Copper Acetate, Dilute Solution of : A 0.05 percent w/v solution of *copper acetate* in water.

Copper, Solution Standard : Dissolve 393 mg of cupric sulphate $CuSO_4.5H_2O$ in water to make one litre. Dilute 1 ml of this solution with water to 10 ml. (1 ml = 0.01 mg of Cu).

Cuprous Chloride : CuCl

Contains not less than 98.0 percent of CuCl.
Description : White crystalline powder or cubic crystals. Stable to air and light if dry, but in presence of moisture, turns green on exposure to air and blue to brown on exposure to light.
Solubility : Sparingly soluble in water with partial decomposition, practically insoluble in alcohol, in acetone; soluble in *concentrated hydrochloric acid* and in *concentrated ammonium hydroxide*.
Sulphate : 3 g complies with the *limit test for sulphates*, H.P.I., Vol. I.
Iron : 2 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Arsenic : Not more than 1 part per million.
Assay : Dissolve about 0.5 g accurately weighed in 30 ml of a cold solution containing 10 g *ferric ammonium sulphate* in 100 ml of (1+1) *hydrochloride acid*. Add 5 ml of *phosphoric acid* and titrate with 0.1 N *potassium permanganate*. Repeat the procedure as described above, omitting the substance being tested. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.009903 g of CuCl.
Storage : Store in a tightly closed container protected from light.

Cuprous Chloride, Solution 15 percent : A 15 percent solution of *cuprous chloride* in *hydrochloric acid*.

Dimethyl Yellow : $C_{14}H_{15}N_3$
Syn. : 4 dimethylamino-azobenzene; Methyl yellow.
Description : Yellow crystalline powder or plates.
Solubility : Insoluble in *water*; soluble in *alcohol*, in *benzene*, in *chloroform* and in *ether*.
Sulphated ash : Ignite 0.5 g with 0.5 ml of *sulphuric acid* to constant weight. Not more than 1.0 mg of residue remains.
pH range : 2.9 to 4.0 (Red to yellow).
Melting point : 114° to 117°.

Dimethyl Yellow Solution : A 0.2 percent w/v solution of *dimethyl yellow* in *alcohol* (90 percent).

2, 9 Dimethyl 1, 10 Phenanthroline Solution, Alcoholic : A 0.1 percent w/v solution of *2, 9 dimethyl yellow, 1, 10 phenanthroline* in alcohol.

Diphenylamine : $(C_6H_5)_2.NH$.
Contains not less than 98.0 percent of $C_{12}H_{11}N$.
Description : White crystals; odour, slight aromatic. Discolours in light.
Solubility : Insoluble in *water*; soluble in *alcohol*, in *ether* and in *strong acids*.
Melting point : 53° to 54°.
Iron : 4 g complies with the *limit test for iron*, H.P.I., Vol. I.
Sulphated ash : Not more than 0.03 percent.
Storage : Store at a place protected from light.

Diphenylamine, Solution of : Dissolve 0.05 g of diphenylamine in a cooled mixture of 90 g of *sulphuric acid* and 10 g of *water*.

Diphenyl Benzidine: $C_{24}H_{20}N$

Description : A white or faintly grey-coloured, crystalline powder. Darkens in air and light.

Solubility : Insoluble in *water;* slightly in *alcohol*; freely in *ethyl acetate* (hot); in *toluene*.

Melting point : 246° to 250°.

Nitrate : Dissolve 25 mg in 1 ml of *hydrochloric acid*. Add cautiously 0.2 ml of this solution to 10 ml of *sulphuric acid*. No blue colour is produced.

Sulphated ash : Not more than 0.1 percent.

Ferrous Sulphate : $FeSO_4.7H_2O$

Contains not less than 97.0 percent and not more than equivalent of 103.0 percent of $FeSO_4.7H_2O$.

Description : Transparent green crystals or a pale bluish-green, crystalline powder; odourless; taste, metallic and astringent. Efflorescent in dry air. On exposure to moist air, the crystals rapidly oxydise and become coated with brownish-yellow basic ferric sulphate. When ferrous sulphate has thus deteriorated, it must not be used.

Solubility : Soluble in 1.5 parts of *water* and in 0.5 parts of *boiling water*; practically insoluble in *alcohol*.

Acidity : A solution of 5 g in 50 ml of water require for neutralisation, not more than 1.0 ml of 0.1N *sodium hydroxide* using *methyl red solution* as indicator.

Assay : Weigh accurately about 1 g and dissolve in 20 ml of *dilute sulphuric acid*. Titrate with 0.1N *potassium permanganate*. Each ml of 0.1N *potassium permanganate* is equivalent to 0.0278 g of $FeSO_4.7H_2O$.

Glycerin : $C_3H_8O_3$

Contains not less than 98.0 percent w/w of $C_3H_8O_3$.

Description : A clear colourless liquid of syrupy consistency; odourless; taste, sweet. It is hygroscopic.

Solubility : Miscible with *water* and with *alcohol*; insoluble in *chloroform*, in *ether*.

Reaction : A 10 percent w/v solution is neutral to litmus solution.

Wt. per ml : At 25°, 1.252 to 1.257 g, H.P.I., Vol. I.

Copper : To 10 ml add 30 ml of *water*, mix, add 1 ml of *dilute hydrochloric acid* and 10 ml of *hydrogen sulphide solution*, no colour is produced.

Iron : 10 g complies with the *limit test for iron*, H.P.I., Vol. I.

Heavy metals : Mix 5 g with 2 ml of 0.1N *hydrochloric acid* and *water* to make 25 ml; the *limit test of heavy metals* is 1.5 parts per million, H.P.I., Vol. I.

Sulphate : 1 ml complies with the *limit test for sulphates*, H.P.I., Vol. I.

Chloride : 1 ml complies with the *limit test for chlorides*, H.P.I., Vol. I.

Acraldehyde and glucose : Heat strongly; it assumes not more than a faint yellow and not a pink colour, heat further; it decomposes with little or no charring and with no colour of burnt sugar.

Certain reducing substances : To 5 ml in a Nessler grinder, add 5 ml of *dilute ammonia solution*, mix well and heat at 60° for five minutes. Quickly add 0.5 ml *silver nitrate solution* from a pipette keeping the tip of pipette above the mouth of the cylinder and allowing the reagent to fall directly into the solution without touching the sides of the cylinder. Mix thoroughly and keep in the dark for five minutes. Repeat the experiment with the same quantities of the same reagent in the same manner omitting the glycerin but using 5 ml of water. Compare the turbidity/colour of the two solutions in normal day light viewing them from the tops of the cylinders preferably against a white background. The turbidity or the darkening in the sample is not greater than that of the black.
Sulphated ash : Ignite 50 g and allow to burn. Cool the residue, moisten with sulphuric acid, ignite, cool, moisten again with sulphuric acid and ignite to constant weight; the residue weights not more than 5 mg.

Gold Chloride : AURUM MURITICUM OF H.P.I, Vol. I.

Gold Chloride Solution : A 2.0 percent w/v solution of gold chloride in water

Gold Leaf : Au
Description : Yellow, soft metal.
Solubility : Soluble in aqua regain, but not in individual numeral acids, also in alkali-cyanides; solutions of thiocyanates.

Guaiacol : $C_7H_8O_2$ (2-methoxyphenol)
Description : White or slightly yellow, crystalline mass; odour, characteristic; darkens on exposure to air and light.
Solubility : Sparingly soluble in *water*, in *petroleum ether*; miscible with *alcohol*, *chloroform* and *ether*.

Guaiacol Solution, Alcoholic : A 2% w/v solution of guaiacol in alcohol.

Hydrochloric Acid, Dilute (10% w/v) : Contains 10 percent w/v of Hydrochloride Acid Muriaticum of H.P.I., Vol. I.

Wt. per ml. : At 25°, 1.04 to 1.05 g, H.P.I., Vol. I.
Assay : Carry out the 'Assay' as described in H.P.I., Vol. I, using 10 g accurately weighed.

Hydrochloric Acid, Arsenic Free (AST) : Hydrochloric acid which complies with the following tests :
(i) Dilute 10 ml with sufficient *water* to produce 50 ml, add 5 ml of *ammonium thiocyanate solution* and stir immediately; no colour is produced.
(ii) To 50 ml add 0.2 ml of *bromine solution* AST, evaporate on a water-bath until reduced to 16 ml adding more *bromine solution* AST, if necessary, in order that an excess, as indicated by the colour, may be present throughout the evaporation, add 50 ml of water and 5 drops of *stannous chloride solution* AST and apply the general test, the stain

produced is not deeper than a 0.2 ml standard stain prepared with the same acid, showing that the proportion of Arsnic present does not exceed 0.05 ppm.

Hydrogen Peroxide Solution: A solution in water containing approximately 6.0 percent w/v of H_2O_2 of reagent purity.

Hydroxylamine Hydrochloride : NH_2OH, HCl.
Syn. : Hydroxylammonium Chloride.
Contains not less than 96.0 percent of NH_2OH, HCl.
Description : Colourless crystals or a white crystalline powder.
Solubility : Very soluble in water; soluble in alcohol.
Free acid : Dissolve 1 g in 50 ml of *alcohol*, add 3 drops of *dimethyl yellow solution* and titrate to a full yellow colour with 1 N *sodium hydroxide*; not more than 0.5 ml is required.
Assay : Dissolve about 0.1 g, accurately weighed, in 20 ml of water, add 5 g of *ferric ammonium sulphate* dissolved in 20 ml of *water*, add 15 ml of *dilute sulphuric acid*, boil for 5 minutes, dilute with 200 ml of *water* and titrate with 0.1N *potassium permanganate*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.003475 g of NH_2OH, HCl.

Hydroxylammonium Chloride Solution : A 6 percent w/v solution of *hydroxylammonium chloride* in water.

Iron Solution, Standard : Refers to the standard solution of iron as given in *limit test for iron*, H.P.I.,Vol. I.

Isatin : $C_8H_5NO_2$
Description : Brick red crystals or crystalline powder.
Solubility : Very slightly soluble in cold *water*, freely soluble in hot *water*, in *alcohol*, in *ether* and in *dilute ammonia solution*.
Melting point : 200° to 204°.
Sulphated ash : Not more than 0.2 percent.

Lead Chloride : $PbCl_2$
Description : White crystalline powder.
Solubility : Sparingly soluble in *water*, insoluble in *alcohol*; readily soluble in *ammonium chloride solution*.
Iron : 4 g complies with the *limit test for iron*, H.P.I.,Vol. I.

Lead Solution, Standard : Refers to the standard Lead solution as given in *limit test for lead* in H.P.I.,Vol. I.

Lead Chloride Solution, Saturated : A saturated solution of *lead chloride* in water.

Magenta : $(H_2N.C_6N)_{12}C : C_6H_3(CH_3)NH_2Cl$
Syn. : Fuchsin.
Description : A dark red powder or green crystals, with a metallic luster.
Solubility : Soluble in *water*, in *alcohol* and in *amyl alcohol*.

Clarity : 100 mg when dissolved in 20 ml of water produce a clear solution.
Loss on drying : Loses not more than 5% of its weight when dried to constant weight at 105°.
Sulphated ash : Not more than 5.0 percent.

Magenta Solution Decolourised : Dissolve 0.1 g basic magenta in 60 ml of *water* and cool in ice; add 2 g of *sodium sulphate* dissolved in 10 ml of water, cool in ice and add slowly and with constant stirring, 1 ml of *hydrochloric acid*, dilute to 100 ml. If the resulting solution is turbid, it should be filtered and if brown in colour it should be shaken with decolourising *charcoal* (0.02 to 0.04 g) to render it colourless and then filtered immediately. Occasionally it is necessary to add 0.2 to 0.3 ml of *hydrochloric acid*, followed by shaking to remove a little residual pink colour. Allow this solution to stand overnight.
Storage : Store in a dark place.

Magnesium Acetate: $(CH_2CO2)_2Mg.4H_2O$
Contains not less than 99.0 percent of $C_4H_6MgO_4.4H_2O$
Description : Small colourless or white crystals; deliquescent.
Solubility : Freely soluble in *water* and in *alcohol*.
Melting point : About 80°.
Reaction : pH of a 5.0 percent w/v solution is between 8.2 to 8.8.
Heavy metals : Not more than 10 parts per million.
Assay : Dissolve 0.8 g in 100 ml of water, add 10 ml of *strong ammonia ammonium chloride solution* and 0.5 ml of mordant black II solution. Titrate at 40° with 0.1 M *disodium edentate*, until the last trace of red colour disappears and the solution becomes pure blue. Each ml of 0.1 M *disodium edetate* is equivalent to 0.02145 g of $C_4H_6MgO_4.4H_2O$.

Magnesium Uranyl Acetate: (a) Dissolve 50 g of *uranyl acetate* in water, add 25 ml of *glacial acetic acid* and dilute with *water* to 500 ml.
(b) Dissolve 300 g of *magnesium acetae* in *water*, add 25 ml of *glacial acetic acid* and dilute to 500 ml.
Mix the two solutions (a) and (b), allow to stand overnight. Filter, if necessary.

Mercuric Chloride : MERCURIUS CORROSIVUS of H.P.I., Vol. I.

Mercuric Chloride Solution, 2 percent : A 2 percent w/v solutions of mercuric chloride in 60 percent alcohol.

Mercuric Chloride : Of H.P.I., Vol. I.

Test Solution Mordant Black II : (Colour Index No. 14645). The sodium salt of 2-(2-hydroxy-6-nitro-4-sulpho-1-naphthaylazo-1-naphthol).
Gives a wine-red colour with calcium, magnesium, zinc and certain other metals in alkaline solution. When metal ions are absent, for example, in the presence of an excess of disodium edetate, the solution is blue.

Mordant Black Mixture : Syn. : Muroxide indicator preparation.
A mixture of 0.2 percent of mordant black II with 100 parts of sodium chloride. Mordant mixture should be freshly prepared.

Beta-Naphthol : $C_{10}H_7OH$
Syn. : 2-Naphthol.
Description : White leaflets or a crystalline powder; odour, faint and resembling that of phenol. Discolours on exposure to light.
Solubility : Very slightly soluble in water; more soluble in boiling water; soluble in alcohol, in ether, in chloroform and in solutions of alkali hydroxides.
Acidity or alkalinity : Shake 1.0 g with 100 ml of water at frequent intervals during fifteen minutes and filter; the filtrate is neutral to litmus solution.
Melting point : 121° to 123°.
1-Naphthol : Boil 0.1 g in 10 ml of water until dissolved and add 1 ml of ferric chloride test solution; a white precipitate is produced, which on heating becomes brown but not violet.
Naphthalene and other organic substances : Dissolve 0.5 g in 25 ml of *dilute ammonia solution*; no residue remains and the solutions is not darker than pale-yellow.
Heavy metals : Not more than 10 parts per million.
Sulphated ash : Not more than 0.05 percent.
Storage : Store in a dark place.

Beta Naphthol Solution : Dissolve 5 g of beta naphthol, freshly re-crystallised, in 8 ml of *sodium hydroxide solution* and add sufficient water to produce 100 ml. Beta naphthol solution must be freshly prepared.

N(1 Naphthyl) Ethylenediamine Hydrochloride : $C_{12}H_{14}N_2.2HCl$
Contains not less than 95.0 percent of $C_{12}H_{14}N_2.2HCl$.
Description : A white or cream coloured powder.
Solubility : Soluble in water; sparingly soluble in alcohol.
Sulphated ash : Not more than 0.2 percent.
Assay : Carry out the *determination of nitrogen* by the following method :
Place 0.25 g and 8 ml of *nitrogen-free sulphuric acid* in a 200 ml long-necked flask and heat for 15 minutes. Add 3 g of *anhydrous sodium sulphate* and 0.3 g of *nitrogen-free mercuric oxide*. Heat the mixture over a small flame until colourless and boil gently for a further two hours. Precautions should be taken to prevent the upper part of the flask from becoming overheated. Cool, dilute 75 to 85 ml with water and a piece of *granulated zinc* and a solution of 15 g of *sodium hydroxide* and 2 g of *sodium thiosulphate* in 25 ml of water. The quantity of *sodium hydroxide* should be increased if necessary, to ensure that, before distillation, the mixture is strongly alkaline. Immediately connect the flask to a distillation apparatus, mix the contents, distil the liberated ammonia into 50 ml of 0.1N *sulphuric acid* and the excess of acid with 0.1N sodium hydroxide using *methyl red solution* as indicator. Repeat the operation without the substance being tested, the difference between the titrations represents the

ammonia liberated by the substance being tested. Each ml of 0.1N *sulphuric acid* is equivalent to 0.01296 g of $C_{12}H_{14}N_2.2HCl$.

N (1-Naphthol) Ethylenediamine Hydrochloride, Solution of : A 0.5% w/v solution of *N-(1-naphthol) ethylenediamine hydrochloride* in *water*.

Nitric Acid Fuming: HNO_3
Contains not less than 95.0 percent w/w of HNO_3.
Description : A clear, almost colourless to yellow, fuming liquid.
Wt. per ml : At 20°, about 1.5 g, H.P.I., Vol. I.
Residue on ignition : When evaporated and gently ignited to constant weight, leaves not more than 0.01 percent w/w of residue, H.P.I., Vol. I.

Oxalic Acid Solution : A 5 percent w/v solution of oxalic acid in water.

Oxalic Acid Solution, Ammoniacal : A solution of *oxalic acid* in *water* rendered slightly alkaline with *ammonium hydroxide solution*.

Petroleum Ether : Syn. : Petroleum Light (40° – 60°).
Wt. per ml : At 20°, 0.630 to 0.650, H.P.I., Vol. I.

Potassium Iodobismuthate Solution (Dragendorff's Reagent) : Dissolve 100 g of *tartaric acid* in 400 ml of water and add 8.5 g of *bismuthoxide nitrate*. Shake during one hour and 200 ml of a 40 percent w/v *potassium iodidesolution* and shake well. Allow to stand for 24 hours and filter.

Potassium Mercuri-Ioidide Solution (Mayer's Reagent) : Add 1.36 g of *mercuric chloride* dissolved in 60 ml of water to a solution of 5 g of *potassium iodide* in 20 ml of water, mix and add sufficient water to produce 100 ml.

Potassium Mercuri-Iodide, Alkaline Solution of (Nessler's Reagent) : To 3.5 g of potassium iodide add 1.25 g of *mercuric chloride* dissolved in 80ml of *water*, add a cold saturated solution of *mercuric chloride* in *water*, with constant stirring until a slight red precipitate remains. Dissolve 12 g of *sodium hydroxide* in solution, add a little more of the cold saturated solution of *mercuric chloride* and sufficient *water* to produce 100 ml. Allow to stand and decant the clear liquid.

Potassium Nitrate : KNO_3
Contains not less than 99.0 percent of KNO_3.
Description : Colourless crystals or a white crystalline powder.
Heavy metals : Dissolve 1 g in 15 ml of water and 2 ml of *dilute acetic acid*, add water to produce 25 ml, the limit of heavy metals is 10 parts per million, H.P.I., Vol. I.
Sodium : A 5 percent w/v solution tested on a platinum wire imparts no distinct yellow colour to a colourless flame.

Chloride : 1 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Sulpahte : 1 g complies with the *limit test for sulphates*, H.P.I., Vol. I.
Assay : Weigh accurately about 0.4 g and dissolve in 10 ml of *hydrochloric acid* and evaporate to dryness on a water-bath. Dissolve the residue in 10 ml of *hydrochloric acid* and re-evaporate to dryness, continuing the heating until the residue, when dissolved in water is neutral to litmus. Transfer the residue with the aid of 25 ml of water to a glass-stoppered flask and add exactly 50 ml of 0.1 N *silver nitrate*, 3 ml of *nitric acid* and 3 ml of *nitrobenzene*. Shake vigorously; add *ferric ammonium sulphate solution* and titrate the excess of *silver nitrate* with 0.1 N *ammonium thiocyanate*. Each ml of 0.1 N silver nitrate is equivalent to 0.01011 g of KNO_3.

Potassium Permanganate and Phosphoric Acid Solution : Dissolve 3 g of *potassium permanganate* in a mixture of 15 ml of phosphoric acid and 70 ml of water, add sufficient water to produce 100 ml.

Potassium Permanganate Solution, Acidic : A 1 percent w/v solution of *potassium permanganate* in water containing a few drops of *sulphuric acid*.

Potassium Plumbite Solution : Dissolve 1.7 g of lead acetate, 3.4 g of potassium citrate and 50 g of *potassium hydroxide* in sufficient water to produce 100 ml.

Rhodamine B : $C_{28}H_{31}ClN_2O_3$
Syn. : Tetraethyl rhodamine.
Description : Green crystals or reddish-violet powder.
Solubility : Very soluble in *water* and in *alcohol*; slightly soluble in *hydrochloric acid* and in *sodium hydroxide*.
Residue in ignition : Not more than 0.2 percent, H.P.I., Vol. I.

Rhodamine B Solution : A 0.2 percent w/v solution of *Rhodamine B* in *water*.

Silica Gel : SiO_2
Description : Silica Gel is amorphous, partly hydrated SiO_2. It occurs as brownish glassy granules varying in size according to particular use.
Capacity for water absorption : When Silica Gel is exposed to air of 80 percent relative humidity (sulphuric acid of Sp. Gr. 1.19 or 27 percent H_2SO_4 in a dessicator), it absorbs not less than 31 percent of its weight.
Residue on ignition : When ignited to constant weight at a temperature of 900° to 1000°, loss is not more than 6 percent of its weight, H.P.I. Vol. I.
Alcohol-ether-soluble substances : Place 5.0 g of sample in a glass-stoppered flask or cylinder, add 25 ml of a mixture of equal volumes of *alcohol* and *ether*, shake well and allow to stand for 1 hour with frequent shaking. Measure 10 ml of the liquid, filter, if necessary and evaporate in a tared vessel on a steam-bath and dry at 105° for 30 minutes. The weight of the residue does not exceed 0.05 mg.

Silver Nitrate : A 20 percent w/v solution of *silver nitrate* in *water*.

Solution 20 percent

Sodium Acetate : $CH_3CO_2Na.3H_2O$
Contains not less than 99.5 percent and not more than the equivalent of 101.0 percent of $C_2H_3NaO_2$, calculated with reference to the substance dried to constant weight at 105°.
Description : Colourless transparent crystals or white crystalline powder; odourless or with a very faint odour of acetic acid; taste, cooling, saline and slightly bitter.
Efflorescent in warm air.
Solubility : Very soluble in water; soluble in alcohol.
Identification : Yields the reactions characteristic of sodium and of acetates.
Arsenic : Not more than 2 parts per million.
Lead : Not more than 10 parts per million.
Chloride : 1 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Sulphate : 1.0 g complies with the *limit test for sulphates*, H.P.I., Vol. I.
Iron : 4.0 g complies with the *limit test for iron*, H.P.I., Vol. I.
Loss on drying : Loses not more than 40.5 percent and not less than 39.0 percent of its weight, when dried to constant weight at 130°.
Assay : Carry out the method for *non-aqueous titration* given in Appendix, using 0.4 g and *naphtholbenzein solution* as indicator, adding 5 ml of *acetic anhydride* to the solution of the substance being examined, allowing to stand for fifteen minutes before titration. Each ml of 0.1 N *per-chloric acid* is equivalent to 0.008203 g of $C_2H_3NaO_2$.

Sodium Acetate Solution, 10 percent : A 10 percent w/v solution of *sodium acetate* in *water*.

Sodium Bicarbonate, Solution, Saturated : A saturated solution of *sodium bicarbonate* in *water*.

Sodium Carbonate : $Na_2CO_3.10H_2O$
Contains not less than 99.0 percent and not more than the equivalent of 105.0 percent of $Na_2CO_3.10H_2O$, H.P.I., Vol. I.
Description : Transparent, colourless, rhombic crystals; odourless; taste, strongly alkaline, efflorescent.
Solubility : Soluble in 3 parts of water; practically insoluble in alcohol.
Note : It complies with the tests prescribed in H.P.I., Vol. I under Natrum Carbonicum.

Sodium Chloride, Solution 20 percent : A 20 percent w/v solution of *sodium chloride* in *water*.

Sodium Citrate : $C_6H_5Na_3O_7.2H_2O$
Contains not less than 99.0 percent and not more than the equivalent of 101.0 percent of $C_6H_5Na_3O_7$.
Description : White granular crystals or crystalline powder odourless; taste, cool and saline. Slightly deliquescent in moist air.
Solubility : Freely soluble in *water*; insoluble in *alcohol* (95 percent).

Identification : Yields the reactions characteristic of *sodium* and of *citrates*.
Arsenic : Not more than 2 parts per million.
Lead : Not more than 10 parts per million.
Assay : Heat 2 g until carbonised, cool and boil the residue with 50 ml of *water* and 50 ml of 0.5N *hydrochloric acid*. Filter, wash the filter with *water* and titrate the excess of acid in the filtrate and washings with 0.5N *sodium hydroxide* using *methyl orange solution* as indicator. Each ml of 0.5 N *hydrochloric acid* is equivalent to 0.04902 g of $C_6H_5Na_3O_7.2H_2O$.

Sodium Cyanide : NaCN
Contains not less than 95 percent of NaCN.
Description : Colourless granular powder; deliquescent.
Solubility : Soluble in *water*, slightly soluble in alcohol.
Chloride : 2 g complies with the *limit test for chlorides*.
Assay : Dissolve about 0.4 g accurately weighed in 30 ml of water. Add 2 drops of *potassium iodide solution* and 1 ml of *ammonium hydroxide*. Titrate with 0.1 N *silver nitrate* to a slight permanent turbidity. Each ml of 0.1 N *silver nitrate* is equivalent to 0.009801 g of NaCN.
Caution : Extremely poisonous, should be handled with care.
Storage : Should be kept in a well-closed container, protected from light, acid fumes and moisture.

Sodium Cyanide Solution : Dissolve 10 g of *sodium cyanide* in sufficient *water* to make 200 ml, filter, if necessary.

Sodium Diethyldithio-carbamate Solution : A 0.1 percent w/v solution of sodium *diethyldithiocarbamate* in *carbon tetrachloride*.

Sodium Hydroxide : NaOH
Contains not less than 95.0 percent of total alkali calculated on NaOH, and not more than 2.5 percent of Na_2CO_3.
Description : White sticks, pellets, fused masses or scales; dry, hard, brittle and showing a crystalline fracture. Very deliquescent; strongly alkaline and corrosive.
Solubility : Soluble in 1 part of *water*; freely soluble in *alcohol*.
Identification : Yields the *reactions characteristic of sodium*, H.P.I. Vol. I.
Insoluble substances and organic matter : A 5 percent w/v solution is clear and colourless.
Aluminium, iron and matter insoluble in hydrochloric acid : Boil 5 g with 50 ml of *dilute hydrochloric acid*. Cool, make alkaline with *dilute ammonia solution*, boil, filter and wash with a 2.5 percent w/v solution of *ammonium nitrate*; the insoluble residue after ignition to constant weight is not more than 5 mg.
Arsenic : Not more than 4 parts per million, H.P.I., Vol. I.
Heavy metals : Dissolve 1 g in 5 ml of water and 1 ml of *dilute hydrochloric acid*. Heat to boiling, add 1 drop of *solution of phenolphthalein* and add dropwise, sufficient *dilute ammonia solution*

to obtain a faint pink colour. Add 2 ml of *dilute acetic acid* and dilute to 25 ml with water; the limit of heavy metals is 30 parts per million, H.P.I., Vol. I.
Chloride : 0.5 g dissolved in water with the addition of 1.8 ml of *nitric acid* complies with the *limit test for chlorides*, H.P.I., Vol. I.
Potassium : Acidify 5 ml of a 5 percent w/v solution with *acetic acid* and add 3 drops of *solution of sodium cobalt nitrate*; no precipitate is formed.
Sulphates : 1 g dissolved in water with the addition of 3.5 ml of *hydrochloric acid* complies with the *limit test for sulphates*, H.P.I., Vol. I.
Assay : Weigh accurately about 2 g and dissolve in 25 ml of water, add 5 ml of *solution of barium chloride* and titrate with 1N *hydrochloric acid*, using *solution of phenolphthalein* as indicator. To the solution in the flask, add solution of *bromophenol blue* and continue the titration with 1N *hydrochloric acid*. Each ml of 1N *hydrochloric acid* used in the second titration is equivalent to 0.06911 g of K_2CO_3. Each ml of 1N *hydrochloric acid* used in the combined titrations is equivalent to 0.04 g of total alkali, calculated as NaOH.

Sodium Hydroxide Solution: Ammonia Free : On boiling, no ammonia is evolved/recognised by its odour and by its reaction on moist red litmus paper.
Complies with additional tests given for *sodium hydroxide*, H.P.I., Vol. III.

Sodium Hydroxide Solution, Nitrogen free : To 50 ml add some diphenylbenzidine, the solution is colourless or not more than very pale blue.
Complies with additional tests given for *sodium hydroxide*, H.P.I., Vol. III.

Sodium Nitrite : $NaNO_2$
Contains not less than 95.0 percent of $NaNO_2$.
Description : Colourless or slightly yellow crystals or granular powder; odourless; deliquescent.
Solubility : Freely soluble in water; sparingly soluble in alcohol (95 percent).
Chloride : 0.5 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Sulphate : 0.25 g with the addition of 3 ml of *dilute hydrochloric acid*, complies with the *limit test for sulphates*, H.P.I., Vol. I.
Heavy metals : Dissolve 1 g in 6 ml of *dilute hydrochloric acid* and evaporate to dryness on a water-bath. Reduce the residue to a coarse powder and continue heating on a water-bath until the odour of *hydrochloric acid* is no longer perceptible. Dissolve the residue in 23 ml of *water* and add 2 ml of *dilute acetic acid*; the limit of heavy metals is 20 parts per million, H.P.I., Vol. I.
Assay : Dissolve 0.5 g in sufficient water to produce 100 ml and determine by titration, the volume of the solution required to decolourise a mixture of 50 ml of 0.1N *potassium permanganate*, 5 ml of *sulphuric acid* and 100 ml of water warmed to about 40°. Each ml

of 0.1 N *potassium permanganate* is equivalent to 0.003450 g of $NaNO_2$.

Sodium Nitrite, Solution of : A 1 percent w/v solution of *Sodium nitrite* in *water*.

Sodium Nitrite, Solution of, Dilute : A 10 percent w/v solution of *sodium nitirite* in *water*.

Sodium Nitroprusside : $Na_2Fe(CN)_5NO.2H_2O$
Description : Ruby red crystals.
Solubility : Readily soluble in water.
Ferricyanide : Dissolve 1 g in 10 ml of water and add 1 ml of a 10 percent w/v *ferrous sulphate solution*; no blue colour is produced.
Ferrocyanide : Dissolve 1 g in 10 ml of water and add 0.2 ml of *ferric chloride solution*; no blue colour is produced.

Sodium Nitroprusside, Solution of : A 1.0 percent w/v solution of sodium nitroprusside in water.
Solution of sodium nitroprusside should be freshly prepared.

Sodium Plumbite Solution : Dissolve 1.2 g *lead acetate*, 3.4 g *sodium citrate* and 40 g *sodium hydroxide* in *water* sufficient to produce 100 ml.

Sodium Potassium Tartrate : $C_4H_4O_6NaK.4H_2O$
Contains not less than 99.0 percent and not more than the equivalent to 104.0 percent of $C_4H_4O_6NaK.4H_2O$.
Description : Colourless crystals or a white crystalline powder, odourless; taste, saline and cooling.
Solubility : Soluble in water, almost insoluble in alcohol.
Acidity or alkalinity : Dissolve 1 g in 10 ml of recently boiled and cooled water; the solution is not alkaline to *phenolphthalein solution* and requires not more than 0.1 ml of 0.1 N *sodium hydroxide* to produce a pink colour.
Loss on drying : When dried to constant weight at 105° for three hours, loses not less than 21 percent and not more than 28 percent of its weight.
Assay : Weigh accurately about 2 g and heat until carbonised, cool and boil the residue with 50 ml of water, add 50 ml of 0.5 N *sulphuric acid*; filter and wash the filter with water; titrate the excess of acid in the filtrate and washings with 0.5N *sodium hydroxide*, using *methyl orange solution* as indicator. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.07055 g of $C_4H_4O_6NaK.4H_2O$

Sodium Sulphate, Anhydrous : Sodium sulphate rendered anhydrous by heat and complies with the requirements of *sodium sulphate*.

Sodium Tartrate : $Na_2C_4H_5O_6.2H_2O$
Contains not less than 84.34 percent of $Na_2C_4H_4O_6$
Description : White crystals or granules.
Solubility : Soluble in 3 parts of cold water, 1.5 parts of boiling water; insoluble in alcohol.

Alkalinity : The aqueous solution is slightly alkaline to litmus, pH 7 to 8.

Sodium Thiosulphate Solution : A 10 % w/v *solution of sodium thiosulphate* in *water*.

Sodium Tungstate : $Na_2WO_4.2H_2O$
Description : Colourless crystals or a white crystalline powder.
Solubility : Readily soluble in water.
Reaction : pH of a 2 percent w/v solution in recently boiled and cooled *water*, 8.0 to 9.0.
Nitrate : Dissolve 1 g in 10 ml of water, add 1 ml of *indigo carmine solution* and 10 ml of *sulphuric acid-nitrogen free* and heat to boiling; the blue colour is not entirely discharged.
Residue on ignition : When ignited to constant weight, loses not less than 10.5 percent and not more than 11.5 percent of its weight, H.P.I., Vol. I.

Sucrose : $C_{12}H_{22}O_{11}$
Description : Colourless crystals or white granules; odourless; taste, sweet.
Solubility : Very soluble in *water*; sparingly soluble in *alcohol*.
Specific rotation : +66.4° to +66.8°.
Heavy metals : Not more than 5 parts per million.
Iron : 8 g complies with the *limit test for iron*.
Sulphated ash : Not more than 0.02 percent.

Sucrose Solution : A 10.0 percent w/v solution of *sucrose* in *water*.

Sulphuric Acid (1 percent V/V) : Mix 1 volume of *sulphuric acid* with 99 volumes of water.

Sulphuric Acid (25 percent V/V) : Mix 2 volumes of *sulphuric acid* with 8 volumes of *water* and cool.

Sulphuric Acid (50 percent V/V) : Mix equal volumes of *sulphuric acid* and *water* and cool.

Tannic Acid, Solution of : A 10 percent w/v solution of *tannic acid* in *water*.

Urea : NH_2CONH_2
Contains not less than 99.5 percent and more than the equivalent of 100.5 percent of CH_4ON_2.

Description : Colourless to white, prismatic crystals or a white crystalline powder; odourless, but on longer standing, develops odour of ammonia; taste, cooling and saline.
Solubility : Soluble in 1.5 parts of *water*, 10 parts of *alcohol*; practically insoluble in *chloroform* and in *solvent ether*.

Melting range : 132° to 134°, H.P.I., Vol. I.
Reaction : Its solutions are neutral to litmus.
Sulphated ash : Not more than 0.1 percent.

Assay : Weigh accurately about 1.07 g and transfer to a 300 ml long-necked flask. Add 25 ml of water, 2 ml of a 3 percent w/v *copper sulphate solution* and 8 ml of *sulphuric acid*. Heat gently for fifteen minutes so that copious fumes are evolved, cool and slowly add 100 ml of water and 0.2 g of *granulated zinc*. Connect the flask to an ammonia distillation apparatus. The delivery tube of the apparatus should be dipped in 50 ml of 2 percent w/v solution of *boric acid*. Heat the flask and when the air is driven out, add slowly 75 ml of *sodium hydroxide solution*. Distil and collect the ammonia. Titrate the distillate with 0.2N *hydrochloric acid*, using *methyl red solution* as indicator. Repeat the experiment with the same quantities of the same reagents in the same manner omitting urea. The difference between the titrations represent the amount of ammonia evolved from urea. Each ml of 0.2N *hydrochloric acid* is equivalent to 0.006006 g of CH_4ON_2.

Zinc Sulphate : $ZnSO_4.7H_2O$
Contains not less than 55.6 percent and not more than 61.0 percent of $ZnSO_4$, corresponding to not less than 99.5 percent and not more than the equivalent of 102.0 percent of the hydrated salt, $ZnSO_4.7H_2O$.

Description : Colourless, transparent crystals or a crystalline powder; odourless, taste astringent and metallic.

Solubility : Soluble in 0.6 parts of *water*; practically insoluble in *alcohol*; soluble in 2.5 percent of *glycerin*.

Aluminium, Copper, Magnesium and Nickel : Dissolve 1 g in 20 ml of water, add *dilute ammonia solution* in excess and allow to stand. The solution remains colourless and no precipitate is produced within thirty minutes.

Assay : Weigh accurately about 1 g and dissolve in about 100 ml of water. Heat the solution to about 90° and add *sodium carbonate solution* to precipitate all of the zinc, taking care to avoid a large excess of *sodium carbonate*. Boil for about five minutes and set aside to allow the precipitate to subside. Collect the precipitate in a tared gooch crucible and wash with hot water until free from alkali. Dry the residue, ignite and weigh. Each g of residue is equivalent to 1.984 g of $ZnSO_4$.

Zinc Sulphate Solution, Saturated : A saturated solution of *zinc sulphate* in *water*.

APPENDIX—II

SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Acetic Acid, 1N : Dilute 57.5 ml of the *glacial acetic acid* with *water* sufficient to produce 1000 ml.

Bromine 0.1 N : Dissolve 3 g *potassium bromate* and 15 g of *potassium bromide* in sufficient *water* to produce 1000 ml. Ascertain its exact strength by adding *potassium iodide* and a slight excess of *hydrochloric acid* and titrating with 0.1 N *sodium thiosulphate*. 0.1 N *Bromine* should be kept in a dark amber-coloured stoppered bottle.

Hydrochloric Acid, 0.02 N, 0.05 N : *Hydrochloric acid*, diluted with water to contain in 1000 ml, the following quantities of HCl.

For 0.02 N	0.7293 g HCl
For 0.05 N	1.823 g HCl

Magnesium sulphate, 0.05 M : Dissolved 12.324 g of *magnesium sulphate* in *water* sufficient to produce 1000 ml.

APPENDIX—III

INDICATORS EMPLOYED IN VOLUMETRIC DETERMINATIONS AND IN pH DETERMINATIONS

Crystal Violet, Solution of : A 0.5 percent w/v solution of *crystal violet* in *glacial acetic acid*.

Catechol Violet Solution : Dissolve 0.1 g in *water* and dilute with *water* sufficient to produce 100 ml.

1-Naphthol Benzene Solution : A 0.2 percent w/v solution of *1-naphthol benzene* in *glacial acetic acid.* When used for titration in non-aqueous media, it changes from blue or green-blue (basic) through orange (neutral) to dark green (acidic).

1, 10 Phenanthroline Solution : A 0.2 % w/v solution of *1, 10 phenanthroline* in *alcohol*.

APPENDIX—VB*

DETERMINATION OF OPTICAL ROTATION AND OF SPECIFIC ROTATION

Optical Rotation : Certain substances, in a pure state, in solution and in tinctures posses the property of rotating the plane of polarised light, i.e., the incident light emerges in a plane forming an angle with the plane of the incident light. These substances are said to be optically active and the property of rotating the plane of polarised light is known as Optical Rotation. The optical rotation is defined as the angle through which the plane of polarised light is rotated, when polarised light obtained from sodium or mercury vapour lamp passes through one decimeter thick layer of a liquid or a solution of a substance at a temperature of 25° unless as otherwise stated in the monograph. Substances are described as dextrorotatory or laevorotatory according to the clockwise or anticlockwise rotation respectively of the plane of polarised light. Dextrorotation is designated by a plus (+) sign and laevorotation by a minus (—) sign before the number indicating the degrees of rotation.

Apparatus : A polarimeter on which angular rotation accurate 0.05° can be read may be used.

Procedure : For liquid substances, take a minimum of five readings of the rotation of the liquid and also for a empty tube at the specified temperature. For a solid dissolve in a suitable solvent and take five readings of the rotation of the solution and the solvent used. Calculate the average of each set of five readings and find out the correct optical rotation from the observed rotation and the reading with the blank (average).

Specific Rotation : The apparatus and the procedure for this determination are the same as those specified for optical rotation.

Specific rotation is denoted by the expression

$$[\alpha]_{x}^{t}$$

denotes the temperature of rotation; α denotes the wave length of light used or the characteristic spectral line. Specific rotations are expressed in terms of sodium light of wave length 589.3 mw (D line) and at a temperature of 25°, unless otherwise specified.

Specific rotation of a substance may be calculated from the following formulae:

For liquid substances

$$[\alpha]^{t} = \frac{a}{ld}$$

For solutions of substances

$$[\alpha]^{t} \leftrightarrow = \frac{a \times 100}{l\,c}$$

Where a is the corrected observed rotation in degrees
1 is the length of the polarimeter tube in decimeters.
d is the specific gravity of the liquid
c is the concentration of solution expressed as the number of g of the substance in 100 ml of solution.

Specific Rotation : ***1. Apomorphinum muriaticum***

Determined in a solution containing the equivalent of 0.15 g of anhyd. Apomorphine in 10 ml of 0.02 N HCl. The optical rotation should be not less than 49° and not more than 51° H.P.I., Volume III, 24.

2. Chinium muriaticum

Dissolve 0.5 g in 0.1 N hydrochloric acid and dilute to 25 ml with the same solvent. The optical rotation should be not less than –240° and not more than –258°.

3. Codeinum

Dissolve 0.5 g in alcohol and dilute to 25 ml with the same solvent. The optical rotation should be in between –142° and –146°.

Optical Rotation : *Copaiba Officinalis*—Essential oil—optical rotation should be in between –7° and –35°.

(C) DETERMINATION OF LIGHT ABSORPTION

When radiation is passed through a homogeneous solution containing an absorbing substance, part of the radiation is absorbed and the intensity of the radiation emerging from the solution is less than the intensity of the radiation entering it. The extent to which radiation absorbed in passing through a layer of an absorbing substance is expressed in terms of the extinction, E, defined by the

$$E = \log_{10} \frac{(I_0)}{I}$$

expression, where I_0 is the intensity of the radiation entering the absorbing layer I, is the intensity of the radiation emerging from the absorbing layer.

The extent of absorption in case of each absorbing substance depends on its concentration in the solution and the thickness of the absorbing layer taken for measurement. For convenience of reference and for each in calculations, the Extinction of a 1 cm layer of a 1 percent w/v solution of the substance has been given in this pharmacopoeia in the case of a few substances. For each absorbing substance there is one wavelength or there are a few wavelengths, at which maximum absorptions take place and the values differ from one wavelength to another. It is therefore necessary to specify the wavelength at which the measurement is made. The composite method of expression is thus—

$$E(1\ \text{percent}, 1\ \text{cm}) \text{ at } \mu$$

The quantitative relationship between this value and the extinction determined (for the same wavelength) at other concentrations is given by the formula

$$E(1\ \text{percent}, 1\ \text{cm}) = \frac{E}{lc}$$

Where E is the observed extinction of a solution, l is the thickness in cm of the absorbing layer of the solution, c is the number of groups of the absorbing substance in 100 ml of solution. This property of light absorption is at times utilised for identifying substances and assays where solutions are obtained, free from interfering materials and simpler methods were not found satisfactory.

The measurement of light absorption is made with spectrophoto-meters. The wavelength at which measurement is to be made may be in the visible or in the ultra-violent region as specified in the main text of the monograph. An instrument should be used which is suitable for the desired wavelength. Care should be taken to see that the solvent used for making solutions is free from fluorescence at the desired wavelength or wavelengths. The solvent which is used in the solvent cell must be from the same batch as the one used for preparing the solution for test.

***(A) Determination of Refractive Index prescribed in the H.P.I. Volume I, as may be read as Appendix V A.**

APPENDIX—VII

QUALITATIVE REACTIONS OF SOME COMMON SUBSTANCES AND RADICALS

1. *Benzoates* :

Benzoates do not char when heated with *sulphuric acid* but yield a white sublimate on the sides of the tube.

Solutions of benzoates yield a white crystalline precipitate with *dilute hydrochloric acid* readily soluble, on shaking in *solvent ether* or *chloroform*.

Neutral solutions of benzoates yield with *test-solution of ferric chloride* a buff coloured precipitate which is soluble in *hydrochloric acid* with the simultaneous separation of a white crystalline precipitate of *benzoic acid*.

Neutral solutions of benzoates do not decolorise a few drops of *solution of bromine*.

2. *Bromides* :

When a bromide is heated with *sulphuric acid* and *manganese dioxide* or *potassium dichromate*, *bromine* is liberated; the vapour gives an orange-yellow colour to filter-papers moistured with *solution of starch*.

Solutions of bromides give, with solution of *silver nitrate*, a yellowish curdy precipitate somewhat soluble in *ammonia solution* but almost insoluble in *dilute ammonia solution* and *dilute nitric acid*.

From solutions of bromides, bromine is liberated by *solution of chlorine*. The bromine is soluble in two or three drops of *Carbon disulphide* or *chloroform* forming a reddish solution. Addition of a saturated solution of *phenol* to the aqueous solution containing liberated bromine yields a white precipitate.

In testing for bromides in the presence of iodides, all *iodine* must first be removed by boiling the aqueous solution with excess of Lead dioxide.

3. *Citrates* :

Citrates, on heating with *sulphuric acid* in a tube placed in a boiling water-bath, give only a pale yellow colour and evolve carbon dioxide and carbon-monoxide.

Neutral solutions of citrates boiled with an excess of *solution of calcium chloride* yield a white granular precipitate soluble in *acetic acid*.

Neutral solutions of citrates yield, with an excess of *solution of silver nitrate* a white precipitate soluble in *nitric acid* and in *dilute ammonia solution*. No mirror is formed on the sides of the test tube when this ammoniacal solution is warmed.

Solution of citrates boiled with an excess of *solution of mercuric sulphate* and filtered if necessary, yield a solution which after boiling and addition of a few drops of *solution of potassium permanganate*, decolourises the reagent and yields a white precipitate.

Evaporation Residue for Benzene : **-**

Evaporate 115 ml on the steam-bath and dry at 105° for 30 minutes. The weight of the residue does not exceed 1.0 mg.

4. *Oxalates* :

Neutral and alkaline solutions of *oxalates* yield a white precipitate with *calcium chloride.* This precipitate is insoluble in *acetic acid* but is dissolved by *hydrochloric acid.* Hot acidified solution of oxalates decolarised *potassium permanganate*.

5. *Sulphides* :

When treated with *dilute sulphuric acid*, sulphides yield *hydrogen sulphide*, recognisable by its characteristic pungent odour.

6. *Cadimum compounds* :

Cadmium salts yield with *hydrogen sulphide* or *potassium sulphide*, a yellow precipitate, insoluble is excess of *sodium sulphide*.

APPENDIX—XXI

METHOD FOR DETERMINATION OF ALCOHOL CONTENT IN HOMOEOPATHIC TINCTURES

Alcohol content of homoeopathic tinctures should be carried out by the method as directed against the individual drug using the suggested apparatus. The apparatus employed consists of a round-bottomed 500 ml flask (A) fitted with a distillation head (B) with a steam trap and attached to a vertical condenser (C) (see figure). The latter is fitted as its lower part with a tapered tube (D) which carries the distillate into a 100 ml or 200 ml volumetric flask. The volumetric flask is immersed in a water-ice mixture (E) during the distillation. A disc having a circular aperture 6 cm in diameter is placed under the flask (A) to reduce the risk of charring of any dissolved substances.

Method I :

Transfer 25.0 ml of the tincture measured at 25° to the distillation flask. Dilute with 100 to 150 ml of water and add a few pieces of pumica. Attach the distillation head and condenser. Distil and collect not less than 90 ml of the distillate in a 100 ml volumetric flask. Adjust the temperature at 25° and dilute with water at 25° to 100 ml. Determine the specific gravity at 25° with a specific gravity bottle or a pycnometer.

Read out the percentage v/v of the alcohol from the table.

When the distillate contains steam-volatile substances other than alcohol, it will be usually then turbid or contain oily drops, proceed by Method III. When steam volatile acids are present make the solution just alkaline with 1N *sodium hydroxide*, using solid *phenolphthalein* as indicator before final distillation.

Method II :

Transfer 25.0 ml of the tincture to a separating funnel, add another 100 ml of water. Saturate the solution with sufficient amount of sodium chloride. Add about 100 ml of *petroleum ether* (40 to 60°) and shake vigorously for two to three minutes. Allow the mixture to stand for 15 to 30 minutes and run the lower layer into a distillation flask. Wash the light petroleum in the separating funnel by shaking vigorously with two quantities each of about 25 ml of saturated *solution of sodium chloride*. Run the washings into the flask. Make the mixture alkaline with 1N *sodium hydroxide* using *solid phenolphthalein* as indicator, add a little pumica powder, 100 ml of water and determine the amount of ethyl alcohol by Method I, commencing at the words “Attach the distillation head…..”.

Method III :

Transfer 25 ml of the tincture to the distillation flask. Dilute with 100 to 150 ml of water and add a little pumica powder. Connect the distillation head, condenser and distil about 100 ml. Transfer to a separating funnel and determine the content of *ethyl alcohol* by Method II commencing at the words “Saturate the solution with…”.

Final distillate should be free from Methanol and Isopropanol.

Test for Methanol *:*

Adjust the distillate to a content of about 10 percent v/v of *ethyl alcohol* by diluting with water or by the addition of 90 percent v/v *alcohol*. To 5 ml of the solution add 2 ml of *potassium permanganate* and *phosphoric acid solution*. Allow to stand for 10 minutes and add 2 ml of *oxalic acid* and *sulphuric acid solution*. The solution is colourless. Add 5 ml of decolourised fuchsine solution and allow to stand for 30 minutes at a temperature between 15° and 30°. No colourisation is produced.

Test of Isopropanol *:*

To 1 ml of distillate, add 2 ml of *mercuric sulphate solution* and heat to boiling. No precipitate is formed.

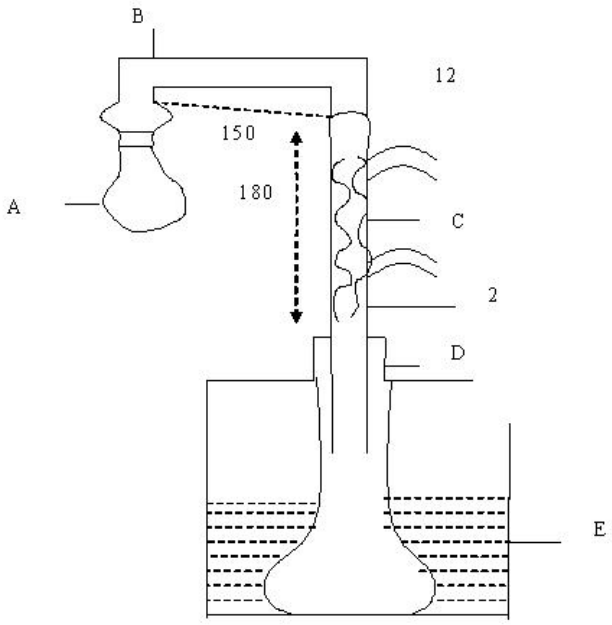


Figure. Apparatus for Determination of Alcohol Content (Dimensions in mm)

TABLE – I

Relative density of the distillate, measured in air	Ethanol content (percent v/v) of the preparation at 20º
0.9710	95.75
0.9720	92.15
0.9730	88.52
0.9740	84.80
0.9750	81.09
0.9760	77.29
0.9770	73.50
0.9780	69.78
0.9790	66.10
0.9800	62.47
0.9810	58.88
0.9820	55.33
0.9830	51.77
0.9840	48.34
0.9850	44.98
0.9860	41.62
0.9870	38.31
0.9880	35.03
0.9890	31.80
0.9900	28.60
0.9910	25.49
0.9920	22.45
0.9930	19.46
0.9940	16.58
0.9950	13.70
0.9960	10.87
0.9970	8.11
0.9980	5.39
0.9990	2.68
1.0000	0.00

TABLE - II

Table of corrections to be applied to the apparent ethanol content in respect of the temperature.

Temp.t°		Ethanol content (percent v/v) at temperature t°												
		0	1	2	3	4	5	6	7	8	9	10	11	12
16°	to be	0.42	0.43	0.45	0.46	0.48	0.50	0.53	0.55	0.58	0.62	0.66	0.71	0.76
17°	added	0.32	0.33	0.34	0.35	0.37	0.39	0.11	0.43	0.46	0.48	0.51	0.55	0.58
18°		0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.30	0.231	0.33	0.34	0.36	0.39
19°		0.11	0.12	0.12	0.13	0.13	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.20
20°	----------													
21°	to be		0.13	0.13	0.13	0.14	0.14	0.15	0.13	0.16	0.17	0.18	0.19	0.2
22°	subtracted		0.26	0.27	0.28	0.28	0.29	0.30	0.32	0.34	0.35	0.37	0.40	0.42
23°			0.41	0.42	0.43	0.44	0.45	0.47	0.49	0.51	0.54	0.56	0.60	0.63
24°			0.56	0.57	0.58	0.59	0.61	0.64	0.67	0.70	0.73	0.77	0.81	0.85
25°			0.71	0.72	0.73	0.75	0.78	0.81	0.84	0.89	0.93	0.98	1.02	1.07
26°			0.86	0.88	0.91	0.98	0.96	1.00	1.04	1.09	1.14	1.19	1.24	1.30
27°				1.05	1.08	1.10	1.14	1.18	1.23	1.28	1.34	1.40	1.46	1.53
28°				1.22	1.25	1.23	1.33	1.38	1.44	1.50	1.56	1.62	1.68	1.75
29°				1.40	1.44	1.48	1.52	1.58	1.64	1.71	1.78	1.85	1.92	2.00
30°				1.59	1.62	1.66	1.71	1.77	1.85	1.93	2.00	2.07	2.15	2.23

TABLE - II (Contd.)

Table of corrections to be applied to the apparent ethanol content in respect of the temperature.

Temp. tº		Ethanol content (percent v/v) at temperature tº												
		13	14	15	16	17	18	19	20	21	22	23	24	25
16º	to be	0.82	0.88	0.94	1.01	1.08	1.15	1.20	1.26	1.31	1.36	1.40	1.45	1.49
17º	added	0.63	0.67	0.71	0.76	0.81	0.85	0.90	0.95	0.99	1.02	1.06	1.09	1.12
18º		0.42	0.45	0.47	0.50	0.53	0.56	0.60	0.63	0.65	0.68	0.70	0.72	0.75
19º		0.22	0.25	0.24	0.26	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36
20º	----------													
21º	to be	0.21	0.23	0.24	0.26	0.28	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37
22º	sub-	0.44	0.46	0.48	0.51	0.54	0.57	0.60	0.62	0.65	0.67	0.69	0.71	0.73
23º	tracted	0.67	0.71	0.74	0.78	0.82	0.86	0.90	0.94	0.98	1.09	1.03	1.06	1.08
24º		0.89	0.94	0.99	1.04	1.09	1.14	1.21	1.27	1.31	1.35	1.38	1.42	1.46
25º		1.12	1.18	1.24	1.32	1.38	1.44	1.51	1.60	1.65	1.69	1.72	1.76	1.81
26º		1.36	1.43	1.51	1.57	1.65	1.73	1.82	1.90	1.97	2.02	2.06	2.12	2.18
27º		1.60	1.68	1.76	1.85	1.93	2.02	2.12	2.22	2.30	2.36	2.42	2.47	2.53
28º		1.83	1.92	2.02	2.11	2.21	2.31	2.43	2.54	2.63	2.70	2.70	2.83	2.90
29º		2.08	2.17	2.28	2.39	2.50	2.62	2.73	2.85	2.96	3.05	3.11	3.18	3.25
30º		2.33	2.45	2.55	2.67	2.79	2.91	3.04	3.16	3.28	3.38	3.46	3.54	3.61

METHOD TO BE FOLLOWED

Volume - I

			Limits
1.	Abroma Augusta	I	42-46%
2.	Abrotanum	I	72-76%
3.	Acalypha Indica	I	57-61%
4.	Aconite Napellus	I	61-65%
5.	Aesculus Hippocastanum	I	57-61%
6.	Aethusa Cynapium	III	57-61%
7.	Agaricus Muscarius	I	41-45%
8.	Agnus Castus	I	87-91%
9.	Allium Cepa	III	41-45%
10.	Allium Sativa	III	66-70%
11.	Aloe Socotrina	I	87-91%
12.	Ambra Grisea	I	91-95%
13.	Amyl Nitrosum	II	82-86%
14.	Anacardium Orientale	I	87-91%
15.	Andrographis Paniculata	I	57-61%
16.	Apis Mellifica	I	37-41%
17.	Apocynum Cannabinum	I	57-61%
18.	Aralia Racemosa	I	79-83%
19.	Arnica Montana	I	57-61%
20.	Arsenic Album	I	8-95%
21.	Artemisia Vulgaris	I	61-66%
22.	Arum Triphyllum	I	57-61%
23.	Asafoetida	III	87-91%
24.	Avena Sativa	I	57-61%
25.	Azadirachta indica	I	57-61%
26.	Baptisia Tinctoria	I	63-67%
27.	Belladonna	I	41-45%
28.	Bellis Perennis	I	61-65%
29.	Berberis Vulgaris	I	47-51%
30.	Blatta Orientalis	I	87-91%
31.	Boerhaavia Diffusa	I	57-61%
32.	Bovista	I	57-61%
33.	Bryonia Alba	I	57-61%
34.	Cactus Grandiflorus	I	68-72%
35.	Calendula Officinalis	I	38-42%
36.	Calotropis Gigantia	I	66-70%
37.	Camphora	II	80-84%
38.	Cannabis Indica	I	77-81%
39.	Cannabis Sativa	I	66-70%
40.	Cantharis	I	87-91%
41.	Carduus Marianus	I	47-51%
42.	Caulophyllum Thalictroides	I	47-51%
43.	Causticum	I	44-48%

44.	Ceanothus Americanus	I	57-61%
45.	Chamomilla	III	47-51%
46.	Cheidonium Majus	I	41-45%
47.	Cicuta virosa	I	47-51%
48.	Cimicifuga Racemosa	I(a)	58-62%
49.	Cina	I	87-91%
50.	Cinchona Officinalis	I	75-79%
51.	Coculus Indicus	I	87-91%
52.	Coffea Cruda	I	89-93%
53.	Colchicum Autumnale	I	47-51%
54.	Colocynthis	I	47-51%
55.	Conium Maculatum	III	57-61%
56.	Crataegus Oxycantha	I	57-61%
57.	Croton Tiglium	I	91-95%
58.	Digitalis Purpurea	I	41-45%
59.	Dioscorea Villosa	I	57-61%
60.	Drosera Rotundifolia	I	57-61%
61.	Dulcamara	I	62-66%
62.	Echinacea Angustifolia	I	75-79%
63.	Eupatorium Perfoliatum	III	47-51%
64.	Euphrasia Officinalis	I	57-61%
65.	Ficus Religiosa	I	69-73%
66.	Gelsemium Sempervirens	I	57-61%
67.	Geranium Maculatum	I	57-61%
68.	Gymnema Sylvestre	I	76-80%
69.	Hamamelis Virginica	I	57-61%
70.	Helleborus Niger	I	57-61%
71.	Holarrhena Antidysenterica	I	54-58%
72.	Hydrastis Canadensis	I	57-61%
73.	Hydrocotyle Asiatica	I	66-70%
74.	Hyoscyamus Niger	I	52-56%
75.	Hypericum Perforatum	I	71-75%
76.	Ignatia Amara	I	77-81%
77.	Iodium	I(b)	91-95%
78.	Ipecacuanha	III	72-76%
79.	Janosia Ashoka	I	82-86%
80.	Justicia Adhatoda	I	82-86%
81.	Kali Iodatum	I(b)	54-60%
82.	Kreasotum	II	82-86%
83.	Ledum Palustre	I	76-80%
84.	Lycopodium Clavatum	I	91-95%
85.	Mezerum	I	75-79%
86.	Myrica Cerifera	I	72-76%
87.	Nux Moschata	III	87-91%
88.	Nux Vomica	I	72-76%
89.	Ocimum Sanctum	III	72-76%
90.	Opium	I	47-51%
91.	Petroleum	III	87-91%

92.	Phosphorus	I	91-95%
93.	Phytolacca Decandra	I	57-61%
94.	Podophyllum Peltatum	I	61-65%
95.	Pulsatilla Nigricans	I	66-70%
96.	Psoralia Corylifolia	III	91-95%
97.	Rauvolfia Serpentina	I	75-79%
98.	Rhus Toxicodendron	I	75-79%
99.	Ruta Graveolens	III	66-70%
100.	Sabadilla	I	75-79%
101.	Sabina	III	82-86%
102.	Sanguinaria Canadensis	I	57-61%
103.	Secale Cornutum	I	44-48%
104.	Senega	I	47-51%
105.	Spongia Tosta	I	75-79%
106.	Staphysagria	I	87-91%
107.	Sulphur	I	91-95%
108.	Syzygium Jambolanum	I	82-86%
109.	Tabacum	III	75-79%
110.	Terminalia Arjuna	I	77-81%
111.	Thuja Occidentalis	III	80-84%
112.	Tribulus Terrestris	I	58-62%
113.	Veratrum Viride	I	72-76%
114.	Withania Somnifera	I	72-76%

Volume—II

1.	Abies Canadensis	III	72-76%
2.	Absinthium	III	63-67%
3.	Acidum Benzoicum	I	91-95%
4.	Acidum Carbolicum	II	91-95%
5.	Acidum Picricum	I	91-95%
6.	Acidum Salicylicum	I	91-95%
7.	Adonis Vernalis	I	48-52%
8.	Aletris Farinosa	I	57-61%
9.	Alfalfa	I	64-68%
10.	Apium Graveolens	III	91-95%
11.	Aranea Diadema	I	65-69%
12.	Asarum Canadensis	III	57-61%
13.	Capsicum Annum	III	87.5-91.5%
14.	Carbonium Sulphuratum	II	44.5-48.5%
15.	Carica Papaya	I	57-61%
16.	Cascara Sagrada	I	57-61%
17.	Chenopodium Anthelminticum	III	67-71%
18.	Chimaphilla Umbellata	I	66-70%
19.	Chloralum	II	91-95%
20.	Cinnamomum	III	91-95%
21.	Coca	I	48-52%
22.	Coccus Cacti	I	48-52%

23.	Collinsonia Canadensis	I	48-52%
24.	Convallaria Majalis	I	57-62%
25.	Crocus Sativus	I	91-95%
26.	Cundurango	I	48-52%
27.	Cynodon Dactylon	I	57-61%
28.	Damiana	I	57-61%
29.	Embelia Ribes	I	57-61%
30.	Eucalyptus Globulus	III	83-87%
31.	Equisetum Hyemale	I	57-61%
32.	Filix Mas	I(a)	73-77%
33.	Glonoinum	II	88-92%
34.	Gossypium Herbaceum	I	38.5-42.5%
35.	Guaiacum	II	91-95%
36.	Iris Versicolor	III	57-61%
37.	Jaborandi	III	91-95%
38.	Jalapa	I	91-95%
39.	Juniperus Communis	III	79-83%
40.	Lobelia Inflata	III	66-70%
41.	Melilotus Alba	I	48-52%
42.	Mentha Piperita	III	57-61%
43.	Menyanthes Trifoliata	I	57-61%
44.	Moschus	III	47-51%
45.	Oleum Santali	III	82.5-86.5%
46.	Passiflora Incarnata	I	57-61%
47.	Physostigma Venenosum	I	91-95%
48.	Plantago Major	I	62-66%
49.	Ratanhia	I	48-52%
50.	Rheum	I	57-61%
51.	Rhododendron Chrysanthum	I	75-79%
52.	Rhus Venenata	I	75-79%
53.	Rumex Crispus	I	57-61%
54.	Sabal Serrulata	I	47-51%
55.	Salix Nigra	I	47-51%
56.	Sambucus Nigra	I	47-51%
57.	Senecio Aureus	I	47-51%
58.	Solanum Nigrum	I	57-61%
59.	Stramonium	I	57-61%
60.	Strophanthus Hispidus	I	91-95%
61.	Sumbul	I	75-79%
62.	Spigelia	I	75-79%
63.	Tarentula Hispana	I	44.5-48.5%
64.	Terebinthinae Oleum	III	91-95%
65.	Terminalia Chebula	I	57-61%
66.	Tinospora Cordifolia	I	45-49%
67.	Valeriana Officianalis	III	48-52%
68.	Verbascum Thapsus	III	48-52%
69.	Veratrum Album	I	75-79%
70.	Viburnum Opulus	I	57-61%

71.	Vibrunum Prunifolium	I	57-61%
72.	Viscum Album	I	75-79%
73.	Zingiber	III	89-93%

Volume—III

1.	Acidum Butyricum	I(a)	63-67%
2.	Acidum Citricum	I(a)	91-95%
3.	Acidum Oxalicum	I(a)	91-95%
4.	Acidum Tannicum	I(a)	89-93%
5.	Amygdalus Amara	I	48-52%
6.	Angustura	I	66-70%
7.	Anilinum	II	91-95%
8.	Anthemis Nobilis	III	66-70%
9.	Antipyrinum	II	91-95%
10.	Apocynum Androsaemifolium	I	57-61%
11.	Apomorphinum Muriaticum	I(a)	90-94%
12.	Aristolochia Serpentaria	III	57-61%
13.	Asclepias Tuberosa	I	57-61%
14.	Badiaga	I	91-95%
15.	Balsum Peru	III	91-95%
16.	Benzenum	III	91-95%
17.	Berberis Aquifolium	I	66-70%
18.	Calcarea Aceticum	I(a)	90-94%
19.	Cascarilla	I	91-95%
20.	Castanea Vesca	I	48-52%
21.	Castroreum	I	91-95%
22.	Chionanthus Virginica	I	57-61%
23.	Chochlearia Armoracia	III	57-61%
24.	Copaiba Offcianalis	I	91-95%
25.	Cornus Florida	I	57-61%
26.	Cubeba Officinalis	III	91-95%
27.	Dolichos	I	91-95%
28.	Eriodictym Glutinosum	I	75-79%
29.	Euonymus Atropurpurea	I	73-77%
30.	Euphorbia Resinifera	I	91-95%
31.	Fucus Vesiculosus	I	57-61%
32.	Gambogia	I	91-95%
33.	Gentiana Lutea	I	48-52%
34.	Ginseng	I	91-95%
35.	Granatum	I	48-52%
36.	Grindelia Robusta	I	80-84%
37.	Haemotoxylon Campechianum	I	48-52%
38.	Helonias Dioica	I	57-61%
39.	Hydrangea Arborescens	I	57-61%
40.	Illicium Anisatum	III	91-95%
41.	Inula (Helenium)	III	80-84%
42.	Lappa Major	III	57-61%
43.	Leptandra	I	57-61%

44.	Lupulus	III	91-95%
45.	Mygale	I	47-51%
46.	Nyctanthes Arbortristis	I	57-61%
47.	Oleander	III	57-61%
48.	Pareira Brava	I	66-70%
49.	Piper Methysticum	III	91-95%
50.	Piper Nigrum	III	91-95%
51.	Piscidia	I	75-79%
52.	Populus Candicans	I	66-70%
53.	Prunus Virginiana	I	57-61%
54.	Rhamnus Frangula	I	75-79%
55.	Ricinus Communis	I	91-95%
56.	Salix Purpurea	I	48-52%
57.	Sarsaparilla	I	48-52%
58.	Scutellaria	I	48-52%
59.	Senna	I	48-52%
60.	Sinapis Alba	I	91-95%
61.	Sinapis Nigra	I	91-95%
62.	Squillia	I	57-61%
63.	Stillingia Sylvatica	I	57-61%
64.	Symphytum Officinale	I	48-52%
65.	Taraxacum	I	48-52%
66.	Taxas Baccata	I	80-84%
67.	Theridion	I	44.5%
68.	Tongo	I	91-95%
69.	Triticum Repens	I	57-61%
70.	Ustilago Maydis	I	57-61%
71.	Uva Ursi	I	57-61%
72.	Xanthoxylum Fraxineum	III	73-77%

INDEX

A

Acanthia Iectularia
Acetanilidum
Acetic Acid
Acetic Acid 1N
Acetone
Acidum Boracicum
Acidum Butyricum
Acidum Citricum
Acidum Gallicum
Acidum Hydrocyanicum
Acidum Lacticum
Acidum Nitro-Muriaticum
Acidum Oxalicum
Acidum Sulphurosum
Acidum Tannicum
Acidum Tartaricum
Agropyrum repens
Alcohol 60 percent
Aldar Buckthora
Aluminium Wire
Ammonia Solution, standard
Ammonia Ammonium Chloride Buffer Solution
Ammonium Benzoate
Ammonium Benzoicum
Ammonium Bromide
Ammonium Bromidum
Ammonium Persulphate
Ammonium Sulphamate
Amygdalas Amara
Anar
Angustura
Aniline
Anilinum
Anthemis Nobilis
Antifebrin
Antimonium Sulphuratum (Aureum)
Antimony Penta Sulphate
Antimony Solution, Standard
Antimony tri-chloride
Antipyrinum
Antrodiaeotus Lasidora
Appendix I

Appendix II
Appendix III
Appendix VB
Apocynum Androsaemifolium
Apomorphine Hydrochloride
Apomorphinum Muriaticum
Aqua Regia
Arctium Lappa
Arctium Majus
Arctostaphylos Uva ursi
Argentum Muriaticum
Aristolochea Serpentaria
Armoracia Alaphathifolia
Armoracia Rusticana
Arsenic (element)
Arsenicum Metallicum
Asclepias Tuberosa
Ascorbic Acid
Atropine
Atropinum

B

Badiaga
Bahama Cascarilla
Balm of Cilead
Balsam Indicum Nigrum
Balsum Peru
Balsum of Copaiba
Bat weed
Benzene
Benzenum
Berberis Aquifolium
Bearberry
Bird Spider
Beta-naphthol
Bismuthum Oxydatum
Bismuth oxide nitrate
Bitter ash
Bitter wort
Blue-Vitriol
Black Peppes
Bladder-wrack
Black Mustard
Black Spider of curacoa
Boric acid
Brassica Alba

Brassica Nigra
Butyric Acid (normal)

C

Cadmium Sulphide
Cadmium Sulphuratum
Caffeine
Caffeine hydrate
Caffeinum
Calcarea Acetica
Calcarea Bromata
Calcarea Caustica
Calcarea Hypophosphorosa
Calcium Acetate
Calcium Bromide
Calcium Chloride Solution
Calcium Hydroxide
Calcium Hypophosphite
Cassia Angustifolia
Cascarilla
Castaner Sativa
Castanea Vesca
Castor fiber
Castoreum
Castor oil plant
Catechol Violet Solution
Chamaelerium Luteum
Chamomile (English)
Chininum Muriaticum
Chionanthus Virginica
Chloral Hydrate
Chondodendron Tomentosum
Cimex Lectularius
Cinnabaris
Citric Acid
Cobaltous Chloride Solution
Cocculus-Chondodendron
Cochlearia Armoracia
Codeine
Comfrey
Codeinum
Contents
Copaiba Officinalis
Copper acetate
Copper Solution Standarad
Copper Sulphate

Cornus Florida
Coumarouna Odorata
Couch
Croton eleuteria
Crystal Violet Solution
Cubeba Officinalis
Cubeba Pepper
Cupric acetate
Cuprum Aceticum
Cuprum Sulphuricum
Cuprous Chloride
Cynoxylon Floricum

D

Dandelion
2, 9, Dimethyl 1, 10 Phenanthroline Solution (alcoholic)
Dimethyl yellow
Diphenylamine
Dipteryx Odorata
Dolichos Pruriens
Dolichos

E

Elecampane
English Chamomille
Eriodictyon Glutinosum
Ethylenediamine hydrochloride
Euonymus Atropurpurea
Euphorbia Resinifera
Euphorbium

F

False Unicorn
Ferrous Sulphate
Ferrum Sulphuricum
Flowering Dogwood
Foreword
Frangula alnus
Fresh Water Song
Fringe tree
Fucus Vesiculosus

G

Gallic acid
Galipes Officinalis
Gamboge
Gambogia
Garcinia Morella
General Notices

Gentiana lutea
Ginseng Quinquefolia
Ginseng
Glycerin
Gold Chloride Solution
Gold Leaf
Granatum
Granati Cortex
Grindelia Robusta
Grindelia Camporum
Guiacol Solution Alcoholic
Gum Euphorbinum
Gum plant

H

Haematoxylon Campechianum
Hahnemann's Acetate of Lime
Harshringar
Helmet Flower
Helonias Dioica
Horse Radish
Humulus Lupulus
Hydrangia Arborescens
Hydrochloric Acid, Dilute
Hydrochloric Acid, 1:1
Hydrochloric Acid, 0.02 N, 0.05 N, 0.1 N, 0.5 N and 1 N
Hydrochloric Acid Arsenic-free
Hydrocyanic Acid
Hydrogen Peroxide Solution
Hydroxylamine Hydrochloride
Hydroxyl Ammonium Chloride
Hydroxyl, Ammonium Chloride Solution, 6 percent

I

Illicium Anisatum
Indian Arrow Wood
Indicators employed in Volumetric Determinations
Introduction
Inula
Inula helenium
Iron Limit Test
Iron Solution Standard
Isatin

J

Jamaica Dogwood

K

Kabab Chini

Kali Chloricum
Kali Mirch
Kali Oxalicum
Kali Permanganicum
Kash
Kali Tartaricum
Kanphul
Kava Kava

L

Lactic Acid
Lappa Major
Lead Acetate Solution
Lead Chloride
Lead Solution Standard
Leptandra
Leptandra Virginica
List of Monographs
Log-Wood
Lupulus

M

Magnesium acetate
Magnesium Sulphate Solution, 0.05M
Magnesium Uranyl Acetate
Magnesium Uranyl Acetate Solution
Maize Amut
Materials and Solutions employed in tests
Mercuric Sulphide
Monographs
Mordant Black
Mucuna Prurita
Mucuna Pruriens
Murex Purpurea
Murex brandaris
Mygale
Mygale Lasidora

N

1-Naphthol Benzein
Naphthol Solution
Nerium Oleander
Night Jasmine
Nitric Acid
Nitric Acid fuming
Nyctanthes arbortristis

O

Oleander

Oxalic Acid
Oxalic Acid, 0.1N
Oxalic Acid Ammoniacal
Oxalic Acid Solution
Oxide of Bismuth

P

Pareira Brava
Petroleum Ether Light
Phenazone
Piper Cubeba
Piper Methysticum
Piper Nigrum
Piscidia
Pleurisy Root
Populus Candicans
Potassium Chlorate
Potassium Iodobismuthate Solution
Potassium Mercuric Iodide Solution
Potassium Mercuric Iodide Alkaline Solution
Potassium Nitrate
Potassium Oxalate
Potassium Permanganate
Potassium Permanganate Acidic
Potassium Permanganate, 0.1N
Potassium Permanganate Solution
Potassium Plumbite Solution
Potassium Tartarate
Preface
Prickly ash
Prunus Amygdalus
Prunus Communis
Prunus Serotina
Punica granatum

Q

Queen Delight
Quinine hydrochloride

R

Red Sulphide of Mercury
Red willow
Rhamnus Frangula
Rhodamine B
Rhodamine B Solution
Ricinus Communis
Rocky Mountains Grape
Roman chemomile

Rose laurd

S

Sacred Anise tree
Salix Purpurea
Sana
Santhoxylum Americanum
Sarsaparilla
Scilla maritima
Scutellaria
Sea Snail
Senna
Seven Barks
Senna Leaf
Silica Gel
Silver Chloride
Silver Nitrate Solution
Silver Nitrate Solution, 20 percent
Sinapis Alba
Sinapis Nigra
Snake root
Sodium acetate
Sodium Acetate Solution, 10 percent w/v
Sodium Bicarbonate Solution, 5 percent w/v
Sodium Bicarbonate Solution, Saturated
Sodium Carbonate Anhydrous
Sodium Chloride Solution, 20 percent
Sodium Citrate
Sodium Cyanide Solution
Sodium Diethyl Dithio Carbamate 0.1% w/v Solution
Sodium Hydroxide Solution, Ammonia-free
Sodium Hydroxide, Nitrogen free
Sodium Nitrate
Sodium Nitrate Solution 1 percent w/v; 10 percent w/v
Sodium Nitroprusside
Sodium Nitroprusside Solution
Sodium Plumbite Solution
Sodium Potassium Tartarate
Sodium Sulphate Anhydrous
Sodium Tartarate
Sodium Thiosulphate Solution
Sodium Tungstate
Solutions employed in Volumetric Analysis
Spongia palustris
Spongilla lacustris
Squilla

Stillingia Sylvetica
Sucrose
Sulphuric Acid 1 percent, 25 percent, 50 percent
Sulphurous Acid
Symphytum Officinale

T

Tannic Acid
Tannic Acid Solution
Taraxacum
Taraxacum Officinale
Tartaric Acid
Taxus Baccata
Theridion
Theridion Curassavicum
Thyroidinum
Thyroid dessicated
Tongo
Tongo Bean
Triticum Repens

U

Urea
Urginea Maritima
Ustilago Maydis
Uva Ursi

V

Velvet leaf
Veronica Verginica
Veronicastrum Virginicum

W

Wild Black Cherry
Wild liquorice
White Mustard Seeds

X

Xanthoxylum Fraxineum

Y

Yerba Santa

Z

Zinc Sulphate
Zinc Sulphate Saturated Solution

HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H.P.I.)

VOLUME – IV

FIRST EDITION

1983



GOVERNMENT OF INDIA
MINISTRY OF HEALTH

F O R E W O R D

The Homoeopathic Pharmacopoeia Committee was reconstituted by Government of India, Ministry of Health and Family Welfare vide their letter No. X. 19018/21/76-Homoeo., dated the 30th November, 1976. After completion of Volume III of Homoeopathic Pharmacopoeia of India, the Committee had finalised 60 monographs for the fourth volume including four monographs on Nosodes.

The Homoeopathic Pharmacopoeia Committee was again reconstituted by Government of India, Ministry of Health and Family Welfare vide their letter no. X. 19018/26/79-Homoeo., dated the 12th November, 1981, the New Committee had finalised 47 monographs for the fourth volume.

As in the earlier volumes the material in this volume consists of the following items besides 107 monographs :

(i) Preface
(ii) Introduction
(iii) General Notices
(iv) Appendices

The fourth volume of Homoeopathic Pharmacopoeia of India is presented to Govt. of India.

DR. V. T. AUGUSTINE
Secretary
Homoeopathic Pharmacopoeia Committee

NEW DELHI
Dated : 7.9.83

DR. DIWAN HARISH CHAND
Chairman
Homoeopathic Pharmacopoeia Committee

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PREFACE

The Government of India constituted in 1962, a Homoeopathic Pharmacopoeia Committee for the purpose of preparing the Homoeopathic Pharmacopoeia of India with the following objects :

(1) to prepare a Pharmacopoeia of Homoeopathic drugs where therapeutics usefulness have been proved on the lines of the American, German and British Homoeopathic Pharmacopoeia;

(2) to lay down principles and standards for the preparation of Homoeopathic drugs;

(3) to lay down test of identity, quality, purity; and

(4) Such other matters as are incidental and necessary for the preparation of Homoeopathic Pharmacopoeia.

The Committee prepared 180 monographs which comprised Volume I of Homoeopathic Pharmacopoeia of India (1971).

This Committee was reconstituted by Government of India, Ministry of Health and Family Welfare vide letter No. F. 1.3/71-HPC dated 22nd December, 1971. The objects of the Committee were enlarged to prepare Homoeopathic Pharmacopoeia Codex. It prepared 105 monographs which comprised Volume III of Homoeopathic Pharmacopoeia of India (1978).

After finalizing Volume III of H.P.I. (1978) the same Committee and the Working Group met four times each, finalised 60 monographs, including four monographs on Nosodes. The members of this Committee as well as the Working Group are as follows :

1.	Honorary Adviser (Homoeo.) Govt. of India, (Dr. Jugal Kishore).	Chairman
2.	Drugs Controller (India)	Member
3.	Director, Central Drugs Laboratory, Calcutta.	Member
4.	Dr. J. N. Kanjilal, M.B., D.M.S. Homoeopathic Physician, Calcutta.	Member
5.	Dr. P. N. Varma, B.Sc., M.Sc. (Tech. Pharma) Officer-in-charge, HPL, Ghaziabad.	Member
6.	Dr. P. Pandey, M.N.M.S. Homoeopathic Physician, Meerut	Member
7.	Dr. P. N. Mehra, D.Sc., F.N.I., F.N.A.Sc., Head of Botany Deptt., Punjab University, Chandigarh	Member
8.	Dr. K. Prahalad, L.C.P.S. (Bombay) D.O. (Mad). Homoeopathic Physician, Bombay.	Member

9.	Dr. H. L. Chitkara, B.A. (Hons.) D.H.S. Homoeopathic Physician, New Delhi.	Member
10.	Dr. R. K. Bhandari, Homoeopathic Manufacturing Pharmacist, Delhi.	Member
11.	Shri G. S. Bhar, B.A., Homoeopathic Manufacturing Pharmacist, Calcutta.	Member
12.	Dr. S. Rangaswamy, M.A. Ph.D., D.Phil, FRIC. Prof. of Organic Chemistry, University of Delhi, Delhi.	Member
13.	Dr. L.N. Mahapatra, M.B.B.S., M.D., D.B. (Lond.) Prof. & Head of Deptt. Of Microbiology, A.I.I.M.S., New Delhi	Member
14.	Asst. Adviser (Homoeo.) Govt. of India, (Dr. V. T. Augustine).	Member

The Committee appointed a Working Group consisting of the following members to scrutinise the initial draft of monographs prepared by the staff for the fourth volume :

Working Group

1.	Dr. P. N. Mehra	Chairman
2.	Office-in-charge Homoeopathic Pharmacopoeia Laboratory, Ghaziabad	Member
3.	Shri G. S. Bhar	Member
4.	Dr. S. Rangaswamy	Member
5.	Assistant Adviser (Homoeo.) Ministry of Health and Family Welfare.	Secretary

Technical Staff

Dr. B. S. Ahuja	Botanist
Dr. S. P. Singh	R. O. (H)
Dr. (Mrs.) Susham Sehgal	Research Asset. (Homoeo.)

The new Homoeopathic Pharmacopoeia Committee was again reconstituted by Govt. of India, Ministry of Health and Family Welfare vide their letter No. X-19018/26/79-Homoeo, dated 12th November, 1981. This Committee and the Working Group each met twice and finalised 47 monographs.

The list of the members of the new Committee is as follows :

1.	Honorary Adviser (Homoeo.) Dr. Diwan Harish Chand M.B.B.S, LRCP (Edin) DTM & H ('L' Pool) M.D. Hom., F.F. Hom. (Lond), D.H.T. (USA).	Chairman
2.	Drugs Controller (India) Dr. S. S. Gothoskar	Member
3.	Director, Central Drugs Laboratory, Calcutta.	Member
4.	Director, Homoeopathic Pharmacopoeia Laboratory, Ghaziabad. (Dr. P. N. Varma)	Member
5.	Deputy Adviser (Homoeo.) Govt. of India. (Dr. V. T. Augustine).	Member
6.	Director, Central Council for Research in Homeopathy New Delhi	Member
7.	Dr. P. N. Varma, D.Sc., F.N.I., F.N.A.Sc. Chandigarh.	Member
8.	Prof. & Head of Deptt. of Chemistry, University of Delhi, Delhi.	Member
9.	Prof. & Head of Deptt. of Microbiology, A.I.I.M.S., New Delhi. (Dr. L. N. Mahapatra).	Member
10.	Shri G. S. Bhar, B.A. Homoeopathic Manufacturing Pharmacist, Calcutta.	Member
11.	Dr. R. K. Bhandari, Homoeopathic Manufacturing Pharmacist, Delhi.	Member
12.	Dr. Joesph Zakarias, Homoeopathic Manufacturing Pharmacist, Mangalore.	Member
13.	Dr. A. U. Ramakrishna, M.B.B.S., M.F. Hom (Lond.) Homoeopathic Physician, Madras.	Member

14. Dr. K. P. Muzumdar, Member
Homoeopathic Physician, Calcutta.

15. Dr. Dilip Kumar Saha, M.B.S., D.F. Hom. (Lond.) Member
Homoeopathic Physician, Calcutta.

16. Assistant Adviser (Homoeo.) Member-Secretary
Govt. of India.

The new Committee appointed a working group consisting of the following members to scrutinise the initial drafts of monographs prepared by the staff for fourth volume.

Working group :-

1. Dr. P. N. Mehra Chairman
2. Director Member
Homoeopathic Pharmacopoeia Laboratory.
3. Shri G. S. Bhar Member
4. Head of Chemistry Department. Member
Ministry of Health & Family Welfare
5. Asset. Adviser (Homoeo.) Member
Ministry of Health & Family Welfare

Technical staff :-

1. Dr. B. S. Ahuja Botanist
2. Dr. S. P. Singh R. O. (H)
3. Dr. G. P. Garg Chemist
4. Mr. A. K. Satsangi R. A. (Chemistry)

The Committee specially commends the work of Homoeopathic Pharmacopoeia Laboratory, Ghaziabad, for assistance in preparation in general and for providing technical data in particular for the monographs. The Government of India, Ministry of Health and Family Welfare takes this opportunity to record its appreciation of work done by the Committee and the staff engaged in this work.

I N T R O D U C T I O N

Three Volumes of Homoeopathic Pharmacopoeia of India have already been published as follows :

Volume I of H.P.I.	Comprising monographs of	180 drugs published in 1971
Volume II of H.P.I.	Comprising monographs of	100 drugs published in 1974
Volume III of H.P.I.	Comprising monographs of	105 drugs published in 1978

The present Volume IV comprises of 107 monographs, including four monographs of Nosodes. Although the general notices and general instructions are mainly contained in Volume I of H.P.I. (1971), some amendments have been made subsequently in Volume II (1974) and Volume III of H.P.I. (1978) which should be deemed to be applicable to the contents of all the volumes published so far pending formal revision of the text in each in the revised edition.

GENERAL NOTICES AND GENERAL INSTRUCTIONS

The general notices, general instructions and the appendices of the first volume as amended in second and third volume are applicable to the material of this fourth volume of Homoeopathic Pharmacopoeia of India as well as to the earlier three volumes.

Preparation of Nosodes

The methodology to be followed for the preparation of Nosodes has been described in Appendix No. XXVI on .

List of Monographs for H.P.I. Volume – IV with Abbreviations

S. No.	Name of the Monograph	Abbreviation
1.	Abroma Radix	Abrom. r.
2.	Achyranthes Aspera	Achy. asp.
3.	Actaea Spicata	Act. spic.
4.	Adrenocorticotrophin	ACTH
5.	Aegle Folia	Aegle f.
6.	Aethipos Mercurialis Mineralis	Aeth. mer.
7.	Ailanthus Glandulosus	Ailan. g.
8.	Alstonia Scholaris	Alst. sc.
9.	Ammonicum Gummi	Amm. gum.
10.	Ammonium Aceticum	Amm. acet.
11.	Ammonium Bromidum (Ammonium Bromatum)	Amm. brom.
12.	Ammonium Iodatum	Amm. iod.
13.	Amoora Rohituka	Amoora. r.
14.	Ampelopsis Quinquefolia	Amp. quin.
15.	Anagallis Arvensis	Anag. ar.
16.	Anthoxantum Odoratum	Anth. odo.
17.	Anthrakokali	Anthko.
18.	Antimonium Iodatum	Ant. iod.
19.	Argentum Cynatum	Arg. cy.
20.	Argentum Iodatum	Arg. iod.
21.	Arsenicum Hydrogenatum	Ars. hyd.
22.	Aristolochia Clematitis	Arist. cl.
23.	Arum Dracontium	Arum. d.
24.	Arum Maculatum	Arum. mac.
25.	Asarum Europaeum	Asar. eur.
26.	Asterias Rubens	Ast. rub.
27.	Atropinum Sulphuricum	Atr. sul.
28.	Baryta Acetica	Bar. acet.
29.	Baryta Iodata	Bar. iod.
30.	Blumea Odorata	Blam. odo.
31.	Cadmium Sulphuricum	Cad. sul.
32.	Caladium Seguinum	Cal. seg.
33.	Calcarea Oxalica	Cal. oxal.
34.	Calcarea Ova Testa	Ova. t.
35.	Cedron	Cedron
36.	Cephalandra Indica	Ceph. ind.
37.	Chelone Glabra	Ch. glab.
38.	Cistus Canadensis	Cist. can.
39.	Clematis Erecta	Clem. er.
40.	Cucurbita Pepo	Cucur. p.
41.	Curare	Curare
42.	Cyclamen Europaeum	Cycl. eur.

S. No.	Name of the Monograph	Abbreviation
43.	Daphne Indica	Daph. ind.
44.	Diphtherinum	Diphth.
45.	Elaterium	Elet.
46.	Erigeron Canadense	Erig. can.
47.	Eryngium Aquaticum	Eryn. aq.
48.	Eupatorium Purpurium	Eup. pur.
49.	Fagopyrum Esculentum	Fago. esc.
50.	Ferrum Arsenicicum	Fer. ars.
51.	Ferrum Iodatum	Fer. iod.
52.	Ferrum Muriaticum	Fer. mur.
53.	Fraxinus Americana	Frax. am.
54.	Gnaphalium Polycephalum	Gnap. p.
55.	Guaiacum (not published in Pharmacopoeia)	Guaiac.
56.	Guarea Trichiloides	Gua. tri.
57.	Iberis Amara	Iber. am.
58.	Indium Metallicum	Ind. met.
59.	Iridium Metallicum	Ir. met.
60.	Jatropha Curcas	Jat. curc.
61.	Jugulans Cinerea	Jug. cin.
62.	Juglans Regia	Jug. reg.
63.	Kali Aceticum	Kali. ace.
64.	Kali Picricum	Kali pic.
65.	Kali Ferrocyanatum	Kali. fer.
66.	Kali Nitricum	Kali. nit.
67.	Kalmia Latifolia	Kalm. lat.
68.	Lac Vaccinum	Lac. vac.
69.	Lac Vaccinum Defloratum (Lac Defloratum)	Lac. def.
70.	Lachnanthes Tinctoria	Lach. tin.
71.	Lathyrus Sativus	Lat. sat.
72.	Laurocerasus	Lauroc.
73.	Lemna Minor	Lemna m.
74.	Lycopus Virginicus	Lycop. v.
75.	Manganum Carbonicum	Mang. carb.
76.	Mercurius Cyanatus	Merc. cy.
77.	Medorrhinum	Medor.
78.	Mercurialis Perennis	Mer. per.
79.	Mercurius Vivus	Merc. viv.
80.	Millefolium	Millef.
81.	Myrtus Communis	Myrt. com.
82.	Naphthalinum	Naphth.
83.	Narceinum	Narc.
84.	Natrum Arsenicum	Nat. ars.
85.	Natrum Nitricum	Nat. nit.
86.	Nitri Spiritus Dulcis	Nit. s. d.

S. No.	Name of the Monograph	Abbreviation
87.	Oleum Animale	Ol. anim.
88.	Paeonia Officinalis	Paeon. of.
89.	Paris Quadrifolia	Paris q.
90.	Petroselinum Sativum	Petr. sat.
91.	Polygonum Punctatum	Poly. pun.
92.	Polyporus Officinalis	Poly. off.
93.	Pothos Foetidus	Poth. foe
94.	Prunus Spinosa	Prunus. s.
95.	Ptelea Trifolia	Ptel. tri.
96.	Ranunculus Bulbosus	Ran. bulb.
97.	Ranunculus Sceleratus	Renun. s.
98.	Sarracenia Purpurea	Sarr. pur.
99.	Sticta Pulmonaria	Sticta p.
100.	Syphillinum	Syphil.
101.	Teucrium Marum Virum	Teuc. m. v.
102.	Tuberculinum	Tuberc.
103.	Tussilago Farfara	Tuss. far.
104.	Urtica Urens	Urt. u.
105.	Vinca Minor	Vinc. min.
106.	Viola Odorata	Viola od.
107.	Viola Tricolor	Viola t.

ABROMA RADIX

(Abrom. r.)

Botanical name : *Abroma augusta* Linn. **Family**: Sterculiaceae

Common names : *Hindi*: Olatkamal; *English*: Perennial Indian hemp; *French* and *German*: Abrome.

Description : Large shrub or a small tree with downing branches; leaves 8 to 15 cm long, narrowed to 3 to 7 nerved base, repand denticulate, glabrous above, tomentose below; stipulate, linear, deciduous as long as petiole. Peduncles 4 cm, auxiliary flowers, 5 cm across; calyx-lobes lanceolate, free nearly to the base; petals slightly exceeding the sepals, imbricate in bud, deciduous. Capsule 4 to 5 cm in diameter, thrice as long as the persistant calyx, glabrous or nearly so when ripe.

Part used : Root.

Macroscopical : Dried root 0.5 to l mm thick. The outer surface of bark varies with age and girth of the root. It is dull brown and longitudinally wrinkled with small warty markings. Inner surface is whitish-yellow and finally longitudinally striate. The root when soaked in water becomes slimy and slimy mucilage can be completely extracted in cold water after keeping the bark for 3 to 4 days. The bark apparently looks fibrous. Tasteless but slimy; odourless and tough but not brittle.

Microscopical : The root bark consists of periderm and secondary phloem. The cork forms external bounding layer followed inward by the cork cambium. Just below the cork cambium lies the secondary cortex which is characterised by the presence of secretory cells, clusters of calcium oxalate crystals and starch grains. Just beneath the secondary cortex is the secondary phloem. It is characterised by the stratification of hard bast and soft bast. Phloem rays broader outwards and narrower inwards. Fibres cells 3 to 4 mm long and 14 to 16 μ in diameter, tapering at both ends. The secondary mucilage cavities are met with in 2 rows. Starch grains present, both in phelloderm and in the phloem rays, simple, globular, varying from 5.5 to 30 μ in diameter.

Distribution : It occurs wild or cultivated throughout India from Uttar Pradesh to Sikkim, Khasia Hills, Asam, Bengal and Bihar.

History and authority : Introduced by S. C. Ghose, *Drugs of Hindoosthan,* 23.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Abroma Augusta Radix, moist magma containing solids 100 g and plant moisture 300 ml	400 g

Purified Water	400 ml
Strong Alcohol	335 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, three parts of *Strong Alcohol* and six parts of Purified Water; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

ACHYRANTHES ASPERA

(Achy. asp.)

Botanical name : *Achyranthes aspera* Linn. **Family**: Amaranthaceae

Common names : *Hindi*: Latjira; *English*: Prickly Chaff-flower; *French*: Cedelari.

Description : A herb, upto 1 m in height; leaf opposite, 2.5 to 12.5 cm, extremely variable, generally thick, pubescent-tomentose-velvety, rarely glabrate, petiole short. Spikes usually with a robust rachis that rapidly lengthens, sometimes upto 30 cm long. Flower 4 to 8 mm longer than the bracteoles, sepals subequal; stamens 5, staminodes fimbriate; ovary oblong, sub-compressed, style filiform, stigma capitellate, ovule-1, pendulous from a long basal funicle. Fruit utricle, oblong or ovoid, indehiscent, top areolate or rounded. Seed brown, oblong, testa coriaceous; embryo annular.

Part used : Whole plant excluding roots.

Microscopical : Stem: angular, showing a single layer of epidermis with thin cuticle; uniseriate multicellular hairs; collenchyma in the ribs and chlorenchyma in grooves; 5 to 8 layered cortex; pericycle of isolated patches of sclerenchyma fibres lying opposite a rib; conjoint, collateral and endarch bundles in a ring towards periphery and two medullary vascular bundles in the central region; phloem of sieve tubes and companion cells and also present inter-xylary phloem; cambium confined to vascular bundles forming a continuous ring which behaves normally and also an accessary cambium in pericyclic region producing lignified conjunctive tissue and conjoint, collateral and endarch bundles towards inner side and a few cells on the outer side; medullary rays absent; xylem of vessels with scalariform pits, tracheids and xylem parenchyma; crystals of calcium oxalate in cortex and pith.

Leaf: single layered upper and lower epidermis covered by cuticle; uniseriate, multicellular trichomes and anomocytic stomata on both the epidermis. Mesophyll differentiated into palisade and spongy parenchyma, palisade not extending in the midrib region and with palisade ratio from 8 to 9.5, conjoint, collateral vascular bundles surrounded by parenchymatous sheath, xylem towards upper epidermis and phloem towards lower epidermis; crystals of calcium oxalate.

Distribution : Throughout India.

History and authority : Introduced by Ghose: *Drugs of Hindoosthan*, 51.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Achyranthes Aspera, moist magma containing solid 100 g and plant moisture 200 ml	300 g
Strong Alcohol	820 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, two parts of Purified Water *and* seven parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ACTAEA SPICATA

(Act. spic.)

Botanical name : *Actaea spicata* Linn. **Family**: Ranunculaceae

Synonym : *Actaea racemosa* Gilib.

Common names : *English*: Black Snake-root; *French*: Raisin de' Loup Christophe; *German*: Christophswurz.

Description : Deciduous, perennial, dark green, glabrous herb with black creeping root-stock sending up each year erect stems, growing up to 1 m in height, which are triangular and either not branched or very sparingly so. The foot-stalks of the leaves are long and arise from the abbreviated root stock. These divide into 3 smaller stalks and are so divided or re-divided that each leaf is composed of 18 or even 27 lobes or leaflets. Flower stem arises from the root stock and has leaves of the same form but smaller. Flowers in spikes, of pure white colour. Fruits egg-shaped berries, 1.2 cm long, black shining, many seeded and very poisonous.

Part used : Roots.

Macroscopical : Perennial root forms a strong racemose-fibrous stalk, dark brown in colour and when dried, of black colour; the long ramifying rootlets show in section a stellate quadripartite medullary substance; taste acrid and poisonous.

Distribution : Found all over Germany, temperate Europe, temperate and Arctic Asia.

History and authority : Introduced in 1852 by Petroz, *Journ. dl. Soc. Gal.* III, 12; Allen: *Encyclop. Materia Medica*, Vol. I, 45.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Actaea Spicate in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

ADRENOCORTICOTROPHIN
(ACTH)

Common names : Corticorophin, Adrenocorticortrophic hormone.

Description : White or almost white hygroscopic flakes or powder.

It contains not less than 55 units per mg and not more than 5 units of pressor activity per 100 units of corticotrophin activity.

Adrenocorticotrophin is obtained from the anterior lobe of the pituitary gland of the pig and contains hormone that increases the rate at which corticoid hormones are secreted by the adrenal gland. It is a protein consisting essentially of a single chain of amino acids. Approximate molecular weight is 3,500.

It may be prepared by extracting acetone dried powder of the anterior lobes of the pituitary gland with 16 volumes of *glacial acetic acid* at 70°, filtering, precipitating impurities from the filtrate by the addition of 8 volumes of *acetone* and precipitating the active materials by the addition of an equal volume of solvent *ether*, the precipitate being washed free from acetic acid with *acetone*. The precipitate is purified by absorption or *oxycellulose* or *carboxymethyl cellulose* or by another suitable method. If other methods of preparation are used they should not involve any obvious hydrolysis or degradation of the active material. The purified material may be sterilised by a process of filtration and is dried by a suitable method.

Solubility : Very soluble in *water*.

Identification : 1. Precipitates in 2.5 percent *trichloroacetic acid solution.*

2. Precipitates from dilute solution by 20 percent *sulphosalicylic acid* and by 5 percent *lead acetate solution.*

Clarity of solution : A 1.0 percent w/v solution in *water* is clear and not more than slightly opalescent and has a pH of 3 to 5.

Pressor activity : Determine the pressor activity by the biological assay of posterior pituitary injection. It contains not more than 5 units of pressor activity per 100 units of corticotrophin activity.

Abnormal toxicity : A quantity equivalent to 5 units dissolved in, not more than 0.5 ml of saline solution and injected intravenously into each of 5 normal mice, weighing between 18 and 22 g each and the injection occupying not more than 60 seconds, does not cause the death of any one of them within forty-eight hours. If one of the five mice dies, the test is repeated with a second group of five mice and the

sample complies with the test if none of them die within forty-eight hours.

Loss on drying : Loses not more than 7.0 percent of its weight when dried to constant weight at 60° at a pressure not exceeding 5 ml of *mercury*.

History and authority : Proved and introduced by W. L. Templeton, *Brit. Homoeo. Jour.* 44, 89-97, 1954 and 45, 88, 1956.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Adrenocorticotrophin	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and 3x in Purified Water; 4x and higher with *Dispensing Alcohol*.

(c) Trituration 1x — Drug strength 1/10

Adrenocorticotrophin	100 g
Saccharum Lactis	900g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I; 6x may be converted into liquid 8x, H.P.I., Vol. I

Storage : All potencies below 6x should be kept in a well closed container, protected from light and stored at a temperature not exceeding 25°. Under these conditions it may be expected to retain their potency for about two years.

Revised Monograph Appeared in HPI Vol. X

AEGLE FOLIA
(Aegle f.)

Botanical name : *Aegle marmelos* (Linn.) Correa ex Roxb. **Family**: Rutaceae

Common names : *Hindi*: Bel; *English*: Bael

Description : A small or medium sized, deciduous tree, armed with straight sharp axillary throns which are 2.5 cm long. Leaves alternate, three-foliate but sometimes five-foliate, leaflets ovate-lanceolate, entire or crenate. Flowers in short lateral panicles, greenish-white, sweet scented, about about 2.5 cm across; petals 4 or 5, imbricate; stamens 30 to 60, filaments short. Fruits 7.5 to 20 cm in diameter, usually globose, smooth, grey, yellow or greenish, rind woody, pulp sweet and aromatic.

Part used : Leaf.

Macroscopical : Leaves, pale green, glabrous, alternate, odd pinnate of 3 to 5 leaflets, lateral leaflets opposite and nearly sessile, terminal long petioled, ovate-lanceolate, 7 to 13 cm long, entire or crenate, acute, reticulate covered with glands. Petiole not winged.

Microscopical : The diagnostic characteristics are: single layered epidermis covered with cuticle, stomata anomocytic on both surface, mesophyll differentiated into palisade and spongy parenchyma, containing chloroplast, palisade continuous in the mid-rib region; scleranchyma cells surrounding the central stele.

Distribution : The plant grows wild in sub-Himalayan tract ascending to 1200 m and also in the Western Himalayas; Central and South India. It is often planted in gardens all over India.

History and authority : Introduced by S. C. Ghose, *Drugs of Hindoosthan*, 87.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Aegle Folia, moist magma containing solid 100 g and plant moisture 160 ml	260 g
Purified Water	100 ml
Strong Alcohol	750 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

AETHIPOS MERCURIALIS MINERALIS

(Aeth. mer.)

Chemical formula : HgS **Mol. wt.**: 232.68

Common names : *English*: Mercuric sulphide Black; *German*: Queck Silbarmchri.

Description : Black or greyish-black, heavy, odourless, tasteless amorphous powder. Also occurs as black cubic crystals, transition temperature (red to black 386º). Black form can exist indefinitely in metastable state at room temperature. It is prepared in laboratory by passing H_2S gas through acidic solutions of mercury salt. It dissolves in concentrated *nitric acid* and *aqua regia.* Insoluble in *water*, *alcohol*, *yellow ammonium sulphide* and dilute mineral acids.

Identification : Its solution in hot concentrated *nitric acid* yields reactions characteristics of mercury salts, H.P.I., Vol. I

Chloride and sulphate : 1 g of drug complies with the test given in, H.P.I., Vol. I

Assay : Weigh accurately about 1.2 g and boil gently under reflux condenser for 5 minutes with 10 ml of concentrated *nitric acid* and 25 ml of *water*, cool, wash the condenser with 25 ml of *water* and add sufficient solution of *potassium permangnate* to produce a permanent pink colour, add a trace of *ferrous sulphate* to discharge the pink colour and titrate with 0.1 N *ammonium thiocynate solution*. Each ml of 0.1 N *ammonium thiocynate* is equivalent to 0.011634 g of HgS.

History and authority : Boericke: *Mat. Med. with Reportory*, 9th Ed. 17.

Preparation : (a) Trituration 1x Drug strength1/10

Aethiops Mercurialis Mineralis	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I,

AILANTHUS GLANDULOSUS
(Ailan. g.)

Botanical name : *Ailanthus glandulosus* Desf. **Family**: Simaroubacea

Synonym : *A. altissima* (Mill.) Swingle

Common names : *English*: Chinese sumach; *German*: Gotterbaum.

Description : A leafy, deciduous tree, having abundant root-suckers. Leaves up to 90 cm long, pubescent or nearly glabrous; leaflets numerous, divided unequally by the mid vein finely ciliate, glabrous, paler-beneath, very coarsely toothed at base, usually with 1 to 3 pairs of glandular teeth near the base. Flowers small, in branched terminal panicles, staminate pistillate or polygamous with a peculiar disagreeable odour; petals wooly-tomentose inside; filaments filiform, exerted, several times exceeding the anther, hispid at base. Fruit samara, twisted at the top, 2.5 to 5 cm in diameter; seeds near the center of the samara about 6 mm by 2.5 mm.

Part used : Stem bark of young shoots and well developed flowers.

Microscopical : Stem-bark in transection composed of wide-phellum; an ill-defined 1 to 2 layered phelloderm; a large secondary cortex containing oval, isodiametric parenchyma cells, groups or bands of brachysclereids; thick-walled narrow lumened fibres and crystal fibres; abundant, rhomboid, octa-rectangular crystals; micro crystals of calcium oxalate. Powder showing thick-walled cork cells, 16 to 40 µ by 10 to 24 µ; oval rectangular elongated parenchyma cells 40 to 400 µ by 16 to 55 µ; abundant brachysclereids, 30 to 74 µ by 14 to 44 µ; sclerenchyma fibres usually with tapering ends 330 to 660 µ by 1.0 to 16.5 µ; patches of ray cells 20 to 32 µ in diameter; rhomboid, octa-rectangular crystals 12 to 24 µ; few aggregate of calcium oxalate crystals.

Identification : Evaporate 20 ml of 70 percent alcoholic extract of drug to remove alcohol, then extract it with 20 ml *chloroform* and separate the two layers.

(a) Carryout TLC of *chloroform* extracts on silica gel 'G' plate using *benzene* : *methanol* (95 : 5 v/v) as mobile phase and *antimony trichloride* solution as spray reagent. Six spots appear at R_f 0.20 (dark blue), 0.25 (greenish-blue), 0.29 (greenish-blue), 0.32 (pink), 0.40 (pink) and 0.73 (blue).

(b) Carryout TLC of *chloroform* extracts on silica gel 'G' plate using *benzene* : *methanol* (95 : 5 v/v) as mobile phase and *alcoholic aluminium chloride* as spray reagent. Three spots appear at R_f 0.20, 0.29, 0.32 (Under UV light four sports appear at R_f 0.16, 0.20, 0.23, 0.32 (all having blue flourescence.)

(c) Carryout TLC of *chloroform* extract on silica gel 'G' plate using *n-butanol* : *acetic acids* : *water* (4 : 1 : 1 v/v) as mobile phase and *alcoholic aluminium chloride* as spray reagent. Five spots appear under UV light at R_f 0.57, 0.73, 0.77, 0.82 and 0.90.

Distribution : Northern India, cultivated.

History and authority : First proved and introduced by Hering and Lippe in 1840-50; Allen: *Encyclopedia Mat. Med.*, Vol. I 133; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I 49.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ailanthus Glandulosus, moist magma containing solids 100 g and plant moisture 300 ml	400 g
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x to contain one part Mother Tincture two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

ALSTONIA SCHOLARIS
(Alst. sc.)

Botanical name : *Alstonia scholaris* R. Br. **Family**: Apocynaceae

Common names : *Hindi*: Satwan; *English*: Dita Bark; *French*: Ecorce de dite; *German*: Ditarinde.

Description : A tall evergreen tree, with a straight, often fluted and buttressed, 12 m high and upto 3 m in girth. Leaves 3 to 7 in a whorl, glabrous, coriaceous, oblong-lanceolate or obovate, shining above, pale beneath, 10 to 20 cm long, nerves 30 to 60 pairs joining into an intra-marginal one, base acute, tip obtuse or obtusely acuminate, narrowed into a petiole about 6 to 13 mm long. Inflorescence peduncled or sessile cyme, umbellately branched or capitate, peduncles whorled, 2.5 to 5 cm long; calyx small, about 3 mm long, pubescent; corolla white, pubescent, throat villous, lobes rounded. Fruit of two long slender follicles, 30 to 60 cm long by 3 mm in diameter, hanging in clusters. Seeds 6 mm long, flattened, ciliate.

Part used : Bark.

Macroscopical : The bark occurs in channelled or occasionally quilled pieces, up to about 3 or 4 mm thick from the branches and out of broken, irregularly curved or flat pieces, up to 7 mm thick, from the stem. Externally, the younger bark is dark-grey to brownish and the older bark is very rough, uneven and much fissured, both transversely and longitudinally, both are marked by numerous rounded or transversely elongated, grey to whitish-brown lenticels. Internally, it is brownish-buff to dark greyish-brown, somewhat striated and indented. The fracture is short and smooth transverse surface shows a narrow inner portion traversed by numerous fine medullary rays and a spongy outer portion of varying extent. Odourless; taste persistently bitter.

Microscopical : The bark is characterised by the presence of a multi-layered thick and thin walled cork, broad zone of secondary cortex, containing numerous rhombic or polygonal crystals of calcium oxalate and numerous stone cells and secondary phloem containing sieve tubes; cork cells brick-shaped to almost square in form is transverse and longitudinal sections and are polygonal in surface view. Cork cambium forms region of two rows of cells of identical form and is situated between cork and secondary cortex. The secondary cortex is composed of thin-walled parenchymatous cells and includes many rounded latex cavities scattered through the tissue. Stone cells form a non-continuous layer of 4 to 8 cells deep towards the outer portion of cortex and are also seen scattered throughout secondary cortex singly or in groups of 3 to 10 or more. Stone cells are of

various shapes, viz., rounded to linear fibre-like blunt at both ends; thickening of the walls also varies as also the girth of the lumen. The secondary phloem cells consist of phloem parenchyma, sieve tubes and companion cells. The bark is conspicuous in not having any fibres, whether cortical or phloem.

Distribution : Throughout humid regions of India, especially in the West Coast forests.

History and authority : Introduced in 1866, *Monthly Homoeopathic Review*, Vol. X, 508; Allen: *Encyclopedia Materia Medica*, Vol. I, 192.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Alstonia Scholaris in *coarse powder*	100 g
Purified water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water and seven parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VII

AMMONIACUM GUMMI
(Amm. Gum.)

Common name : *English*: Gum ammoniac.

Description : A gum-resin is obtained from the flowering and fruiting stem of *Dorema ammoniacum* D. Don. and other allied species of family Umbelliferae (Apiaceae). Irregular rounded tears, yellowish or brownish outside and whitish within, brittle when cold, but soft when warm; also masses, darker in colour and less homogenous; odour peculiar; slightly sweetish bitter, somewhat acrid taste. Partly soluble in *water*, *alcohol*, *ether*, dilute *acetic acid* or alkali solution; forms emulsion with *water*.

Identification : (a) Extract 5 g of drug with 25 ml *chloroform*, 25 ml *ethanol* and 25 ml *water*. Carry our T.L.C. of chloroform extract on silica gel 'G' plate having mobile phase *benzene* : *methanol* (95 : 5); gives 5 spots in U.V. light having R_f value 0.08, 0.14, 0.34, 0.67, 0.79 and after spraying with *antimony trichloride* gives seven spots having R_f value 0.14, 0.34, 0.54, 0.67, 0.73, 0.79 and 0.97.

(b) The T.L.C. of alcoholic extract (after chloroform extract) on silica gel 'G' plate using solvent system, *methanol*: *acetic acid*: *ether*: *benzene* (1 : 18 : 60 : 120), gives two spots in U.V. light, having R_f value 0.69 and 0.83 and after spraying with *potassium ferricyanide*; *ferric chloride solution* gives three spots, have R_f value 0.81, 0.83 and 0.95, R_f value 0.81 corresponds to reference sample *salicylic acid*.

(c) T.L.C. of hydrolysed aqueous extract on silica gel 'G' plate (*sodium acetate* coated plate) using *solvent n-butanol* : *acetone* : *water* (4:5:1), gives four spots after spraying with *anilinephthalate* as spray reagent and heating having, R_f value 0.09, 0.56, 0.61, 0.71. R_f 0.56 corresponds to reference sample glucose and R_f 0.71 corresponds to rhamnose.

History and authority : Proved by Buchner, *Hygea* XIII, 212; Allen: *Encyclop. Mat. Med.*, Vol. I, 249.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammoniacum Gummi	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I

AMMONIUM ACETICUM
(Amm. acet.)

Chemical formula : CH_3 COO NH_4 **Mol. wt.**: 77.08

Common name : *English*: Ammonium acetate.

Description : Colourless, hygroscopic, crystals or crystalline masses; odour slightly acetous; very deliquescent. Tends to lose ammonia. Ammonium aceticum is the ammonium salt of acetic acid. Very soluble in *water* and in *alcohol*, slightly soluble in *acetone.* It contains not less than 97.0 percent of $C_2H_7NO_2$ calculated with reference to the substance dried at 105º to constant weight.

Identification : Yields the reactions characteristic of *ammonium salts,* H.P.I., Vol. I, and of *acetates,* H.P.I., Vol. I,

Residue of ignition : Leaves on gently ignition, not more than 0.01 percent w/w, H.P.I., Vol. I,

Chloride : Dissolve 2 g in 50 ml of *water* and add 1 ml of dilute *nitric acid* and 1 ml of *silver nitrate solution*. No opalescene is produced.

Sulphate : Dissolve 4 g in 10 ml of *water* and add about 20 mg of *sodium bicrabonate*. Evaporate to dryness on a water bath and heat at 120º until the *ammonia* is volatalised. The residue complies with the *limit test* for *sulphates*, H.P.I., Vol. I,

Acidity : 5 percent of solution in *carbon dioxide-free water,* is not more acid than pH 6.5 using *bromothymol blue solution* as an indicator.

Lead : Not more than 5 parts per million, H.P.I., Vol. I,

Iron : Not more than 5 parts per million, H.P.I., Vol. I,

Assay : Dissolve about 3 g accurately weighed, in 50 ml of *water*. Add 50 ml of 1 N *sodium hydroxide solution*. Boil gently for 10 to 15 minutes to expel all the ammonia. Cool and add *water* in quantity sufficient to make-up the volume to 100 ml. Titrate the excess of alkali with 1 N *sulphuric acid* using *thymol blue solution* as an indicator. Each ml of *sodium hydroxide* is equivalent to 0.07708 g of $C_2H_7NO_2$.

History and authority : Clarke: *A Dictionary of Practical Materia Medica,* Vol. I, 81.

Preparation : Mother Solution ϕ — Drug strength 1/10

Ammonium Acetate	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

Caution : Preparation below 3x to be freshly prepared.

Original Monograph Appeared in HPI Vol. III

AMMONIUM BROMIDUM (AMMONIUM BROMATUM)

(Amm. brom.)

Chemical formula : NH_4Br **Mol. wt.**: 97.95

Common names : *English*: Ammonium bromide; *French*: Bromure d' ammonium; *German*: Bromammonium.

Description : A white crystalline powder; odourless; taste pungent and saline; slightly hygroscopic. Slowly becomes yellowish in air. Sublimes at high temperature without melting. Contains not less than 99.5 percent of NH_4Br calculated with reference to the substance dried constant weight at 105°. Freely soluble in *water*, in *alcohol;* in *acetone*; slightly soluble in *ether*; practically insoluble in *ethyl acetate.*

Identification : Yields the reactions characteristic of *ammonium* salts, H.P.I., Vol. I, of *bromides*, H.P.I., Vol. III

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I

Chloride : 1.5 g complies with the *limit test* for *chlorides,* H.P.I., Vol. I

Sulphate : 10 g complies with the *limit test* for *sulphates,* H.P.I., Vol. I

Bromate : Dissolve 0.5 g in 10 ml of *carbon dioxide-free water;* add 2 drops of 10 percent *potassium iodide solution*, 1 ml of *starch* solution and 5 drops of 1 N *sulphuric acid* and allow to stand for one minute. No blue or violet colour is produced.

Heavy metals : Not more than 2 parts per million, H.P.I., Vol. I

Loss on drying : Loses not more than 0.1 percent of its weight when dried to constant weight at 105°.

Assay : Dissolve about 1.0 g, accurately weighed, in *water* and dilute to 100 ml with *water*. To 10 ml of the solution add 100 ml of *water*, 10 ml *sulphuric acid* and a few glass beads. Heat to boiling and while the solution still boiling, titrate with 0.1 N *potassium permanganate solution* added drop wise until the pink colour just persists. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.009795 g of NH_4Br.

History and authority : Proved and introduced by Cashing, *Trans. A. I. H.,* 1870; Allen: *Encyclop. Mat. Med*., Vol. I, 256; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 82; Hering: *Guiding Symptoms,* Vol. I, 225.

Preparation : (a) Trituration 1x Drug strength 1/10

Ammonium Bromidum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x should be stored in well-closed containers.

AMMONIUM IODATUM
(Amm. iod.)

Chemical forumula : NH_4I **Mol. wt.**: 144.96

Description : White or slightly yellow, hygroscopic crystals or in granules; odourless; taste sharp saline. Becomes yellow to brown on exposure to air and light due to liberation of *iodine.* Decomposes on heating. Very soluble in *water*; soluble in *alcohol;* in *glycerin* and in *methanol.* Contains not less than 98.0 percent of NH_4I calculated with reference to the substance dried at 100° to a constant weight.

Identification : Yields the reactions characteristic of *ammonium* salts; H.P.I., Vol. I, and *iodides,* H.P.I., Vol. I,

Loss on drying : Not more than 5 percent.

Acidity : pH of 1.5 percent solution is 4.6.

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I,

Residue on ignition : Leaves not more than 0.05 percent of residue when ignited gently to a constant weight, H.P.I., Vol. I,

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I,

Sulphate : 2 g complies with the *limit test* for *sulphate,* H.P.I., Vol. I,.

Heavy Metals : Not more than 10 parts per million, H.P.I., Vol. I,.

Barium : Dissolve 2 g in 10 ml of *water;* add 3 drops of *glacial acetic acid* and filter, if necessary. Add to the filtrate 3 ml of a clear 10 percent w/v *sodium sulphate solution*. Shake well and allow to stand for 10 minutes. No turbidity is produced.

Chloride : 4 g complies with the *limit test* for *chlorides,* H.P.I., Vol. I,

Assay : Weigh accurately about 0.4 g and dissolve in 20 ml of *water* in a glass stoppered flask. Add 30 ml of *hydrochloric acid* and 5 ml of *chloroform,* cool, if necessary and titrate with 0.05 M *potassium iodate* until the *iodine* colour disappears from the aqueous layer. Shake vigorously for 30 seconds and continue the tirtration shaking vigorously after each addition of the *potassium iodate,* until the *iodine* colour in the *chloroform* is discharged. Each ml of 0.05 M *potassium iodate* is equivalent to 0.01450 g of NH_4I.

History and authority : Introduced by Sidney Ringer, *M. .B. Practitioner*, Vol. VIII, 1872, 129; Allen: *Encyclop. Mat. Med.,* Vol. X, 289.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium Iodatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I,; 6x may be converted to liquid 8x, H.P.I., Vol. I,

AMOORA ROHITUKA

(Amoora. r.)

Botanical name : *Amoora rohituka* W. & A. **Family**: Meliaceae

Common name : *Hindi*: Rohituka.

Description : An evergreen tree, with large crown of branches. Leaves up to 1 m long; leaflets 9 to 15, 7.5 to 23.0 by 3.3 to 10.0 cm; young parts tawny closely pubescent, early glabrescent. Flowers white, bracteate, sub-sessile; male spikes panicled, female simple, calyx 5 partite, petals 3, anthers 6, ovary 3-celled with two superposed ovules in each cell.

Part used : Bark.

Macroscopical : The drug occurs in pieces varying from 5 to 16 cm in length, 2 to 6 cm in breadth and 5 to 15 mm in thickness, flat or slightly curved. External surface spotted with brownish or whitish-brown cork, which is smooth and finely wrinkled, separated by rough dark to buff-coloured areas with cracks, where cork had mostly peeled off. Internal surface of the bark yellowish-brown in colour, finely striated longitudinally and smooth. Outer bark peels off in stratified flakes showing a buff-coloured interior. Transverse surface after smoothening shows brownish-white cork, below which the rays are longer, at other places the bark is soft, wide wedge-shaped mass with short rays. Fracture short and granular in the outer region and fibrous in the inner region. Taste and odour is not distinct.

Microscopical : The diagnostic characters are: the collapsed outer cork cells filled with brown colouring matter; distinct thin-walled inner cork cells, tangentially elongated, radially arranged 20 to 52 µ by 10 to 20 µ in the outer layers, but from 33 to 110 µ by 10 to 50 µ in inner layers, at places phelloderm forming wedge-shaped whitish tissue, the cells of which are mostly rounded or slightly tangentially elongated, measuring 40 to 75 µ by 18 to 75 µ by 18 to 75 µ thick-walled lignified pitted stone cells present singly or in groups, mostly oval to circular, rectangular or tangentially elongated measuring 30 to 132 µ, by 26 to 70 µ; rhytidoma enclosing a part of dead parenchymatous phelloderm and few stone cells; secondary phloem of sieve tubes, companion cells, phloem parenchyma, phloem fibres and crystal fibres; short phloem rays 8 to 12 per mm, radially elongated 3 to 21 cells in height; tannin and rosette or prisms of calcium oxalate in the parenchyma of phelloderm and phloem; starch grains simple round to slightly oval with hilum, 4 to 20 µ in diameter.

Distribution : Eastern Himalayas and Western Ghats.

History and authority : Introduced and proved by Ghose: *Drugs of Hindoosthan*, 7th Ed., 60.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Amoora Rohituka, in moderately *coarse powder*	100 g
Purified Alcohol	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

AMPELOPSIS QUINQUEFOLIA

(Amp. quin.)

Botanical name : *Parthenocissus quinquefolia* Planch **Family**: Vitaceae

Synonyms : *Ampelopsis quinquefolia* Michx, *A. hederacea* DC., *A. virginiana* Hert.

Common names : *English*: American Ivy; *French*: Vigne Vierge; *German*: Wilder Wense.

Description : A large climber; tendrils with 5 to 8 branches ending in adhesive tips; young shoots purplish; leaflets elliptical to obovate-oblong, acuminate, usually cuneate at the base, coarsely and often crenately serrate, dull green above, glaucescent beneath; cymes crowded into terminal panicles. Fruit bluish-black slightly, bloom, about 6 mm thick with usually 2 or 3 seeds.

Part used : Bark and young twig.

Microscopical : Young stem, exhibits cork arising immediately below the epidermis, successive annual growth zones produced from the same phellogen but remaining separated from one another by a layer of sclerotic cork; acicular crystals in cortex and phloem cells.

Distribution : U.S.A., from New England to Florida and Mexico, West to Ohio and Illinois.

History and authority : Introduced by Dr. Hale, *New Remedies*, 2nd Ed.; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 96.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ampelopsis Quinquefolia in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

ANAGALLIS ARVENSIS

(Anag. ar.)

Botanical name : *Anagallis arvensis* Linn. **Family**: Primulaceae.

Common names : *Hindi*: Jonkamari; *English*: Scarlet pimpernel; *French*: Mouron rouge; *German*: Gauchheil.

Description : A trailing annual herb, with stem 15 to 50 cm long, more or less procumbent, quadrangular, glabrous and branching. Leaf opposite, entire, ovate, sessile, dotted on the lower surface. Flowers appear singly from axil of the leaves; peduncle erect during flowering but curved backward when the seed is ripening; pentamerous; petals scarlet on the upper surface; stamens five on which are present a number of delicate, violet hairs. Fruit a tiny capsule (urn-like) splitting into 2 halves, the upper half lifts up like a lid; seeds dispersed by wind. Odourless; taste bitter and rather astringent.

Part used : Whole plant (scarlet variety and when the leaves are at their best).

Microscopical : Leaf: dorsiventral, epidermal cells having sinuous anticlinal walls; stomata anomocytic; glandular hairs with unicellular heads. Mesophyll differentiated into palisade and spongy parenchyma. Secretory cells with reddish-brown contents, appearing as dots.

Stem: quadrangular and winged, vascular bundles widely spaced arranged around the pith portion, one bundle opposite each of the four angles of the stem; the tissue connecting the two vascular bundles sclerenchymatous, endodermis well-defined; pericyclic sclerenchyma as reported in the other genera of the family absend; xylem vessels with simple pits; secretory cells present in the unlignified tissue.

Distribution : Throughout India; native of Europe, Asia and Africa.

History and authority : Proved and introduced by Schreter and Gunther; Allen: *Encyclop. Mat. Med*., Vol. I, 329; Hering: *Guiding Symptoms*, Vol. I, 302.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Anagallis Arvensis, moist magma containing solid 100 g, plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VIII

ANTHOXANTHUM ODORATUM

(Anth. Odo.)

Botanical name : *Anthoxanthum odoratum* Linn. **Family**: Graminae (Poaceae)

Common name : English: Sweet vernal grass.

Description : A perennial, deciduous herb, 30 to 70 cm high. Leaves mostly near the base, 2 to 5 mm wide, the upper much shorter; spikelets brownish-green, three-flowered. Lateral flowers neutral consisting of one palea, hairy on the outside and awned on the back. One of the neutral flowers bears a bent awn from near the base, the other is short-awned below the tip. Central terminal flower is perfect. Glumes are very thin, acute, keeled, the upper about as long as the flower and twice the length of the flower. Anthers yellow.

Part Used : Whole plant.

Microscopical : Leaf: adaxial epidermis with short-cells over the veins, mostly solitary or occasionally in pairs in frequent over or absent between veins; silica cells over the veins, horizontally elongated with smooth or sinous outlines; macro-hairs fairly long with swollen base, prickly at leaf margins; stomata with parallel sided subsidiary cells. Adaxial surface with slight ribs and furrows; hairs frequent over the veins; mesophyll collenchymatous not radiate; bulliform cells towards the leaf margins in small or angular prickles or fan-shaped groups. Bundle-sheaths mostly double around the vascular bundles, in some bundles with slight adaxial interruption to the outer seed, while in a few others especially in the keel the outer sheath with adaxial extension.

Culm: with a large central cavity, epidermis subtended by about 3 layers of cells with strongly thickened wall, having a few small columns of thin-walled a assimilatory tissue embedded amongst them. Ground tissue on the inner side of mechanical ring consisting of about 4 layers of cells. Vascular bundles in two circles some of the smaller ones in the outer circle being embedded in the peripheral mechanical tissue.

Root: surface with a piliferous layer bounding a thin-walled, 5 to 6 celled-wide cortex, endodermis well developed, with marked thickening of the inner tangential and radial walls; stele polyarch, consisting mainly of thick-walled ground tissue phloem being much reduced. Xylem consists of 2 to 3 large vessels near the centre of the root or up to 8 or 9 such vessel throughout of the stele. Centre of the stele consisting of fibrous elements.

Distribution : Throughout U.S.A.; cultivated in India.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 118; Boericke: *Mat. Med. and Repertory*, 9th Ed., 89.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Anthoxanthum Odoratum, moist magma containing plant moisture 150 ml and solid 100 g	250 g
Purified Water	100 ml
Strong Alcohol	777 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

ANTHRAKOKALI
(Anthko.)

Common name : *English*: Lithanthrakokali Simplex.

Description : Black, hygroscopic, staining, powder; taste alkaline; odourless; prepared by adding seven parts of freshly prepared *caustic potash* in a state of fusion to five parts of finely pulverized *anthracite coal*; the vessel taken from the fire and the mixture triturated till a perfectly uniform black powder obtained.

Identification : (1) Shake about 0.1 g in 10 ml of *water* and filter; the filtrate when examined under UV light, a yellowish fluorescence observed which disappears on heating.

(2) To 10 mg of the drug add 5 ml of *water*, a brown solution formed.

Loss on drying : Loses not more than 10 percent of its weight on heating at 20° for 2 hours.

Ash value : Not more than 25 percent.

Alkalinity : Dissolve 10 g in 25 ml of *water* and filter. Not more than 7 ml of 1 N *hydrochloric acid* required for neutralisation using *phenol red* as indicator.

Water soluble matter : About 2 g weigh accurately and boil with 40 ml of recently boiled and cooled *water* for one minute, filter. Evaporate 20 ml of the filtrate to dryness and dry the residue to constant weight at 105°. Residue is not less than 10 percent.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, 361; Hering: *Guiding Symptoms*, Vol. I, 547; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 119.

Preparation : (a) Trituration 1x — Drug strength 1/10

Anthrakokali	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,.

Storage: Preserve in well-closed container.

ANTIMONIUM IODATUM

(Ant. iod.)

Chemical forumula : SbI_3 **Mol. wt.**: 502

Common name : *English*: Iodide of antimony.

Description : Ruby-red trigonal crystals; hydrolysed by *water* and moist air forming *antimony oxyiodide*; obtained by gently heating antimony and *iodine* in a dry flask, has a tendency to sublime at 100°. Soluble in *alcohol* and *acetone*, *carbon disulphide*. Insoluble in *carbon tetrachloride.*

Identification : Yields the reactions characteristic of *antimony* and of *iodides*, H.P.I., Vol. I, and

Melting point : 168°.

Assay : Dissolve about 1.0 g accurately weighed, in 5 ml *hydrochloric acid* add 10 ml *potassium bromide solution*, 0.5 g of *tartaric acid*, 25 ml of *water* and 0.5 ml of *para ethoxychrysodine solution*. Titrate with 0.1 N *potassium bromate* till a pale yellow colour is obtained. Each ml of 0.1 N *potassium bomate* is equivalent to 0.02505 g SbI_3.

History and authority : Introduced by Hale; Clarke: A *Dictionary of Practical Mat. Med.*, Vol. I, 126.

Preparation : (a) Trituration 1x — Drug strength 1/10

Antimonium Iodatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

ARGENTUM CYNATUM
(Arg. cy.)

Chemical forumula : AgCN **Mol. wt.**: 133.82

Common names : *English*: Cyanide of silver; *French*: Cyanure d' argent; *German*: Silbercyanid.

Description : A white amorphous powder, tasteless and odourless, turning brown on exposure to light. Soluble in *potassium cyanide solution* and insoluble in *water* and *alcohol*.

Identification : (i) Dissolve 0.5 g in 5 ml *nitric acid* by boiling cool, add *hydrochloric acid* drop-wise white precipitate of *silver chloride* is produced.

(ii) Dissolve 0.5 g in 5 ml of *ammonia solution* and add 2 or 3 drops of *potassium chromate*, a red precipitate is formed.

Assay : Dissolve about 2.0 g in *ammonia solution*, filter the solution, add *hydrochloric acid* drop-wise in the filterate until the complete precipitate is produced. Collect the precipitate in tared sintered crucible. Dry at 100° and weigh. Each g of *silver chloride* is equivalent 0.9333 g of *silver cyanide.*

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, 436.

Preparation : (a) Trituration 1x — Drug strength 1/10

Argentum Cynatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 3x to be protected from light.

Caution : Poison; not to be dispensed below 3x.

ARGENTUM IODATUM
(Arg. iod.)

Chemical forumula : AgI **Mol. wt.**: 234.80

Common names : *English*: Iodide of silver; *French*: Iodure d' argent; *German*: Silberjodide.

Description : An amorphous, light yellow powder; odourless; tasteless, turning greenish on exposure to light. Freely soluble in alkali cyanides and iodides; almost insoluble in *water*, acids and in *ammonium carbonate solution.* Contains not less than 98.0 percent of AgI calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields the reactions characteristics of *silver* and *iodide,* H.P.I., Vol. I,

Assay : Take about 20 mg of substance accurately weighed and wrap in a piece of ashless filter paper. Burn the substance as in *oxygen flask method,* using 10 ml of 2 N *sodium hydroxide* as the absorbing liquid. When the process is complete, add to the flask excess of *acidic bromine solution* (between 5 to 10 ml) and allow to stand for 13 minutes. Remove the excess of *bromine* by the addition of *formic acid* (about 0.5 to 5 ml), sweep out any *bromine* vapour above the liquid by current of air. Add 1 g *potassium iodide* and titrate with 0.02 N *sodium thiosulphate*, using *starch*, as an indicator. Each ml of 0.02 N *sodium thiosulphate* is equivalent to 0.000782 g of AgI.

History and authority : Introduced by Hale; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 157.

Preparation : (a) Trituration 1x — Drug strength 1/10

Argentum Iodatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, ; 6x may be converted to liquid 8x, H.P.I., Vol. I,

ARSENICUM HYDROGENATUM

(Ars. hyd.)

Chemical forumula : AsH_3 **Mol. wt.**: 77.93

Common name : *English*: Arsine.

Description : It is a colourless clear solution of arsine in Purified Water. Containing not less than 9.5 and not more than 10.5 percent arsine. Strong odour resembling garlic.

Arsine is prepared by treating *arsenic trioxide* dissolved in *hydrochloric acid* with *potassium iodide* and granulated *zinc* at 40°.

Saturated solution is freshly prepared by passing arsine in Purified Water. It contains approximately 1/5 by volume of the gas.

Identification : (1) It precipitates the metal from *silver nitrate solution.*

(2) It gives yellow precipitate with *hydrogen sulphide* which is soluble in *ammonium hydroxide*.

(3) It gives yellow stain on the paper previously, impregnated in *mercuric chloride* and then dried.

Assay : Dilute 10 ml to 100 ml with *water*. To 25 ml of this add 5 g *sodium bicarbonate* and 2 ml *starch* solution. Titrate against 0.1 N *iodine* solution slowly to first blue colouration. Each ml of 0.1 N *iodine* is equivalent to 0.000974 g of AsH_3.

History and authority : Proved and introduced by Hering; Hering: *Guiding Symptoms,* Vol. II, 104; Allen: *Encyclop. Mat. Med.* Vol. I, 550.

Preparation : (a) Mother Solution Drug strength 1/10

A saturated aqueous solution, freshly prepared, containing about 1/5 of its volume of the gas is mixed with Purified Water, so as to contain 10 percent arsine.

(b) Potencies: 2x and 3x with Purified Water; 4x and above with *Dispensing Alcohol*.

Caution : Preparations below 3x to be freshly prepared.

ARISTOLOCHIA CLEMATITIS

(Arist. cl.)

Botanical name : *Aristolochia clematitis* Linn. **Family**: Aristolochiaceae

Common name : *English*: Long Birthwort.

Description : Stem ascending or reclining, 50 to 100 cm long. Leaves broadly cordate, 5 to 10 cm long and wide, blunt to subacute, pale beneath, the broadly rounded basal auricles somewhat incurved below the rounded sinuses. Flowers in small axillary fascicles; the yellow perianth nearly straight, about 3 cm long, enlarged around the ovary, terminating in an ovate lobe on one side.

Part used : Root.

Microscopical : Cork narrow of very thin-walled cells followed by an amyliforous parenchyma zone of transversely stretched cortical cells; a cambial region separating the parenchyma from the central region the latter being composed of numerous layers of transversely stretched cells; of secondary cortex a central strand of conducting elements, with radially arranged groups of lignified tissue extending towards the cambial ring, one or more rows of large vessels being present in each radial group of lignified tissue; secretory cells embedded in the outer zone of amyliferous cortical cells.

Distribution : Indigenous to Southern Europe and England.

History and authority : First proved by Jullius Messer, *Gesichtete Homoeopathische Arzneimittellehre,* 101, 1951. English translation by J. Stephenson and E. Whitmont, *Jour. American Institute of Homoeopathy*, 52; 172, 1959.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aristolochia Clematitis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture three parts, Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ARUM DRACONTIUM
(Arum. d.)

Botanical name : *Arisaema dracontium* Schutt. **Family**: Araceae

Common names : *English*: Dragon; *French*: Govet a dragon: *German*: Drachenaron.

Description : A deciduous, perennial herb with wrinkled clustered corm from which arise numerous stems, up to 60 cm high each bearing solitary, long petiolated leaf, which is pedately divided into 7 to 10 oblong, lanceolate, pointed leaflets. Leaflets elliptic to oblanceolate or acuminate narrowed at the base. Peduncle arising from one of the basal sheaths shorter then petiole. Spathe green, slender, convolute, 3 to 6 cm long, pointed; spadix and eel-shaped, longer than sapathe. Berries orangish-red.

Part used : Root.

Identification : Take about 20 ml of 50 percent alcoholic extract of the drug and warm on water bath to remove *alcohol*. Divide the aqueous part in two. Make one part alkaline with *ammonia* solution. Then extract with *chloroform* (*Chloroform* layer A). Extract the second aqueous portion with *chloroform* directly without making it alkaline (*Chloroform* layer B).

(a) Carry out TLC of *chloroform* extract 'A' on silica gel 'G' plate using *chloroform* : *methanol* (95 : 5 v/v) as mobile phase and *iodoplatinate* as spray reagent. One violet colored spot appears at R_f 0.53, which is different from Nicotine.

(b) Carry out TLC of *chloroform* extract 'B' on silica gel 'G' plate using *chloroform: methanol* (95 : 5 v/v) as mobile phase. Two spots at R_f 0.13 and 0.15 (blue fluorescene) appear under UV light. On spraying with *antimony trichloride* as spray reagent, one violet spot develops at R_f 0.15.

Distribution : Found in low grounds along streams of North America.

History and authority : Introduced and proved by Dr. C. P. Hart, *Am. Hom. Obs.*, 1875, 537; Allen: *Encyclop. Mat. Med.*, 363; Hering: *Guiding Symptoms*, Vol. II, 161; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 196.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Arum Dracontium *in coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

ARUM MACULATUM
(Arum. mac.)

Botanical name : *Arum maculatum* Linn. **Family**: Araceae

Synonym : *Arum vulgare* Lam.

Common names : *English*: Common Arum; *French*: Pied de vasu; *German*: Aronswurzel.

Description : A perennial herb, about 30 cm high. Leaves usually black spotted, hastate or sagitate, the front leaves triangular-ovate, about as high as the spathe; spathe somewhat contracted above the base, the margins of the limb becoming inrolled, spotted, purple; spadix shorter than the spathe and purple.

Part used : Root.

Macroscopical : Large tuberous somewhat resembling those of potato, oblong, about the size of pigeon's egg, brownish externally, white within and when fresh, fleshy, yielding a milky juice, almost insipid to taste at first, but soon producing a burning and pricking sensation, odour acrid irritating the nose especially when bruised, the acridity is lost during the process of drying.

Distribution : Middle and Southern Europe.

History and authority : Introduced in 1833 by Dr. Hering, *Archives* 13, 1969; Allen: *Encyclop. Mat. Med*., Vol. I, 560; Hering: *Guiding Symptoms*, Vol. II, 166.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Arum Maculatum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	630 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ASARUM EUROPAEUM

(Asar. eur.)

Botanical name : *Asarum europaeum* Linn. **Family**: Aristolochiaceae

Common names : *Hindi*: Upana; *English*: Asarabacca; *French*: Cabaret de l' Europe; *German*: Hazel wurz.

Description : A perennial, pubescent herb, consisting of a very short fleshy stem. Leaves kidney-shaped, evergreen, dark green, petiole 7.5 to 12.5 cm. Flowers greenish-purple, solitary 1.3 cm, with incurved 3-lobes; stamens 12, with tips on the filaments projecting beyond the anthers; styles 6, grooved or 2-parted, recurved, ovary inferior. Fruit a fleshy globular capsule, 6-celled.

Part used : Whole plant.

Macroscopical : Creeping, fibrous of greyish-brown colour with whitish rootlets, quadrangular, entwined twisted, 5 to 10 cm long and up to 2 mm in thickness, odour altogether analogous to that of pepper; taste acrid.

Microscopical : Rhizome: the presence of a grey cork and below it 4 to 5 rows of collenchymatous cells, the rest of the cortical parenchyma is formed of polyhedric cellulosic cells rich in starch. Endodermis not as thick as the pericycle, which limits a central cylindrical formed of several vascular bundles of conical appearance arranged in circles and delimiting an abundant with cellulosic polyhedral cells.

Leaf: dorsiventral, simple, uniseriate trichome; epidermis papillose on the upper and lower surface; secretory cells present and oils in the secretory cells is enclosed by a membrane. Crystals frequent and occurs in the form of prisms, needles and clustres.

Distribution : Central and South Europe, Temperate Asia and Asia minor.

History and authority : Introduced by Hahnemann in 1817, *A. M. L.* III (1825); Hahnemann; *Materia Medica Pura*, Vol. I, 166; Allen: *Encyclop. Mat. Med*., Vol. I, 582; Hering: *Guiding Symptoms,* Vol. II, 205.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Asarum Europaeum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ASTERIAS RUBENS
(Ast. rub.)

Zoological name : *Asterias rubens* Linn. **Family**: Asteroidea

Common name : *English*: Common starfish.

Description : Star-shaped body consisting of a central disc and 5 symmetrically arranged arms. In the centre of ventral surface is the mouth guarded by 5 inter-radial jaws radiating from it are 5 narrow groves, each occupying the ventral surface on one of the arms. Bordering the furrows are 2 to 3 rows of movable adambulacral spines. Lateral to these are 3 rows of stout ventro-lateral spines which are not movable. On the convex dorsal surface there are short stout spines arranged in irregularly shaped ossicles in the integument. In the interspaces between the ossicles are minute dermal pores through each of which project a small soft respiratory process (papula). Near the centre of dorsal surface is the anus.

Part used : Entire animal.

Microscopical : In cross section the dorsal wall of the arm present the appearance of an arch and the ventral part is shaped like an inverted 'V', the ambulacral furrows enclosing a part of coelom. The dorsal arch is perforated by dermal bronchias. The wall of ambulacral groove is made up of 2 rows of ambulacral ossicles. At the end of the arm is median terminal ossicle. The coelom (body cavity) is lined by a ciliated epithelium.

Distribution : Common along the various coasts of Europe and is found in American Coasts.

History and authority : Proved and introduced by Petroz; Allen: *Encyclop. Mat. Med*., Vol. I, 602; Hering: *Guiding Symptoms*, Vol. II, 242.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Asterias Rubens, containing solids 100 g, moisture 400 ml	500 g
Strong Alcohol	637 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture and three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

ATROPINUM SULPHURICUM
(Atr. sul.)

Chemical forumula : $(C_{17}H_{23}O_3N)_2 H_2SO_4.H_2O$ **Mol. wt.**: 694.82

Common names : *English*: Atropine sulphate; *French*: Sulfatid; *German*: Atropinsulfat.

Description : Colourless crystals or white crystalline powder; odourless. Fused by heat, it assumes a red colour and volatilises entirely. A solution having 1/1000 part of atropine sulphate has a very bitter taste. Precipitates by sodium carbonate or barium chloride very soluble in *water* and *alcohol*. Slightly soluble in *chloroform*; practically insoluble in solvent *ether*.

Identification : (i) Dissolve 100 mg of salt in 10 ml of *water*; acidify with *hydrochloric acid* and add solution of *gold chloride*, a lemon yellow precipitate is produced. Filter and recrystallise the precipitate with boiling *water*, acidified with *hydrochloric acid*; a minutely crystalline precipitate is produced, melting point range 133º to 139º.

(ii) Add 10 mg to 5 drops of *fuming nitric acid* and evaporate to dryness on water bath, the residue is faintly yellow in colour and on cooling and moistening with freshly prepared 10 percent w/v solution of *potassium hydroxide*, in *acetone*, it assumes violet colour.

(iii) Dissolve a few crystals in *water* and make it alkaline with dilute *ammonia* solution, extract with chloroform until complete extraction is affected. Then carryout the TLC on *silica gel* 'G' plate having mobile phase *ammonia* : *methanol* (1.5 : 100) and *acidified iodoplatinate* as spray reagent, a violet spot develops at R_f 0.18.

(iv) Gives reactions characteristic of *sulphates*, H.P.I., Vol. I,

Melting point : Between 191° to 195° (after drying at 130° for 15 minutes).

Sulphated ash : Not more than 0.1 percent.

Loss on drying : Loses not more than 4.0 percent when dried at 120° for 3 hours.

Assay : Weigh accurately about 0.2 g and add 25 ml of *water* and 10 ml of *dilute ammonia solution*. Extract with successive quantities, each of 20 ml of *chloroform* until complete extraction of atropine is effected, washing each extract with 10 ml of *water*. Remove the chloroform and add 2 ml of *alcohol*, add 20 ml of 0.1 N *hydrochloric acid* and titrate excess of acid with 0.1 N *sodium hydroxide*, using solution of Methyl red as indicator. Each ml of 0.1

N *hydrochloric acid* is equivalent to 0.0338 g of $(C_{17}H_{22}O_3N)_2 H_2SO_4$.

History and authority : First proved by Eidhera, A.H.Z., 60, 11 et; Allen: *Encyclop. Mat. Med*., Vol. I, 608.

Preparation : (a) Trituration 1x — Drug strength 1/10

Atropinum sulphuricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

(c) Mother Tincture ϕ — Drug strength 1/10

Atropinum sulphuricum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

Potencies: 2x and higher with *Dispensing Alcohol*.

BARYTA ACETICA
(Bar. Acet.)

Chemical forumula : $(CH_3CO_2)_2Ba$ **Mot. wt.**: 255.45

Description : White crystals or crystaline powder; freely soluble in *water;* slightly soluble in *alcohol*. It contains not less than 99.0 percent of $C_4H_6O_4Ba$ calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields the *reactions* characteristic of *barium,* H.P.I., Vol. I, and *acetates,* H.P.I., Vol. I,

Reaction : pH of 5.0 percent w/v solution is between 6 and 8.5.

Free acid alkalinity : Dissolve 3.0 g in 30 ml of *water* and add 3 drops of *phenolphthalein*, not more than a faint pink colour is produced. It does not show any effervescence on adding a few drops of dilute *hydrochloric acid*. If no pink colour is produced, it requires not more than 1 ml of 0.1 N *sodium hydroxide* to produce a pink colour.

Chlorides : 10 g complies with the *limit test for chlorides*; H.P.I., Vol. I,.

Heavy metals : Not more than 10 parts per million, H.P.I., Vol. I,

Iron : 4 g complies with the *limit test for iron,* H.P.I., Vol. I,

Assay : Dissolve about 0.7 g accurately weighed in 200 ml of *water*. Neutralise the solution. Add 1 ml of 6 N *acetic acid* and 10 ml of neutral 3 N *ammonium acetate*, heat to boiling and add hot dilute *ammonium chromate solution* through a burette drop by drop with constant stirring for complete precipitation. Place the beaker on water bath until the precipitate settles. Test the completion of the precipitate by adding a few more drops of *ammonium chromate solution*. Cool and filter through a tared porcelain or sintered glass crucible. Wash with hot *water* until the washings gives scarcely any reddish-brown colouration with neutral *silver nitrate solution*. Dry to constant weight at 120º. Weigh as *Barium chromate*.

History and authority : Introduced and proved by Adams, Stapf. Hartmann, Ruckert, Gross and Hartlaub; Hahnemann: *Chronisch Krankheitn* 2, 245; Allen: *Encyclop. Mat. Med*., Vol. X, 42, 372.

Preparation : (a) Mother Solution ϕ — Drug strength 1/10

Baryta Acetica	100 g
Strong Alcohol	250 ml
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x to contain one part Mother Solution, two parts *Strong Alcohol* and seven parts Purified Water; 3x and higher with *Dispensing Alcohol*.

(c) Trituration 1x	Drug strength 1/10
Baryta Acetica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol.

BARYTA IODATA

(Bar. iod.)

Chemical forumula : BaI_2 **Mol. wt.** 391.18

Common names : *English*: Barium iodide; *French*: Iodure de baryum; *German*: Jodbarium.

Description : Colourless, small slender needles, deliquescent. Freely soluble in *alcohol* and in *water*. Rapidly becomes reddish in air due to liberation of *iodine*; aqueous solution neutral or faintly alkaline. It should contain not less than 98.0 percent of BaI_2 with reference to substance dried to constant weight at 105°.

Identification : It gives reactions characteristic of *barium* and *iodides*.

Sulphate : No turbidity is produced in one minute on adding *barium chloride solution* to 1 in 20 solution of this salt in *water*.

Heavy metals : Not more than 20 parts per million, H.P.I., Vol. I

Carbonate : A solution of 1 in 20 solution does not give any effervescence on addition of *hydrochloric acid*.

Acidity or alkalinity : A solution of 1 in 20 in freshly boiled *water* remains neutral to a *solution of litmus.*

Phosphate : A solution in *nitric acid,* 1 in 5 gives no yellow precipitate with 5 ml solution of *ammonium molybdate.*

Loss on drying : When dried to constant weight at 105° loses not more than 2 percent of its weight.

Assay : Weigh accurately about 0.2 g, dissolved in 10 ml of percent of *hydrochloric acid*, heat to boiling and add slowly 1 N *sulphuric acid* with stirring till the precipitate is complete. Digest on water bath until the precipitate has settled. Filter, wash with hot *water* containing two drops of *sulphuric acid* per litre and then with *water* until free from acid. Ignite at 900° to 1000° and weigh as $BaSO_4$. Each g is equivalent to 1.24 g of BaI_2.

History and authority : Clarke: *A Dictionary of Practical Materia Medica*, Vol. I, 253.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Baryta Iodata 100 g

Dilute Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

BLUMEA ODORATA

(Blam. odo.)

Botanical name : *Blumea obovata* DC. **Family**: Compositae (Asteraceae)

Synonym : *Conyza obovata* Wall.

Common name : *Hindi*: Kuksima.

Description : A herb; stem and panicle softly densely villous. Leaves narrowed into a short petiole, obovate, lanceolate, acute or acuminate, faintly or coarsely toothed, membranous, glabrous above, tomentose beneath. Heads or capitulae a few, 1.9 cm in diameter on simple or branched peduncles at the end of a very long almost naked branch; involucral bracts villous, slender and shining; receptacle with a very few hairs, corollas lobes glandular; pappus white.

Part used : Whole plant excluding roots.

Identification : A 10 ml of 10 percent aqueous alcoholic extract (10 g of drug extract in 100 ml, 50 percent *ethanol*) is evaporated to dryness and then 25 ml *water* is added to this residue. Now extract it with *chloroform*.

(i) To 2 ml of the *chloroform* solution add a small amount of *boric acid* and 1 ml of concentrated *sulphuric acid*, precipitate appears after sometime.

(ii) To 2 ml of the *chloroform* solution add 1 ml of concentrated *nitric acid*, a yellow colour is produced.

(iii) To 2 ml of the *chloroform* solution add 1 ml of 10 percent *sodium hydroxide* solution, a red colour is produced.

Thin layer chromatography : Carry out the Thin layer chromatography of *chloroform* extract (obtained above) over silica gel 'G' plate using *chloroform* : *methanol* (1 : 1) as mobile phase a blue fluorescent spot under UV light having R_f 0.7 is observed on spraying it with 50 percent *methanolic sulphuric acid* and heating, the fluorescent spot turns black.

Distribution : Throughout India.

History and authority : Ghose: *Drugs of Hindoosthan*, 7th Ed., 92.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Blumea Odorata, containing solid 100 g and plant moisture 542 ml	642 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture two parts Purified Water and seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Original Monograph Appeared in HPI Vol. II

CADMIUM SULPHURICUM
(Cad. sul.)

Chemical forumula : $3CdSO_4.8H_2O$ **Mol. wt.**: 769.31

Common name : *English*: Cadmium Sulphate.

Description : Colourless monoclinic crystals; odourless; taste astringent and metallic; efflorescent in air. Loses *water* at 40°. Soluble in *water;* insoluble in *alcohol.* Contains not less than 99.0 percent of $3CdSO_4.8H_2O$ with reference to the substance dried to constant weight over *silica gel*.

Identification : Yields reactions characteristic of *cadmium* and of *sulphates*.

Free acid : To a solution containing 1 g in 30 ml of *water* add two drops of *methyl orange;* the colour is yellow to orange yellow, but not red.

Alkali earth : Dissolve 2 g in 145 ml of *water* and add 5 ml of 10 percent *sulphuric acid*. Heat to boiling and precipitate the cadmium with *hydrogen sulphide*. Filter, evaporate 75 ml of the filtrate with 5 drops of *sulphuric acid* and ignite. Leaves not more than 1.0 mg of residue.

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I

Iron : 4 g complies with the *limit test for iron*, H.P.I., Vol. I.

Lead : Dissolve 1 g in 1 ml of *water* add 5 drops of *glacial acetic acid* and 0.2 ml of *potassium chromate solution*. No turbidity is produced in 5 minutes, H.P.I., Vol. I

Assay : Dissolve 1 g in 50 ml of *water*, add 25 ml of strong *ammonia solution* and titrate with 0.1 N *disodium edatate*, using *methyl thymol blue mixture* as indicator until the solution becomes colourless. Each ml of 0.1 M *disodium edetate* is equivalent to 0.02565 g of $3CdSO_4.8H_2O$.

History and authority : Proved and introduced by Petroz in 1854; Hering: *Guiding Symptoms*, Vol. III, 9x; Allen: *Encyclop. Mat. Med*., Vol. II, 330.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cadmium Sulphuricum	100 g
Saccharum Lactic	900 g

to make one thousand grams of the Trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

(c) Mother Solution ϕ — Drug strength 1/10

Cadmium Sulphuricum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x and 3x with Purified Water; 4x and higher with *Dispensing Alcohol.*

Caution : Preparations below 3x to be freshly prepared.

CALADIUM SEGUINUM
(Cal. seg.)

Botanical name : *Caladium seguinum* Vent. **Family**: Araceae

Common names : *English*: Poison American Arum; *French*: Pediveau vehev, English eux; *German*: Schierlings caladium.

Description : A small arborescent palm like evergreen under shrub. Stem 1.5 to 1.8 m high, slender, spotted or scarred by remains of fallen leaves. Leaves ovate, oblong, undulated, acute often perforated and with a thick midrib. Spathes axillary, 12.5 to 15 cm long, oblong, stalked, convolute with the apex of spadix just protruding, spadix cylindrical, male wholly at apex, female with abortive stamens intermixed at the base and naked in the middle. Flowers white.

Part used : Whole plant.

Microscopical : Leaf: epidermis single layered, sinuous with papillose cells, stomata on both surfaces, paracytic, sparsely distributed; collenchyma in veins, 3 to 4 layered; mesophyll undifferentiated, highly spongy, midrib with vascular bundles scattered, amphicribal (xylem in centre); aggregates of calcium oxalate crystals and numerous acicular raphides both in the mesophyll and parenchyma of veins; raphides intracellular. Stomatal number 1 to 2 per sq. mm for upper epidermis and 3 to 4 per sq. mm for lower epidermis.

Petiole: horse-shoe or arc-shaped with single layered sinuous, papillose, in transection of collenchyma up to 10 layers, ground tissue parenchymatous formed of highly spongy of large cells containing several scattered amphicribal vascular bundles, aggregates of calcium oxalate crystals and raphides.

Stem: cork 7 to 12 layered; collenchyma angular, 8 to 15 layered; ground tissue composed of oval, isodiametric parenchyma cells and intercellular spaces; vascular bundles amphivosal (phloem in centre), closed, scattered, encircled by a layer of parenchyma cells, a few with xylem elements only, numerous calcium oxalate crystals and accicular raphides, 123 to 153 µ long, scattered throughout the parenchyma.

Distribution : West Indies and South America.

History and authority : Proved by Hering, *Archiv. F. Hom. Heilk.,* 11, 2, 16; Allen: *Encyclop. Mat. Med.*, Vol. II, 387, X, 398.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Caladium Seguinum in *coarse powder*	100 g
Purified Water	500 ml

Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong alcohol*; 3x and higher with *Dispensing alcohol*.

CALCAREA OXALICA
(Cal. Oxal.)

Chemical formula : $CaC_2O_4.H_2O$ **Mol. wt.**: 146.09

Common name : *English*: Calcium oxalate.

Description : White cubic crystalline powder; odourless; tasteless, soluble in dilute *hydrochloric acid* and in dilute *nitric acid*; almost insoluble in *water, acetic acid;* and in *alcohol*. At a red heat it is decomposed into carbon monoxide and calcium carbonate; a further decomposition takes place at higher temperature, the calcium carbonate being decomposed into carbon dioxide and calcium oxide. It is prepared from soluble salt of calcium and oxalic acid. It contains not less than 99.0 percent of $CaC_2O_4.H_2O$ with reference to the substance dried to constant weight at 100°.

Identification : Dissolve 100 mg in *dilute hydrochloric acid,* dilute it with *water* and divide in two equal parts.

(a) To one part add *sodium bicarbonate* to complete neutralisation then add a drop of 1 percent *potassium permanganate*. The pink colour appears which doesn't disappear on heating but disappears on adding a few drops of *dilute sulphuric acid*.

(b) To the second portion, add a drop of *phenolphthalein* and add *ammonia solution* till pink colour appears, white precipitate is produced.

Assay : Dissolve about 0.1 g, accurately weighed in 10 ml of *dilute hydrochloric acid* and 20 ml of *water* in a conical flask, add 2 to 4 ml of *dilute sulphuric acid* heat on water bath at 50º to 60° and titrate with 0.1 N *potassium permanganate solution*. Each ml of 0.1 N *potassium permanganate* is equivalent to 0.073045 of $CaC_2O_4.H_2O$.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 358.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Oxalica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

CALCAREA OVA TESTA

(Ova. t.)

Description : A white or pinkish-white powder. Practically insoluble in *water*, soluble in mineral acids, liberating carbon-dioxide. It is prepared from the shell of eggs. The Calcarea Ova Testa contains several compounds of calcium i.e. calcium carbonate, oxalate and lactate. Total calcium as per assay method should be not less than 34 percent.

The Calcarea Ova Testa is obtained from the shells of hen's egg. Shells are taken after removing the inner thin membranous layer and grinded to powder which constitutes the main drug.

Identification : Its solution in *dilute hydrochloric acid,* yields reactions characteristic of *calcium salts*, H.P.I., Vol. I, *oxalates* and *lactates*, H.P.I., Vol. III,

Assay : Take about 1 g accurately weighed, add 50 ml of 1 N *hydrochloric acid*, heat to dissolve completely. Titrate the excess of acid with 1 N *sodium hydroxide*. 1 ml of 1 N *hydrochloric acid* is equivalent to 0.02 g of Ca. Using *methyl orange* as indicator.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 358.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Ova Testa in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

CEDRON
(Cedron)

Botanical name : *Simaba cedron* Planch. **Family**: Simaraubaceae

Common names : *English*: Rattle Snake beans; *French*: Cedron; *German*: Cedron-Bohve.

Description : A small tree, stem 15 cm or less in diameter with branching top. Leaves large, glabrous, pinnate. Flowers pale brown in long branching racemes. Fruit a drupe containing single seed, yellowish-green colour, flat-ovate, with one edge convex and other almost straight, the convex terminating in a blunt point, 5 cm long up to 2.5 cm in breadth.

Part used : Seed.

Macroscopical : Seed about 5 cm long, up to 2.2 cm broad and up to 1.3 cm in thickness; convex on one side and flat or slightly concave on the other; an oval scar near the extremity on flat side; yellowish coloured, hard, tough and compact in texture but cuts readily; odourless; taste intense bitter.

Microscopical : Powder: yellowish to yellowish-orange in colour; yellowish thin-walled, tri or hexagonal cells of testa; oval thin-walled cells of cotyledons enclosing starch grains; annular xylem vessels, branched thin-walled secretory ducts; starch-grains oval, sometimes 4 compound with hilum centre having radiating cleft and 6.75 µ to 13.5 µ in diameter.

Distribution : West Indies and United States.

History and authority : Introduced by Patroz and Teste and proved by Metcal and J. Douglas; Allen: *Encyclop. Mat. Med*., Vol. III, 70; Hering: *Guiding Symptoms*, Vol. III, 472.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cedron in moderately *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

CEPHALANDRA INDICA
(Ceph. ind.)

Botanical name : *Cephalandra indica* Naud. **Family**: Cucurbitaceae

Synonyms : *Coccinia indica* W. & A., *C. cordifolia* (Linn.) Cogn.

Common names : *English*: Ivy gourd; *Hindi:* Kundru.

Description : A climbing or prostrate perennial shrubs, with much branched tuberous roots. Stem grooved slender, glabrous, tendrils slender, striate, simple. Leaves 5 to 10 cm in length, 5 lobed, connate, shining and scabrid. Flowers white or yellow, dioecious. Male flowers solitary or subcymose at the apex of a peduncle; calyx short campanulate, shortly 5-lobed, stamens 3, filament connate into a column, rarely free, anthers cohering, the cells, conduplicate; ovary rudimentary. Female flower solitary with calyx and corolla as in male flower; rudimentary stamens 3, short or long, ovary ovoid or ellipsoid, placenta 3; ovules many, horizontal; style slender; stigmas 3, bifid. Fruit, smooth and bright green with strips when immature, becoming bright scarled red when ripe. Seeds many, ovoid, compressed, margined; testa smooth or scrobiculate.

Part used : Leaf.

Macroscopical : Leaves 5 to 10 cm long and 3.5 to 7 cm broad, bright green above, paler beneath, studded and sometimes rough and papillae, palmately lobed, 5-nerved from cordate base, often with circular glands, between nerves, obtusely 5-angled or sometimes deeply 5-lobbed, the lobes broad obtuse or acute, apiculate, more or less sinuate toothed. Petiole 2 to 3.2 cm long. Tendril slender striate, simple.

Microscopical : Epidermal cells with sinuous anticlinal walls, cells of the adaxial surface of leafless wavy than of abaxial; anomocytic stomata, 22 to 27 µ in length and 12 to 18 µ in breadth with pore 12 to 16 µ; mesophyll differentiated into palisade and spongy parenchyma, palisade 1 to 2 layered, spongy tissue 3 to 7 cell thick; vascular bundles 2 in the mid-rib, one above the other the lower being largest, bicollateral; extrafloral nectaries or glands, 500 µ in length and 122 µ in breadth on the dorsal or lower epidermis of leaf on the lamina only, but abundantly present at the base on both sides of the midrib, absent on margins; each gland consists of only few epidermal cells arranged in a circle below which is ordinary mesophyll tissue. In longitudinal section a gland is semicircular in appearance, its flat side being either continuous with lower epidermis of leaf or slightly depressed. It is surrounded by a layer of semi circularly arranged suberized thick-walled cells (superficial tissue) except on the epidermal side, the cells of which are thin-

walled, non-lignified, cells of superficial tissue surrounded by colourless patches of mesophyll with tracheidal ends. Hydathodes 21 μ in length and about 10.5 μ in breadth, present in the leaf teeth. Cystoliths present, appear as dots in upper epidermal cells.

Distribution : Throughout India at low elevations.

History and authority : Introduced and proved by Ghose, *Drugs of Hindoosthan*, 7th Ed., 124.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cephalandra Indica fresh pulp containing solid 100 g and plant moisture 616 ml	716 g
Strong Alcohol	410 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four part Purified Water and 5 parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VIII

CHELONE GLABRA

(Ch. glab.)

Botanical name : *Chelone glabra* Linn. **Family**: Scrophulariaceae

Synonym : *C. oblique* var. *alba.* Hort.

Common names : *English*: Balmony; *French*: Chelone; *German*: Glatte Chelone.

Description : A perennial herb, about 1 m high, erect, simple and branched above. Leaves mostly linear, acuminate, appressed, serrate, nearly sessile or nearly so; spikes 3 to 8 cm long, subtended by scarcely reduced foliage leaves; bracts not ciliated. Flowers white or rose-tinged; corolla billped, the lower lip bordered in the throat; anthers heart shaped, filaments woolly. Odour slight somewhat tea-like; taste bitter.

Part used : Whole plant.

Identification : (i) To 2 ml extract in 50 percent alcohol add 1 ml of 10 percent *sodium hydroxide solution;* a red precipitate is produced.

(ii) To 2 ml of similar extract add 1 drop of *alcoholic ferric chloride* solution; a dark green colour is produced.

(iii) To 2 ml of the similar extract add 1 drop of *ammonium ferric sulphate* solution; a dark red colour is produced.

Distribution : Eastern United States and Canada.

History and authority : Introduced and proved by Hale, *New Ram.* 2nd Ed. 19; Clarke: *A Dict, of Practical Mat. Med.*, Vol. I, 467.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Chelone Glabra in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts Purified Water and five Parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol*.

CISTUS CANADENSIS
(Cist. can.)

Botanical name : *Helianthemum canadense* Mich. **Family**: Cistaceae

Synonyms : *Helimium canadensis* Oresser, *Crocanthemum canadense* B. et B.

Common names : *English*: Frost weed; *French*: Le ciste canade; *German*: Canadisches Sonnenroschen.

Description : Upright 30 to 60 cm, hoary pubescent. Leaves nearly sessile, oblong to linear-lanceolate acute, pale beneath, entire 2 to 3 cm long. Flowers 2.5 cm across, large, yellow on solitary peduncles, sepals 5, the outer linear the inner ovate, tomentulose; petals 5, 15 to 25 mm long; ovary tricarpellary. Fruit a loculicidal capsule, 3 to 3.5 mm in diameter.

Part used : Whole plant.

Distribution : Maine to Wisconsin and southward, in dry sandy soil, rare west of Allegharies; also found in Canada.

History and authority : Proved and introduced in 1835 by Bute; Allen: *Encyclop. Mat. Med*., Vol. III, 333; Hering: *Guiding Symptoms*, Vol. IV, 218.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cistus Canadensis in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x is contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CLEMATIS ERECTA
(Clem. er.)

Botanical name : *Clematis erecta* Linn. **Family**: Ranunculaceae

Common names : *English*: Upright Virgin's Bower; *French*: Clematite droite; *German*: Brennende Waldrebe.

Description : Herbaceous, somewhat tuft, up to 1 m long. Leaves large opposite, pinnate; leaflets 5 to 9, petioled, ovate, acuminate, entire and pubescent beneath. Flowers numerous on a large, branching terminal panicle, white, sweet-scented, 2.5 cm across. Seeds dark brown, smooth, orbicular, much compressed, tails long, yellowish and plumose.

Part used : Leaf and stem.

Macroscopical : Stem up to 1 m high, leaf, striated, herbaceous, greenish or reddish. Leaves have an acrid, burning taste, the acridity being greatly diminished by drying. It blisters tongue when chewed.

Distribution : Central and Southern Europe.

History and authority : Proved and introduced in 1828 by Hahnemann: *Chronic Diseases*, 608; Allen: *Encyclop. Mat. Med*., Vol. III, 340; Hering: *Guiding Symptoms*, Vol. IV, 231.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Clematis Erecta in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CUCURBITA PEPO

(Cucur. p.)

Botanical name : *Cucurbita pepo* Linn. **Family**: Cucurbitaceae

Common names : *English*: Pumpkin; *Hindi*: Kaddu.

Description : An annual, monoecious climber, with dark green, non-glossy, 3 to 5 lobed leaves and prickly stems and petioles. Flowers large, yellow, arranged singly in the axils of leaves. With the gradual widening of the corolla towards the top, its lobes become upright and pointed. Calyx lobes narrow, not leaf-like; peduncle very hard and deeply furrowed when mature. The fruit differs in size and shape in the many cultivated varieties.

Part used : Seed.

Microscopical : Seed coat with distinct outer and inner integuments. Outer integument consisting of an epidermal layer with little or no cuticle; epidermal cells prism shaped, compactly arranged, radially elongated; forming a ridge at the border where cells are several times as long as those on flattened lateral surface of the seed. Epidermal cells with outer walls thick, radial walls very thin with cellulose strands extending from base of cells frequently branching towards outer walls; a hypodermal zone of 3 to 5 layers of small thick-walled pitted, polygonal compact and somewhat elongated cells, a single layered zone of sclerenchyma except at margins and a zone of longitudinally elongated cells, arranged in rows, appearing sinuous with infolding in surface view. Inner integument parenchymatous consisting of three zones, the outer of small cells having no intercellular spaces; the intermediate 2 layered consisting of stellate cells with reticulate thickenings and large intercellular spaces forming cavities; the inner forming a true spongy tissue of thin-walled cells which are chlorenchymatous in the inner-most layers; an inner epidermis of single layer of small thin-walled cells. Nuclear tissue, about 6 layered of small thin-walled cells, except for the outer-most layer where they are cuticularised. Endosperm single layered of thin-walled cells with granular contents and large nucleus. Cotyledons 2, with aleurone grains.

Distribution : Cultivated throughout India.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 629.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cucurbita Pepo seeds containing solids 100 g and plant moisture 83 ml	183 g
Strong Alcohol	950 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher in *Dispensing Alcohol*.

CURARE
(Curare)

Common name : *English:* American arrow poison.

Description : The drug consists or dried extract in form of blackish brittle, resinous mass obtained from *Strychnos toxifera* Sch. and Benth of family Loganiaceae. It is hygroscopic and sparingly soluble in *water* and *alcohol*, is usually made by infusion of the bark and stem with hot *water* (200 g of powdered plant material in 2 litres of *water*) over a period of several days followed by removal of plant material by straining and subsequent slow evaporation of the aqueous extract to a brown to black syrupy mass gradually transforming into brittle resinous mass. Though little variation in composition has been reported depending on the region of growth of the plant, the drug responds to tests for tubocurarine.

Identification : (1) Solution in *alcohol* gives red colour.

(2) Solution in *water* with *mercuric nitrate* turns red.

(3) Solution in *water* with *ferric chloride* gives green colouration which, on warming becomes brown.

(4) Absorption max 280 mμ.

History and authority : Proved and introduced by Schlosser, *Allg. Hom. Zeit,* 55, 137; Allen: *Encyclop. Mat. Med.*, Vol. IV, 37; Vol. I, 644; Hering: *Guiding Symptoms*, Vol. V, 54.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Curare in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CYCLAMEN EUROPAEUM
(Cycl. eur.)

Botanical name : *Cyclamen europaeum* Linn. **Family**: Primulaceae

Synonyms : *Cyclamen clusii* Lindle, *C. aestivam* Reich, *C. cordifolium* Stokes, *C. orbiculatum* Mill, *C. purpurascens* Mill.

Common names : *English*: Snow-bread; *French*: Pain de pourceau; *German*: Schweinsbrod.

Description : Herbaceous and low evergreen plant with tuber, having corky exterior. Leaves ovate, orbicular or reniform, entire or nearly so, with a deep and narrow basal sinus, more or less white, marbled above, purple-tinted beneath. Flowers on scapes 11.5 cm high, bright red and very fragrant, not spotted; calyx glabrous; corolla-segments oblong, spathulate, up to 2 cm; pedicel spirally coiled on flowering.

Part used : Root.

Macroscopical : Tubercle 1 to 5 cm, flattened on the whole surface, shape of a disk with wrinkled outer surface black externally and white internally with numerous starch cells; odourless; taste bitter, acrid and burning.

Distribution : Central and southern Europe.

History and authority : Proved and introduced by Hahnemann: *Materia Medica Pura*, Vol. I, 541; Allen: *Encyclop. Mat. Med*., Vol. IV, 46; Hering: *Guiding Symptoms*, Vol. V, 63.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Cyclamen Europaeum in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	750 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

DAPHNE INDICA

(Daph. ind.)

Botanical name : *Daphne indica* Hook and Arn. **Family**: Thymelaceae

Synonyms : *Wikstroemia foetida* (L. f.) A. Gray, *Daphne foetida* Forst.

Common names : *English*: Sweet-scented Spurge Laurel; *French*: Laureola de Chine; *German*: Lorbeer blatteriger Spitzenbast.

Description : An evergreen shrub, 60 cm to 1 m high, with erect stem branching at the top, branches glabrous or slender, silky-hairy. Leaves ovate and obtuse to ovate-lanceolate and acute to oblong-lanceolate and tapering at both ends, up to 5 cm long, thin and glabrous. Flowers very shortly pedicellate in small terminal heads, sometimes in short spikes; perianth greenish-yellow, glabrous or slightly hairy, tubular hypogynous scales 4, small narrow, approximate in opposite pairs, sometimes the two connate at the base; fruit a drupe, red, about 1.3 cm in diameter with the endocarp rather hard.

Part used : Bark of branches.

Identification : (i) Extract 5 g of the drug with 50ml *alcohol*, filter and to 1ml add 10 ml dilute *sodium hydroxide* solution; yellow colour is produced.

(ii) To 10 ml of the above alcoholic extract add 2 ml dilute *hydrochloric acid* and heat on water-bath to dryness. Extract the residue in *ether*. Dry with anhydrous *sodium sulphate* and then concentrate by evaporation. To the aqueous solution of the concentrate add a few drops of *alcoholic ferric chloride* solution; green colour is produced which turns red on addition of *sodium carbonate.*

Distribution : West Indies and China.

History and authority : Proved and introduced by Bute in 1837; Allen: *Encyclop. Mat. Med*., Vol. IV, 66; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 655.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Daphne Indica in moderately *coarse powder* 100g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration 1x	Drug strength 1/10
Daphne Indica in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I,

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DIPHTERINUM
(Diphth.)

Microbiological name : *Corynobacterum dephtheriae* Klebs and Loffler 183-84.

History and authority : Proved and introduced by Frash; Allen: *Materia Medica of Nosodes*, 36. Clarke: A *Dictionary of Practical Materia Medica*, Vol. I, 675.

Biological distribution : Organism present in skin and mucous membrane of pharynx, larynx, trachea and nose, subject to suffering from diphtheria.

Source of preparation of Homoeo, Drugs (Part used) : Membrance, Diphtheria infected.

Description : The club form is only one of many shapes which may be assumed by the individual cells of the type species *C. diphtheriae*. This organism is indeed characteristically aloemorphis. One of the most typical forms in films prepared from a 24 hours' culture on loeffler's serum is that of a long, rather slender bacillus, often slightly curved, with rounded somewhat swollen ends and sometimes with localised swellings elsewhere and staining unevenly with such dyes on *methylene blue* in the presence of *meta chromatic granules* is characteristic features. A single cell may obtain one or more of these granules. These granules are coloured reddish-purple, when a film preparation is stained with a suitable sample of *methylene blue*. These are green positive and are non-capsulated, non motile and non-flagellated.

Cultural characteristics : *On Loeffler's serum* : The colonies, after 24 hours' incubation at 27°, are about 1 mm in diameter, circular, convex with a slightly raised centre, a smooth or finely granular surface and an entire edge; granular in structure when viewed by transmitted light, butyrous in consistency, pale or deeper cream in colour, moderately opaque and easily emulsifiable in water or saline. After 48 to 72 hours incubation the colony shows a varying degree of enlargement, the centre becomes more raised, more opaque and deepens in colour, while the periphery remains flat, extends outwards and appears more transparent than the centre, giving the so called "*Poached egg*" appearance.

On tellurite blood agar plate (specific characters of Mitis type of *C. diphtheriae*). Usually long, curved, pleomorphic rods, with prominent metachromatic granules. Except for some shadow areas, protoplasm stains evenly. Some strains show barring with or without granules. Occasional strains are coceoid and others yeast like.

C. diphtheriae is aerobic and facultative anaerobic. The optimum temperature for growth is in the near neighbourhood of 37°; with a range from about 5º to 40° over which growth occurs.

Heat resistance is slight, a temperature of 58° for 10 minutes sufficing to sterlise a suspension for broth culture.

Biochemical reactions : Ferments glucose, glactosc and maltose with the production of acid but no gas. It has no action on lactose, mannitol or as a rule, sucrose. Litmus milk is unchanged. Indole is not formed, but according to results obtained by Frieber (1921; *C. diphtheriae*) gives a colour reaction with *sulphuric acid* and *potassium nitrite* as a result of the formation of *indole acetic acid* from *tryptophase.* This substance does not, however, give the colour reaction with *paradimethylamido benzaldehyde* which is characteristic of indole itself. Nitrates are reduced catalose oxidose. Gelatin is not liquified. Urea is not hydrolysed.

The mitis type of *C. diphtheriae* gives irregular result with distrin and does not ferment starch or glycogen. The mitis type is usually haemolytic, the gravis type is non-haemolytic and intermedium type is consistently non-haemolytic.

Preparation : (a) Trituration 2x — Drug Strength 1/100

Membrane from Diphtheria	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparation below 6x should be stored at a temperature about 5° but should not be allowed to *freeze*.

Caution : Handle with care and allow aseptic condition upto 6x.

ELATERIUM
(Elet.)

Botanical name : *Echallium elaterium* A. Rich. **Family**: Cucurbitaceae

Synonym : *Momordica elaterium* Linn.

Common names : *English*: Squirting cucumber; *French*: Concombre sauvage; *German*: Springgurke.

Description : A perennial, rough, trailing vine known as squirting cucumber on account of its explosive fruits. Leaf entire to 3-1obed heart-shaped. Flowers yellow. Fruits oblong, prickly when mature separate from their stalks and dehisce at the slightest touch, squirting their seeds through the opening at the base.

Part used : Sediment from the juice of green mature fruit prepared by the method mentioned under Preparation.

Macroscopical : Thin, opaque, flat or slightly curved, rectangular pieces about 2 to 2.5 cm in both direction and 2 to 5 mm thick, pale green in colour when fresh becoming greyish on keeping. Fracture short and granular, exhibiting minute crystals. Odour slight; taste bitter and acrid.

Elaterium contains about 14 to 30 percent of Elaterin in the Maltese drug and about 20 to 27 percent in the English drug, about 5 to 12 percent of water, about 8 percent of inorganic matter, a small quantity of starch, fatty acids and phytosterol and sugar.

Distribution : Common in Southern Europe particularly in Malta and in the countries bordering on the Mediterranean. Cultivated in England.

History and authority : Proved and introduced by Mathews and Cooper; Allen: *Encyclop. Mat. Med*., Vol. IV, 200; Hering: *Guiding Symptoms*, Vol. V,198.

Preparation : The sediment is obtained as follow:
Fruits are collected green and mature, sliced and the juice pressed out. Upon standing for at least 2 hours the juice deposits a sediment which is separated by straining through cloth, dried and constitutes the matter known as Elaterium.

(a) Trituration	Drug Strength 1/10
Elaterium in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted into liquid 8x, H.P.I., Vol. I,

ERIGERON CANADENSE

(Erig. can.)

Botanical name : *Erigeron canadensis* Linn. **Family**: Compositae (Asteraceae)

Common names : *Sanskrit:* Palita; *English*: Canada fleabane; *French*: *Herb d' erigeron*; *German*: Berufkraut.

Description : An erect, much branched, annual, up to 1 m high; branches very slender. Leaves 2.5 to 7.6 cm, narrowly linear or linear lanceolate, acuminate, entire or remotely toothed. Heads: 0.4 to 0.6 mm in diameter, peduncled in elongate branched panicles; ligules pale-rose or purplish. Fruit an achene about 0.2 mm, narrow, flat, glabrous; pappus almost white, turning reddish.

Part used : Whole plant.

Macroscopical : Odour feeble; taste astringent, aromatic and bitter.

Distribution : Found in Western Himalayas, Punjab and upper Gangetic Plains up to an altitude of 1500 m plentiful in certain valleys in Kashmir, also found in Shillong and on Western Ghats and Nilgiris up to 2000 m.

History and authority : Proved by W. H. Burt; Allen: *Encyclop. Mat. Med*., Vol. IV, 211; Hering: *Guiding Symptoms*, Vol. V, 207; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 711.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Erigeron Canadense, moist magma containing solids 100 g, plant moisture 233 ml	333 g
Purified water	267 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

ERYNGIUM AQUATICUM

(Eryn. aq.)

Botanical name : *Eryngium aquaticum* Linn. **Family**: Umbelliferae (Apiaceae)

Synonyms : *Eryngium yucaefolium* Michx, *E. virginianum* Lam.

Common name : *English*: Button snake root.

Description : Stem erect, branched about 1 m tall. Leaves reticulately pinnately veined with a single mid vein, linear to oblong-lanceolate, the lower long petioled to sessile varying from entire to spinulose-toothed or even pinnatifid into a few linear segments. Bracts spreading or deflexed, mostly exceeding the heads, entire to spinose-serrate or pinnatifid. Heads ovoid to short-cylindric, 10 to 15 mm long; bractlets trifid near the summit and spinose-tipped.

Part used : Root.

Macroscopical : About 33 mm long with several ramifications ending at the base by deep scars. Very fine roots in the form of hairs; odour strong and aromatic.

Microscopical : Shows presence of several secreting canals at the level of the endoderm, medullary rays and pith. Xylem and phloem patches in the cortex separated by wide medullary rays. Large pith. Numerous aggregates of calcium oxalate. Endoderm very abundant and thick. No starch cells.

Distribution : Eastern United States to Florida and Louisiana.

History and authority : Proved by C. H. McClelland, *Am. Hom. Obs.* II, 180; Allen: *Encyclop. Mat. Med.*, Vol. IV, 213.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Eryngium Aquaticum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, three parts Purified Water and six part *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

EUPATORIUM PURPURIUM

(Eup. pur.)

Botanical name : *Eupatorium purpureum* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: Trumpet weed; *German*: Purpurrother Fasserhanf.

Description : Fibrous rooted, perennial, 60 cm to 2 m tall. Stem slightly glaucous, usually purple only at nodes, otherwise greenish. Leaves in 3's or 4's, lanceolate or ovate to elliptic, mostly 8 to 30 cm long and 2.5 to 15 cm wide, gradually or sometimes rather abruptly narrowed to the short petiole, pinnately veined, usually sharply or coarsely toothed loosely soft-pubescent to subglabrous beneath; usually minutely atomiferous and glandular as well. Inflorescence convex; involucre imbricate, 6.5 to 9 mm high, mostly 4 to 7 flowered; corolla generally very pale-pinkish or purplish, but variable, 4.5 to 7.5 mm long.

Part used : Root.

Macroscopical : Stump comparatively short, about 10 cm thick and knotty, it has several roots of about 1 mm diameter, of blackish appearance. Broken surface neat. Odour slight.

Microscopical : Shows typical dicotolydonous structure with xylem patches separated by multiseriate rays. Phloem patches with phloem fibres. Lacticiferous vessels in cortical parenchyma. Prisms of calcium oxalate rare. Presence of a pith.

Distribution : Indigenous to North America and common from Canada to Florida.

History and authority : Proved by Dresser, *Am. Hom. Obs.* I, 133; Allen: *Encyclop. Mat. Med.,* Vol. IV, 237.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Eupatorium Purpureum in *coarse powder*	100 g
Purified water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts of Purified Water and five parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

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FAGOPYRUM ESCULENTUM
(Fago. esc.)

Botanical name : *Fagopyrum esculentum* Moench. **Family**: Polygonaceae

Synonym : *Polygonum fagopyrum* Linn.

Common names : *Hindi*: Koti; *English*: Buckwheat; *French*: Blenoir.

Description : Herbaceous plant with a knotted stem, 20 to 60 cm tall, glabrous below, pubescent in lines above, round and hollow generally green, but sometimes tinged with red, lateral branches growing out of the joints which give off leave alternately from opposite side, heart-shaped or broadly triangular-hastate, the lower long petioled, the upper short petioled to subsessile. Flower in clusters usually crowded and compact; sepals elliptic, obtuse, 2 to 5 mm long. Flowers dimorphic, one with short styles and long stamens and the other with long styles and short stamens. Fruit achene smooth and shining, about 7 mm long with smooth entire angles much exceeding the sepals.

Part used : Whole Plant when mature.

Identification : (1) Juice extract of the plant gives green colour with few drops of *ferric chloride* solution.

(2) To 5ml alcohol soluble extract add several drops of concentrated *hydrochloric acid* and 50 mg of *magnesium powder*, the solution acquires a red colour.

(3) Extract on exposure gradually turns dark when kept for few hours in light.

Distribution : Cultivated in Khasia Hills, throughout the Himalayas and Western Tibet at elevation of 700 to 4000 m and in Nilgiris.

History and authority : Introduced by Hitchcock, Trans. *Am. Inst. Hom.*, 1873, 278; Allen: *Encyclop. Mat. Med.*, Vol. IV, 277; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 749.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Fagopyrum Esculantum, moist magma containing solids 100 g, plant moisture 233 ml	333 ml
Strong Alcohol	797 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water; seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Caution : Preparation below 3x are kept in well-closed container, protected from light.

FERRUM ARSENICICUM

(Fer. ars.)

Chemical formula : $Fe_3(AsO_4)_2$ **Mol. wt.**: 445.37

Common names : *English*: Ferrous arsenate; *French*: Proto Arseniate de fer; *German*: Arsenaures Eisen.

Description : Greenish amorphous powder, tasteless and odourless. Practically insoluble in *water*; soluble in mineral acid. It is obtained by precipitating a mixture of *sodium arsenate* and *ferrous sulphate* with *acidic sodium carbonate.*

Identification : It yields reactions characteristic of *Arsenic* and of *ferrous* salts.

Sulphate : 0.5 g complies with *limit test for sulphates*, H.P.I. Vol. I,

Assay : Dissolve about 2.5 g accurately weighed, in 10 ml of *dilute sulphuric acid* and 30 ml of recently boiled and cooled *water* and titrate with 0.1 N *potassium permangnate*. Each ml of 0.1 N *potassium permangnate* is equivalent to 0.01485 of $Fe_3(AsO_4)_2$.

History and authority : Introduced by Hale, *New Remed.* 2nd Ed.; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 753.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Arsenicicum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : A poison! Not be prescribed below 3x.

FERRUM IODATUM
(Fer. iod.)

Chemical formula : FeI_2 **Mol. wt.**: 309.68

Common names : *English*: Ferrum iodide; *French*: de fer; *German*: Jodeusen.

Description : Large, red violet crystals or black leaflets. Very hygroscopic. Soluble in *water, alcohol* and *ether.* It is obtained from metallic iron and *iodine*. In homoeopathy the salt used is saccharated *ferrous iodide*, which is prepared as follows:-

Iron, in the form of fine, bright wire and cut into small pieces:

Reduced iron	6 g
Iodine	1 g
Purified Water and dried Saccharum Lactis each in sufficient quantity	17 g

to make one hundred grammes.

Mix the iron wire, *iodine* and 20 ml of Purified Water in a flask, shake the mixture occasionally; wait till the smell of *iodine* is lost and the solution attains a green colour; filter into a porcelain capsule containing 40 g of Saccharum Lactis. Rinse the flask and iron wire with little *water* and filter it into capsule; evaporate on water bath with frequent stirring, until a dry mass remains; transfer it quickly to heated iron morter; reduce it to powder and triturate it with the reduced iron and sufficient quantity of Saccharum Lactis to make the powder one hundred grammes.

Identification : It yields the reactions characteristic of *ferrous salts* and of *iodine*.

History and authority : Proved and introduced by Muller, *AHY*. 50, 97; Allen: *Encyclop. Mat. Med*., Vol. IV, 324; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 761.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Iodatum	500 g
Saccharum Lactis	500 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

FERRUM MURIATICUM

(Fer. mur.)

Chemical formula : $FeCl_3.6H_2O$ **Mol. wt.**: 270.32

Common names : *English*: Ferric Chloride; *French*: Perchlorure de fer; *German*: Eisenchlorid.

Description : Brownish-yellow deliquescent hygroscopic masses, with a slight odour of *hydrochloric acid.* Readily soluble in *water, alcohol, ether, acetone.* Slightly soluble in *carbon disulphide*; practically insoluble in *ethyl acetate*. Contains not less than 98.0 percent of $FeCl_3.6H_2O$ with reference to the substance dried to constant weight.

Identification : Yields the reactions characteristic of *ferric salts,* H.P.I., Vol. I, and of *chlorides*, H.P.I., Vol. I,

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Free acid : Dissolve 2 g in 15 ml of *carbon-dioxide free water* and make up to 50 ml with the same *water*. Allow to stand for an hour. Filter and titrate 25 ml of the filtrate with 0.1 N *sodium hydroxide* using *phenolphthalein* as indicator. Not more than 1.4 ml of 0.1 N *sodium hydroxide* is required to neutralise.

Free chlorine : Boil 5 g with 10 ml of *water* and expose *starch iodide* paper to the vapours. No blue colour is produce on the paper.

Phosphate : Boil 2 g with a mixture of 2 ml of *nitric acid* and 2 ml of *water*, cool, add 20 ml of *water* and 10 ml of *ammonium nitromolybdate solution* and maintain at 40° for 2 hours. No yellow precipitate is formed.

Sulphate : Dissolve 2 g in 50 ml of 1 N *hydrochloric acid* and apply the *sulphate* test, H.P.I., Vol. I,

Ferrous iron : Dissolve 4 g in 100 ml of *water*, add 4 ml of *orthophosphoric acid* and titrate with 0.1 N *potassium permanganate* from a microburette. Carry out a blank determination omitting the *ferric chloride*. The difference between the two titrations does not exceed 0.1 ml.

Lead : Not more than 15 parts per million, H.P.I., Vol. I,

Copper and zinc : Dissolve 12.5 g in a mixture of 10 ml of *hydrochloric acid* and 10 ml of *water* and 5 ml of *nitric acid* and boil gently for 5 minutes, cool. Extract with four successive quantities each of 20 ml of *solvent ether*. Discard *ethereal* layer, evaporate the acid layer to dryness dissolve the residue in 10 ml of 1 N *hydrochloric acid*.

Copper : To 1 ml of the solution, add 25 ml of *water* and 1 g of *copper free-citric acid* make alkaline with dilute solution of *ammonia*, dilute to 50 ml with *water*, add 1 ml of solution of *sodium diethyl dithiocarbamate*, allow to stand for 5 minutes. The colour produced is not deeper than that produced by similarly treating a mixture of 6 ml of *copper sulphate* and 1 ml of 1 N *hydrochloric acid*.

Zinc : To 0.5 ml of the solution add 15 ml of 1 N *sodium hydroxide*, boil and filter; wash the residue with *water* and dilute the combined filtrate and washings to 25 ml with *water*. To 5 ml, add 5 ml of 1 N *hydrochloric acid* and 2 g of *ammonium chloride*, dilute to 50 ml with *water*, add 1 ml of *potassium ferrocyanide solution* and allow to stand for 5 minutes. The turbidity produced is not greater than that produced in a solution prepared simultaneously by adding 1 ml of *potassium ferrocyanide solution* to a solution prepared from 5 ml of *dilute zinc sulphate solution*. 3 ml of N *sodium hydroxide*, 6 ml of N *hydrochloric acid*, 2 g of *ammonium chloride* and sufficient *water* to produce 50 ml.

Assay : Dissolve about 5 g accurately weighed in sufficient *water* to produce 100 ml. To 20 ml of this solution, add 4 ml of *water*, 6 ml of *dilute hydrochloric acid* and 3 g of *potassium iodide* and set aside for 5 minutes out of direct sunlight. Titrate the liberated iodine with 0.1 N *sodium thiosulphate* using *starch* solution as indicator. Carry out a blank determination omitting the sample and adding 40 ml of *water* just before the end point and substract the result from that obtained with the sample. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.02703 g of $FeCl_3.6H_2O$.

History and authority : Proved and introduced by Rabutean, Drumond and James Murray; Allen: *Encyclop. Mat. Med*., Vol. IV, 328; Hering: *Guiding Symptoms*, Vol. V, 307.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ferrum Muriaticum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

FRAXINUS AMERICANA
(Frax. am.)

Botanical name : *Fraxinus americana* Linn. **Family**: Oleaceae

Synonyms : *F. novae-angliae* Mill., *F. alba* Marsh.

Common name : *English*: White ash.

Description : Tall tree, up to 40 m in height, branchlet and petiole glabrous. Leaflets 5 to 9, usually 7 oblong to ovate or obovate, usually abruptly acuminate entire or serrulate towards the summit rounded to broadly acute at base, paler beneath, 7.6 to 12.7 cm. Fruit 3 to 5 m long, obtuse or retuse at the summit, the wing extending about a third of the length of terete body, free portion above the apex of the body, longer than the body itself subtending calyx 1 to 1.3 rarely 2 mm long, seldom cleft on one side only.

Part used : Inner bark.

Macroscopical : The drug appears in the form of long curved fragments, 1 to 2 mm thick. Bark curved, greyish outside and reddish from inner side. Middle whitish-green bark, contains chlorophyll. The outer part smooth very finely striated, with fine whitish lenticels. The inner part also smooth. The inner bark contains only rare fragments of grey external part. Fragments are 1 mm in thickness, whitish and reddish. Taste slightly bitter.

Microscopical : Cork thick, cells polyhedral, more or less collenchymatous. Rings of sclerenchyma cells in irregular clusters adjoining to clusters of fibres in the pericyclic region. The sclerenchyma cells with large lumen; the pericyclic fibres round with narrow lumen. The phloem separated by multicellular biseriate phloem rays. Crystals and starch absent. Cork cells absent from inner bark.

Distribution : Eastern North America to Florida and Texas.

History and authority : Introduced and proved by J. S. Wright, *U. S., Med. Investigator, N. S. V*., 2, 1875, 326; Allen: *Encyclop. Mat. Med*., Vol. IV, 368; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 791.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Fraxinus Americana in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	683 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

GNAPHALIUM POLYCEPHALUM

(Gnap. p.)

Botanical name : *Gnaphalium polycephalum* Michx.

Family: Compositae (Asteraceae)

Synonym : *Gnaphalium obtusifolium* Linn.

Common names : *English*: Everlasting; *French*: Immortelle; *German*: Immerschon.

Description : Annual or sometimes biennial, fragrant, up to 75 cm in height, erect. Stem thinly white-woolly, commonly becoming subglabrous or sometimes a little glandular towards the base. Leaves numerous, linear-lanceolate, up to about 10 cm long and 1 cm wide, obtuse to acuminate, sessile, white woolly beneath, green and from glabrous to slightly glandular or slightly woolly above. Inflorescence branched and many-headed except in depauperate plants, flat or round-topped and often elongate, the final clusters with the heads somewhat dingy, campanulate, woolly only near the base, about 5 to 7 mm high. Pappus bristles distinct, falling separately. Fruit achenes glabrous.

Part used : Whole plant.

Identification : (1) To about 5 ml of 70 percent alcoholic extract representing about 10 percent of the drug add a small quantity of *sodium nitrate* and 1 ml of *hydrochloric acid*, mix slowly. Transfer this gradually to a test tube containing pre-mixed 3 ml *sodium hydroxide* solution with a small quantity of *resorcinol;* a red colour is obtained.

(2) To 5 ml of 70 percent alcoholic extract of the same strength on addition of 2 ml dilute *hydrochloric acid* and *Dragandroff's* reagent gives brick-red precipitate.

(3) 5 ml of 70 percent alcoholic extract of the same strength on addition with 2 ml dilute *hydrochloric acid* and *platinic chloride* solution gives yellow precipitate.

Distribution : North America.

History and authority : Introduced and proved by Banks, *N. Am. J. of Hom.* 7, 383 in 1858; Allen: *Encyclop. Mat. Med*., Vol. IV, 456; Hering: *Guiding Symptoms*, Vol. V, 433.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Gnaphalium Polycephalum in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

GUAREA TRICHILOIDES

(Gua. tri.)

Botanical name : *Guarea trichiloides* L. **Family**: Meliaceae

Common name : *English:* Ash leaved guarea.

Description : An evergreen tree, up to 5 m in height, having a strong musk like odour. Leaves large pinnate, short-petioled, tumid and inflated. Flowers white inconspicuous; in axillary cluster.

Part used : Bark.

Microscopical : Phellum, 20 to 25 cells wide enclosing at places brachysclereids in patches; phellogen of 1 to 2 layers; a fairly wide zone of secondary cortical parenchyma containing scattered brachysclereids scattered or in patches, a few thick-walled tapering sclerenchyma fibres and numerous scattered large brown dots of colouring matters; a wide zone of secondary phloem containing phloem parenchyama, seive tubes, phloem-ray cells, branchysclereid in patches or in short bands, sometime in association on both sides with crystal fibres and sclerenchymatous fibres, numerous scattered thick-walled narrow lumen sclerenchyma fibres in association with crystal fibres and numerous scattered large brown dots of colouring matter.

Identification : Evaporate 20 ml, 50 percent alcoholic extract of drug on water-bath to remove alcohol. Extract the remaining solution with 20 ml *chloroform* and separate the two layers.

(1) Carry out TLC of *chloroform* layer on silica gel 'G' plate using benzene : *methanol* (9 : 1 v/v) as mobile phase and *antimony trichloride* as spray reagent. Under UV light before spraying six spots appear at R_f 0.30, 0.52, 0.70, 0.83 and 0.97 (all blue fluorescence) and at R_f 0.40 (yellowish fluorescence). While on spraying with *antimony trichloride* six spots appear at R_f 0.17, 0.30, 0.40, 0.50 (all purplish-violet), 0.60 (yellowish-red) and 0.70 (blue).

(2) Carry out TLC of aqueous extract on *silica gel* 'G' plate using *chloroform* : *methanol* (2 : 3 v/v) as mobile phase. After spraying the plate with *aniline phthalate* as spray reagent. On spraying followed by heating three spots appear at R_f 0.20 (brown), 0.30 (brown), 0.94 (yellow).

History and authority : Introduced and proved by Petroz *Journ. de la Soc.* Gall. 1st Ser., Vol. V, 9; Allen: *Encyclop. Mat. Med*., Vol. IV, 512; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 856.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Guarea Trichiloides in moderately *coarse powder* 100 g

Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

IBERIS AMARA

(Iber. am)

Botanical name : *Iberis amara* Linn. **Family**: Cruciferae (Brassicaceae)

Synonym : *Iberis coronaria* Hort.

Common names : *Hindi*: Chandani; *English*: Common Garden Candy tuft; *German*: Bauernserf.

Description : An annual, about 30 cm high. Leaves alternate, oblanceolate to spathulate 2.5 to 10 cm long, distantly pinnatified or toothed sometimes entire. Flowers in corymbs, later elongating into racemes, white or mauve with two outer petals larger than others. Fruit a small suborbicular silique; seeds slightly winged and oval.

Part used : Seed.

Macroscopical : The seed is 2 to 3 mm long and 1 to 2 mm wide, somewhat reddish in colour bordered by a more or less salient membrane provided with oily cotyledons. Taste very bitter.

Microscopical : Testa of single layer of epidermis with tangentially elongated thin-walled cells, a layer of large palisade like subepidermal cells; tegmen of single layer of tangentially elongated parenchymatous cells generally double the breadth of subepidermal cells; single layered endosperm of thick-walled parenchymatous cells. Radicle composed of oval and isodiametric cells while cotyledons of palisade and oval storage cells.

Distribution : Cultivated in Indian gardens and other parts of the world.

History and authority : Introduced by Hale and proved by R. C. Sabin and Dodge under supervision of Hale; Allen: *Encyclop. Mat. Med.*, Vol. V, 60; Hering: *Guiding Symptoms*, Vol. VI**,** 131.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Iberis Amara, moist magma containing solids 100 g and plant moisture 100 ml	200 g
Purified Water	300 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

INDIUM METALLICUM
(Ind. met.)

Chemical formula : In **Mol. wt.**: 114.76

Description : Silvery-white, lustrous, malleable and ductile metal. Soluble in dilute mineral acids; insoluble in *water*. Contains not less than 99.0 percent of *Indium* with reference to the substance dried to constant weight at 105°. It marks on paper.

Identification : (1) Dissolve 50 mg in *dilute nitric acid* by boiling. The solution on addition of strong *ammonia solution* yields a white precipitate.

(2) To the solution in *dilute hydrochloric acid*, add *glacial acetic acid* and *sodium acetate* in equal parts, add 8 *hydroxyquinoline solution*, the precipitate is produced.

(3) Add one drop of the solution in *dilute hydrochloric acid* on a filter paper impregnated with *saturated solution* of *alizarin* and dry. On exposing over *strong ammonia vapours* and then dipping in a *saturated aqueous boric acid solution*, the spot turns red.

(4) When strongly heated in air, burns with bluish-violet flame and brownish fumes.

Melting point : 155°.

Assay : Dissolve about 0.2 g, accurately weighted, in *dilute hydrochloric acid.* Add 10 ml *potassium cyanide solution*. Make the solution just alkaline with 0.1 N *sodium-hydroxide* and 15 ml of *strong* a*mmonia-ammonium chloride buffer solution.* Titrate with 0.1 M *EDTA solution*, using *mordant black solution* as indicator. Each ml of 0.1 M EDTA is equivalent to 0.01148 g of In.

History and authority : Proved and introduced by Bell and C. Mohr; Allen: *Encyclop. Mat. Med.*, Vol. V, 107; Hering: *Guiding Symptoms*, Vol. VI**,** 188.

Preparation : (a) Trituration 1x — Drug strength 1/10

Indium Metallicum in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, 9x and higher with *Dispensing Alcohol.*

IRIDIUM METALLICUM

(Ir. met.)

Chemical formula : Ir **Mol. wt.**: 193.10

Description : Silvery-white, very hard metal. Insoluble in acids, in mixture of acids, even in *aqua regia*. The metal becomes soluble on being fused with *potassium hydroxide* and *potassium nitrate*. Contains not less than 98.0 percent of Ir with reference to the substance dried to constant weight at 105°.

Solution : Fuse 0.4 g with 0.2 g of *potassium hydroxide* and 0.2 g of *potassium nitrate*. Dissolve the residue in *aqua-regia*. Dilute the solution to 300 ml with *water*.

Identification : (1) To 3 ml of solution, add 2 to 3 drops of 1 percent *leucomalachite green* solution in 2 M *acetic acid* and *chloroform* and shake. Green colour is produced in *chloroform* layer.

(2) Mix a drop of the solution with a drop of *nitric acid* in a micro crucible and evaporate. Add two drops of *hydrochloric acid* and again evaporate. Dissolve the residue in one drop of *water* and one drop of *benzidine acetate*. A blue colour is produced.

(3) Mix the solution with powdered *copper* and 2 drops of 5 percent *hydrochloric acid*, boil and filter or centrifuge if necessary. To the filtrate or centrifuge add 1 drop of *nitric acid* and evaporate. Add a drop of *hydrochloric acid* and evaporate. Repeat the evaporation after adding a drop of *hydrochloric acid*. To the residue and one drop of *water* and one drop of *aqueous-ethanolic solution* of *p*. *nitroso-dimethyl-aniline.* A red colour is produced.

Assay : To 150 ml of the solution add 0.1 g of *potassium bromate* and boil. Make just neutral with *sodium bicarbonate* to *bromocresol purple solution* (pH-6). Filter through an ashless filter paper and wash the residue with 1 percent *ammonium sulphate solution.* Ignite the filter paper in a weighed silica crucible and heat at 675° in hydrogen atmosphere and weigh as Ir.

History and authority : Proved and introduced by Hering: *Guiding symptoms,* Vol. VI**,** 264; Clarke: A *Dictionary of Practical Mat. Med.* Vol. II, 44.

Preparation : (a) Trituration 1x — Drug strength 1/10

Iridium Metallicum in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : The drug is non-radioactive and should not be mistaken for radio-active material (Iridium) whose atomic wt. is 192. In order to make sure of the non-radioactive material an appropriate photographic method for testing may be employed.

JATROPHA CURCAS

(Jat. curc.)

Botanical name : *Jatropha curcas* L. **Family**: Euphorbiaceae

Common names : *Hindi*: Safed arand; *English*: Purging Nut; *French*: Pignon d'Inde; *German*: Schwarze Breohnuss.

Description : A large shrub or a small tree, up to 5 m in height. Leaf alternate, crowded at the top of branches, broadly ovate, cordate, acute, usually 3 to 5 lobed, glabrous, 15 to 45 cm including petiole. Flowers in loose panicles of cymes, yellowish-green, 7 mm across. Fruit fleshy about 2.5 cm long, ovoid, black, breaking into three 2-valved cocci, containing three seeds in distinct cells; seeds ovoid-oblong, dull brownish-black.

Part used : Seed.

Macroscopical : Seeds blackish with small white patches, oblong-ovoid, nearly up to 2.5 cm long, convex on one side and flat on the other, a whitish hilum at one end, surface rugose. Within the testa is the kernel having somewhat sweet taste followed by an acrid burning sensation.

Microscopical : Powder: the isodiametric and polygonal parenchyma cells with oil globules and aleurane grains, palisade sclerenchyma cells of outer part of seed coat brown and narrow lumened, sclerenchyma cells of inner part of seed coat elongated and narrow lumened. Thin membrane of ill defined cellular structure having tracheary elements with spiral and reticulate thickenings and laticiferous ducts.

Distribution : Throughout India.

History and authority : Proved and introduced by C. Hering: *Guiding Symptoms*, Vol. VI**,** 298; Allen: *Encyclop. Mat. Med.*, Vol. V**,** 182.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Jatropha Curcas in *moderately coarse powder* 100 g

Strong Alcohol in sufficient quantity.

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 1x Drug strength 1/10

Jatropha Curcas 100 g

Saccharum Lactis in *coarse powder* 900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

JUGULANS CINEREA

(Jug. cin.)

Botanical name : *Juglans cinerea* Linn. **Family**: Juglandaceae

Common names : *English*: Butternut; *French*: Ecorce de Noyerm; *German*: Graue Wallnussrinde.

Description : A large tree, occasionally up to 32 m tall with grey bark; young branchlets villous and glandular. Leaflets 11 to 19, oblong-lanceolate, acuminate, appressed-serrate, usually pubescent on both sides more densely below, 7.5 to 12.5 cm long. Flowers in short racemes, 2 to 6, oblong, pointed, 7.5 to 12.5 cm long; nut oblong, with 4 more and 4 less prominent irregular ribs and many broken sharp ridges between.

Part used : Inner bark of root and branches.

Macroscopical : Root-bark occurs in quills, curved pieces or in chips of variable length and up to 10 mm thick, deep brown in colour. The outer surface smooth or warty, the inner surface, smooth and striate, with stringy fibres adhering. Fracture short and fibrous. Odour faintly aromatic; taste bitter, astringent and acrid. Stem-bark has on the surface an ashy and very wrinkled appearance, the lower surface smooth, 3 to 5 mm thick. Odourless; taste slightly bitter.

Microscopical : Stem-bark reveals a thick cork, a phelloderm with round cells, containing numerous aggregates of calcium oxalate. Pericyclic sheath discontinuous with fibres. Phloem patches not thick, separated by bi or triseriate medullary rays. Phloem tissue also contains aggregates of calcium oxalate. Amyliferous cells in the phelloderm.

Distribution : Eastern United States from new Brunswick and Quebec to Georgia, West to Minnesota, Kansas and Arkansas.

History and authority : Proved and introduced by Paine, *Hale's New Rem 2nd Edition* 621; Allen: *Encyclop. Mat. Med.,* Vol. V**,** 193, Vol. X, 554.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Juglans cinerea in *coarse powder*	100 g
Purified Water	250 ml
Strong Alcohol	780 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture; two parts of Purified Water, seven parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

JUGLANS REGIA
(Jug. reg.)

Botanical name : *Juglans regia* Linn. **Family**: Juglandaceae

Common names : *Hindi*: Akrot; *English*: Nux Juglans, walnut; *French*: Noix Commune.

Description : A large, deciduous, monoecious tree, with tomentose shoots; bark grey, longitudinally fissured. Leaves alternate, imparipinnate, 15.0 to 37.5 cm long; leaflets 12.3 to 32.5 cm, subsessile, elliptic to oblong lanceolate, 7.5 to 20 cm x 3.5 to 10 cm, usually entire. Flowers small, yellowish-green, male in pendulous slender catkins, 5.0 to 12.5 cm long, female in 1 to 4 flowered terminal catkins. Fruit a green drupe, 2-valved enclosing oily edible seed.

Part used : Leaf and green unripe fruit.

Microscopical : (a) Leaf: epidermis single-layered with stomata on lower surface only; trichomes of three types (a) elongated unicellular lignified in tufts (b) capitates glandular with club-shaped head and 2 to 3 celled stalk each cell containing brown cytoplasm (c) peltate glandular with unicellular stalk; mesophyll with palisade in 2 rows and spongy parenchyma. Midrib with a single layered epidermis, collenchyma of 10 to 12 layers; a stele consisting of an interrupted ring of 2 to 3 layers of sclerenchymatous pericycle, a wide phloem and an interrupted ring of xylem. Accessory bundles present adaxially in the midrib. Medulla of oval parenchyma cells. Scattered rossette crystals of calcium oxalate.

(b) Fruits: In transection, epicarp bearing single layer of epidermal cells, covered with trichomes of two types; (a) capitates with 3 to 4 celled stalk, each cell possessing brown cytoplasm and a globular head, (b) peltate with 1 to 2 celled uniseriate stalk; 3 to 5 layers of elongated oval parenchyma cells; a zone of 3 to 4 layers of brachy sclereids; a wide zone of oval, isodiametric parenchyma cells, scattered through which are found vascular elements and several lignified scleroidal cells containing pits. Each vascular bundle consists of wide phloem and xylem. Endocarp consists of a dense wide zone of brachy sclereids and a zone of lacunar parenchyma cells with scattered sclereids. Perisperm, the cells containing thin papery covering kernel, consists of an outer layer of palisade oil droplets followed by a zone of parenchyma bearing vascular elements. Endosperm consists of a single layered dermis and radially elongated parenchyma cells containing oil globules.

Distribution : India at 1200 m to 3000 m in Himalayas.

History and authority : Introduced and proved by Muller in 1845, *Hygea* XXII, 70; Allen: *Encyclop. Mat. Med.*, Vol. V, 197; Clarke: *A Dictionary of Practical Mat. Med*. Vol. II, 74.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Juglans Regia in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	470 ml

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x to contain one part Mother Tincture, five parts Purified Water, four parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

KALI ACETICUM

(Kali. ace.)

Chemical formula : CH_3COOK **Mol. wt.**: 98.14

Common names : *English*: Potassium acetate; *French*: Ace'tate de; *German*: Kalium acetat.

Description : White powder or granules or white crystals; odourless or having a faint odour, taste saline and slightly alkaline. It is very deliquescent. Freely soluble in *water* and in *alcohol.* Contains not less than 99.0 percent of $C_2H_3O_3K$ calculated with reference to the substance dried at 105° to constant weight.

Identification : Yields the reactions characteristic of *potassium* H.P.I., Vol. I, and of *acetates* H.P.I., Vol. I,

Reaction : 1 g dissolved in *carbon di-oxide free water* requires not more than 0.5 ml of 0.1 N *sulphuric acid* to reduce a solution which is acid to *solution of phenolphthlein*.

Aluminium and calcium : Dissolve 0.5 g in 25 ml of *water* and warm with 1 ml of *dilute ammonia solution* and 1 ml *ammonium oxalate solution*; no precipitate or turbidity is produced.

Arsenic : Not more than 4 *parts per million*, H.P.I., Vol. I,

Heavy metals : Dissolve 1 g in 10 ml of *water* add 3.5 ml of *dilute hydrochloric acid* and dilute to 25 ml with *water;* heavy metals are not more than 20 *parts per million*, H.P.I., Vol. I,

Sodium : Dissolve 0.3 g in 4.5 ml of *water*, add 10 ml of *alcohol* and 30 ml of *potassium antimonite solution* and allow standing; no sediment or white crystalline precipitate is visible to the naked eye within 15 minutes.

Chloride : 0.5 g compiles with the *limit test for chlorides*, H.P.I., Vol. I,

Sulphate : 0.5 g compiles with the *limit test for Sulphate*, H.P.I., Vol. I,

Loss on drying : Loses not more than 5 percent of its weight when dried to constant weight at 105°.

Assay : Weigh accurately about 2 g, heat until carbonised, cool, add 50 ml of *water* and 50 ml of 0.5 N *sulphuric acid* and boil; filter, wash the filter paper in *water*, combine the filtrate washings and titrate the excess of the acid with 0.5 N *sodium hydroxide* using *methyl orange solution* as indicator. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.04907 g of $C_2H_3O_2K$.

History and authority : Proved by Vest; Allen: *Enclyclop. Mat. Med.* Vol. V, 210.

Preparation : (a) Mother Solution ϕ — Drug Strength 1/10

Kali Aceticum — 100 g

Purified water in sufficient quantity

to make one thousand millilitres of the mother solution.

(b) Potencies: 2x and 3x with Purified Water; 4x and 5x with Dilute Alcohol; 6x and above with *Dispensing alcohol*.

Caution : Preparations below 3x to be freshly prepared.

KALI PICRICUM
(Kali pic.)

Chemical formula : $C_6H_2KN_3O_7$ **Mol. wt.**: 267.20

Common names : *English*: Potassium picrate.

Description : Yellow, greenish-yellow, lustrous needles, explodes when heated or struck. Freely soluble in boiling *water*.

Identification : (a) Dissolve about 0.5 g of the drug in 10 ml of hot *water* and add 2 ml of *perchloric acid* (60 percent w/w); a white crystalline precipitate is formed.

(b) Dissolve 1 gm of the drug in 15 ml of *water* and add a few drops of *hydrochloric acid* to acidify the solution, filter if necessary, shake with 50 ml of solvent *ether* in a separating funnel, separate the ethereal layer and wash with *water*, dry the ether layer over *anhydrous sodium sulphate*, evaporate to dryness at 105°, the melting point of the powder so obtained should be between 121° and 123°.

(c) Dissolve the powder obtained under identification test (b) in *alcohol*, the solution dyes leather or wool yellow.

Assay : Dissolve 0.1 g in 20 ml of 1 N *hydrochloric acid* and then extract (thrice) with 30 ml each quantity of solvent *ether;* collect the ethereal portion and discard any aqueous portion and dry the ethereal layer over *anhydrous sodium sulphate*, evaporate and dry. Dissolve the mass so obtained with 10 ml of *alcohol* (previously neutralised) with 0.01 N using *phenolphthalein* indicator and titrate with 0.05 N *sodium hydroxide*. Each ml of 0.05 N *sodium hydroxide* is equivalent to 0.01336 g of $C_6H_2KN_3O_7$.

History and authority : Introduced by Wolf and Gouzee, *Zeat, Hom. KL.,* I 7; Allen: *Encyclop. Mat. Med.,* Vol. V, 386; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 158.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Picricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : An explosive salt, to be prepared with care to avoid explosion. Poisonous! not to be dispensed below 3x.

KALI FERROCYANATUM
(Kali. fer.)

Chemical formula : $K_4Fe(CN)_6.3H_2O$ **Mol. wt.**: 422.35

Common names : *English*: Potassium ferrocyanide; *French*: Ferrocyanure de potassium; *German*: Ferrocyankalium.

Description : Yellow crystalline powder; soluble in *water*, insoluble in *alcohol.* Contains not less than 99.0 percent of $K_4Fe(CN)_6$ calculated with reference to the substance dried at 105° to a constant weight.

Identification : (i) Yields the *reactions* characteristic of *potassium*, H.P.I., Vol. I,

(ii) 5.0 percent solution when treated with *ferrous sulphate solution* yields of a white precipitate which rapidly becomes blue which is insoluble in *dilute hydrochloric acid.*

Reaction : A 10 percent solution is neutral to *litmus paper.*

Arsenic : Not more than 4 parts per million, H.P.I., Vol. I,

Heavy metals : Dissolve 1g in 10 ml of *water*, add 3.5 ml of *dilute hydrochloric acid* and apply *limit test for heavy metals*, H.P.I., Vol. I, Heavy metals not more than 20 parts per million.

Chloride : 0.5 g complies with *limit test for chlorides*, H.P.I., Vol. I,

Sulphate : 0.5 g complies with *limit test* for *sulphates*, H.P.I., Vol. I,

Loss on drying : Loses not more than 12.8 percent of its weight when dried to constant weight at 105°.

Assay : Dissolve about 1.0 g accurately weighed in 200 ml of *water*, add 10 ml of *sulphuric acid* and titrate with 0.1 N *potassium permanganate solution.* Each ml of 0.1 N *potassium permanganate* is equivalent to 0.04224 g of $K_4Fe(CN)_6.3H_2O$.

History and authority : First proved and introduced by James and Bell; Allen: *Encyclop. Mat. Med.*, Vol. V**,** 330; Hering: *Guiding Symptoms*, Vol. VI, 423.

Preparation : (a) Trituration 2x — Drug strength 1/100

Kali Ferrocyanatum	10 g
Saccharaum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

KALI NITRICUM

(Kali. Nit.)

Chemical formula : KNO_3 **Mol. wt.**: 101.1

Common names : *English*: Potassium nitrate; *French*: Azotate de potasse; *German*: Kaliumnitrat.

Description : Colourless crystals or a white crystalline powder; odourless; taste, cool and saline. Freely soluble in *water* and very sparingly soluble in *alcohol.* Contains not less than 99.0 percent of KNO_3 calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields *reactions* characteristic of *potassium* H.P.I., Vol. I, and of *nitrates,* H.P.I., Vol. I,

Arsenic : Note more than 2 parts per million, H.P.I., Vol. I,

Lead : Not more than 10 parts per million, H.P.I., Vol. I,

Sodium : Dissolve 1.0 g in 10 ml of *water,* acidify with *dilute acetic acid.* On addition of 5 ml of *magnesium uranvl acetate solution,* no precipitate or turbidity is formed.

Ammonium compounds : Warm 1.0 g with 10 ml of *sodium hydroxide solution,* no odour of *ammonia* is produced.

Chloride : 1.0 g compiles with the *limit test for chlorides,* H.P.I., Vol. I,

Sulphate : 0.50 g compiles with the *limit test for sulphates,* H.P.I., Vol. I,

Assay : Dissolve about 0.3 g accurately weighed in 300 ml of *water* in an ammonia distillation apparatus, add 3 g of *Devarda's alloy* and 10 ml of *sodium hydroxide solution* and distil. Collect the distillate in 50 ml of 0.1 N *hydrochloric acid* and titrate the excess of acid with 0.1 N *sodium hydroxide,* using *methyl red solution* as indicator. Repeat the operation without potassium nitrate. The difference between the titrations represents the acid required to neutralise ammonia formed from the potassium nitrate. Each ml of 0.1 N *hydrochloric acid* is equivalent to 0.01011 g of KNO_3.

History and authority : Proved and introduced by Hahnemann and Hecker: *Chronic Diesase* 1221; Allen: *Encyclop. Mat. Med.,* Vol. V, 355; Hering: *Guiding Symptoms,* Vol. VI**,** 459.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

KALMIA LATIFOLIA

(Kalm. lat.)

Botanical name : *Kalmia latifolia* Linn. **Family**: Ericaceae

Common names : *English*: Broad-Leaved laurel; *French* and *German*: Kalmie.

Description : Shrub or a small tree, usually up to 3 m but sometimes up to 10 m tall, often forming dense thickets. Leaves all or mostly alternate, coriaceous, elliptic or lance-elliptic, 5 to 8 cm long, usually acute at both ends, glabrous, petioles 1 to 2 cm long. Flowers numerous in terminal corymbs, on pedicels 1 to 4 cm long; sepals lance-oblong, about 3 mm long, not imbricate; corolla white to rose with purple markings, 2 to 2.5 cm wide. Capsule depressed globose, 6 to 8 mm in diameter.

Part used : Leaf.

Macroscopical : Coriaceous, elliptical, lanceolate, petiolate with full limb, venation pinnate and glabrous with bright upper face, 3 to 10 cm long; odourless; taste bitter.

Microscopical : Mesophyll differentiated into palisade and spongy parenchyma. Palisade of 3 layers; upper epidermis possesses paracytic stomata; lower epidermis provided with short unicellular hairs towards the midrib region; midrib has a central bundle in the form of arc with xylem below and phloem on the upper side surrounded by discontinuous fibrous pericycle; above the rib there is collenchymas, aggregates of calcium oxalate present throughout.

Distributions : Eastern North America.

History and authority : Proved and introduced by Hering: *Trans. Am. Inst. Hom.* (1845) 154; Allen: *Encyclop. Mat., Med.* Vol. V, 388.

Preparation : (a) Mother Tincture ϕ

	Drug Strength 1/10
Kalmia Latifolia in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, three parts of Purified Water and six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LAC VACCINUM
(Lac. vac.)

Common name : Cow's milk.

Description : Milk should be collected hygienically from a healthy cow. Milk consist of an emulsion of butter fat in a continuous aqueous phase in which are lactose and a colloidal suspension of casein, stablised mostly by albumin and globulin. It contains 4 to 5 percent lactose, 3 to 4 percent protein, 3 to 5 percent fat, 0 to 12 percent *calcium* and has specific gravity about 1.032.

Reaction : pH 6.5.

Total solid : Not less than 8.5 percent.

Method : Take about 100 g accurately weighed and place in tarred dish. Heat on a water-bath until the residue is apparently dry. Transfer to an oven and dry to constant weight at 105° then wash it with hot *petroleum ether* to remove fat. Washing should be continued till complete removal of fat. Then dry and weigh. Fat should be determined by the difference in weight of total solid before and after fat removal.

Total ash : Not less than 0.70 percent.

Total fat : Not less than 3 percent.

Total acidity : Not more than 0.014 percent.

Method : Take about 20 g, accurately weighed into a suitable dish and dilute with twice its volume of *carbon dioxide-free water*. Add 1 ml of *phenolphthalein solution* and titrate with 0.1 N *sodium hydroxide* to the purplish-pink colour. Each ml of 0.1 N *sodium hydroxide* is equivalent to 0.009 g of *lactic acid.*

Identification : It gives reactions characteristics of *calcium* H.P.I., Vol. I, and *phosphates,* H.P.I., Vol. I,

Cascin : Take 1 ml of drug and add few drops of 0.1 percent *copper sulphate solution* and 0.5 ml of 1 percent *sodium hydroxide* solution. A violet colour develops.

History and authority : Proved and introduced by J.C. Boardman; Allen: *Mat. Med. of the Nosodes,* 128; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 202.

Preparation : (a) Mother Solution ϕ — Drug strength 1/10

Lac Vaccinum	100 ml

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x and 3x with Purified Water; 4x and higher with *Dispensing Alcohol*.

Caution : Preparations below 3x to be freshly prepared.

LAC VACCINUM DEFLORATUM
(LAC DEFLORATUM)

(Lac. def.)

Description : Skimmed milk is defatted Cow's milk, milky white in colour, almost tasteless and odourless.

Specific gravity : About 1.040.

Fat : Not more than 0.5 percent.

Solid nonfat : 8.5 to 9.0 percent.

History and authority : Allen: *Mat. Med. of Nosodes,* 89; Boericke: *Mat. Med. and Repertory*, 9th Ed., 387.

Preparation : (a) Trituration 2x — Drug strength 1/100

Lac Defloratum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

LACHNANTHES TINCTORIA

(Lach. tin.)

Botanical name : *Lachnanthes tinctoria* Ell. **Family**: Haemodoraceae

Common name : *English*: Spirit weed.

Description : A perennial, deciduous herb, with deep orangish-red fibrous, cylindrical and more or less horizontal ligneous rhizome. Stems stout, erect 30 to 80 cm tall, nearly glabrous below, becoming tomentose above. Leaves erect, 3 to 10 mm wide, the lower up to 40 cm long, the cauline smaller or bract like. Inflorescence dense, flat or rounded, 3 to 8 cm wide, densely wooly. Flowers 10 to 12 cm long, dingy yellow, densely tomentose; sepals lance-subulate, about two thirds as long as the linear-oblong petals; stamens 3, ovary wholly inferior. Seeds reddish-brown, 2 to 3 mm in diameter. Odourless; taste bitter, exude red liquid.

Part used : Whole plant.

Distribution : Eastern North America.

History and authority : Proved and introduced in 1864 by Lippe, *Am. Hom. Rev.* 4, 458; Allen: *Encyclop Mat. Med.,* Vol. V, 471; Hering: *Guiding Symptoms*, Vol. VII, 1.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Lachnanthes Tinctoria *in coarse powder*	100 g
Purified Water	400 g
Strong Alcohol	635 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water; and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LATHYRUS SATIVUS
(Lat. sat.)

Botanical name : *Lathyrus sativus* Linn. **Family**: Leguminesae

Common names : *Hindi*: Khesari; *English*: Chick pen; *German*: Weisse deutsche Kiches.

Description : Stems winged, up to 1 m long; petioles narrowly winged; leaflets linear or narrowly lanceolate, 5 to 10 cm long. Flowers pink or blue to white, 1.5 to 20 cm long. Pods oblong, 3 to 4 cm long, 1.0 to 1.5 cm wide, 2 to 4 seeded. Seeds faceted, heart-shaped, greyish-brown or yellowish, usually spotted or mottled, with a distinct coloured line running from hilum to the notch.

Part used : Seed.

Distribution : Plant is a native of Southern Europe and Western Asia but is common in India.

History and authority : Allen: *Encyclop. Mat. Med.*, Vol. V, 504; Clarke: *A Dictionary of Practical Mat. Med.* Vol. II, 248.

Preparation : (a) Trituration 1x Drug strength 1/10

Lathyrus Sativus	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Revised Monograph Appeared in HPI Vol. VIII

LAUROCERASUS
(Lauroc.)

Botanical name : *Prunus laurocerasus* Linn. **Family**: Rosaceae

Synonyms : *Cereasus lauroceras* Lowel, *Padus laurocerasus* Mill., *Laurocerasus officinatis* Roeme.

Common names : *English*: Cherry laurel; *French*: Laurier-cerise; *German*: Kirschlorbeer.

Description : A small, evergreen shrub or a small tree. Leaves coriaceous and glossy, short stalked, oval, lanceolate, oblong-elliptic or oblanceolate, narrowed into a short point. Flowers small, white with yellowish tinge, in axillary or terminal short recemes, the calyx lobes 3-toothed. Fruit ovoid-acute, small and blackish.

Part used : Leaf.

Microscopical : Leaf: shortly petiolate with a simple coriaceous lamina from 12 to 17 cm long and from 4 to 5 cm broad, oblong-lanceolate to oblong-obovate, the apex acuminate and recurved. Margin distinctly serrate and slightly revolute; upper surface dark-green and glossy, lower surface paler. Mid-rib prominent below, venation pinnate. One or two nectaries occur on lower surface at the base of the lamina on either side of the mid-rib. When bruised it gives characteristic odour of *prussic acid* and *benzaldehyde.*

Distribution : Indigenous to Persia and Turkey, cultivated in temperate regions.

History and authority : Proved and introduced in 1828 by Jorg, Hartlaub and Nenning; Hering: *Guiding symptoms,* Vol. VII, 27; Allen: *Encyclop. Mat. Med.,* Vol. V, 506.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Laurocerasus in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	637 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

LEMNA MINOR
(Lemna m.)

Botanical name : *Lemna minor* Linn. **Family**: Lemnaceae

Common name : *English*: Common Duck weed.

Description : Plant consists of minute thalli, each bearing a single root on the under surface. Thallus circular to elliptic or bovate symmetrical or nearly so, convex on both sides 3 to 6 mm long, 1.5 to 3 mm wide, obscurely 3 nerved, comparatively thick at margin, rounded to acute at base, solitary or in colony of 2 to 8, green above; root sheath not appendaged, cap obtuse, spathe 2-lipped; stamens 2 (each a male flower); style long, seed horizontal, hemianatropal, albuminous.

Part used : Whole plant.

Microscopical : Upper epidermis of highly sinuous cells with anomocytic stomata, 20 to 24 µ by 12 to 20 µ, lower epidermis of polygonal cells, some containing raphides, 40 to 80 µ long, stomata being absent; chlorenchymatous spongy tissue; conducting tissue of elongated thin-walled parenchyma cells. Stomatal number 36 to 40 per sq. mm, stomatal index 10 to 15.

Identification : Evaporate 25 ml of 40 percent alcoholic extract to remove *ethanol.* Extract the aqueous portion with *chloroform : acetone : water* (40 : 25 : 35 v/v) as solvent system. One blue fluorescent spot appears at R_f 0.88 under UV light.

Distribution : Throughout India, commonly occurring in flooded rice fields of West Bengal.

History and authority : Clark: *A Dictionary of Practical Mat. Med.,* Vol. II, 267.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Lemna minor, moist magma containing solids 100 g and plant moisture 600 ml	700 g
Strong Alcohol	400 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, five parts of Purified Water and four parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LYCOPUS VIRGINICUS
(Lycop. v.)

Botanical name : *Lycopus virginicus* Linn. **Family**: Labiatae (Lamiaceae)

Synonym : *Lycopus uniflorus* Michx.

Common names : *English*: Bugle weed; *French*: Lycope de Virginie; *German*: Virginischer.

Description : A deciduous, perennial herb, with creeping roots, which are sometimes tuberous. Leaves lanceolate or ovate-lanceolate to elliptic or narrowly rhomboid, 5 to 12 cm long, 1.5 to 5 cm wide, acuminate, coarsely serrate, the lowest tooth located not far below the middle of the blade, the margin below it concave and continued along the midvein nearly or quite to the stem. Bracts minute. Calyx-lobes ovate or triangular ovate, less than 1 mm long. Fruit nutlets, at maturity longer than the calyx-lobes and concealing them, the set of four almost flat across the tuberculate summit, each one 1.5 to 2 mm long, 1 to 1.5 mm wide, the inner angle nearly as long as the outer angle and ending in a tubercle. The plant yields a black dye which gives permanent colour to wool and silk.

Part used : Whole plant

Identification : North America

History and authority : Proved by N. S. Davis; Allen: *Encyclop. Mat. Med*., Vol. VI, 69; Hering: *Guiding Symptoms*, Vol. VIII, 150.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Lycopus Virginicus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture; three parts Purified Water and six part *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

MANGANUM CARBONICUM
(Mang. carb.)

Chemical formula : $MnCO_3$ **Mol. wt.**: 114.94

Common names : *English*: Manganese carbonate; *French*: Carbonate de manganese; *German*: Mangen carbonat.

Description : White powder but acquires a light brown colour on exposure to air. Insoluble in *water;* soluble in *dilute hydrochloric acid*. Contains not less than 44.0 percent and not more than the equivalent of 48.0 percent of Mn with reference to the substance dried at 105° to constant weight.

Identification : Yields reactions characteristic of *manganous salts* and *carbonates*, H.P.I., Vol. I,

Nitric acid insoluble matter : Dissolve 5 g in a mixture of 80 ml of *water* and 20 ml of *nitric acid*. Filter, wash the insoluble residue with hot *water* and ignite. Its weight does not exceed 2.5 mg.

Alkali carbonate : Boil 2.0 g with 30 ml of *water*, wash with 20 ml of hot *water*, cool and add to the filtrate 2 drops of *phenolphathalein*. If a pink colour is produced, it requires not more than 0.2 ml of 0.02 N *hydrochloric acid* to discharge it.

Chloride : Dissolve 1.0 g in a mixture of 3 ml of *nitric acid* and 20 ml of *water*, adding sufficient 30.0 percent *hydrogen peroxide* to dissolve any oxidised manganese. Dilute to 200 ml. To 20 ml add 1 ml of *silver nitrate solution*. Any resulting turbidity is not greater than that obtained with standard solution as per *limit test of chlorides*, H.P.I., Vol. I,

Solution 'S' : To 5.0 g add 20 ml of *water* add 30 percent *hydrochloric acid* to dissolve. Evaporate to dryness on a water bath, dissolve the residue in 50 ml of *water*, filter, if necessary, dilute to 100 ml with *water* and retain for other tests.

Sulphate : To 20 ml of *solution 'S'* add 1 ml of 0.1 N *hydrochloric acid* and make up to 25 ml with *water* and apply *limit test for sulphates*, H.P.I., Vol. I,

Alkaline earth etc. : Dilute 20 ml of *solution 'S'* to 85 ml with *water* and add 15 ml of *ammonium hydroxide solution*. Precipitate the *manganese* with *hydroxide* solution and filter. To 50 ml of the filtrate, add 5 drops of *sulphuric acid*, evaporate and ignite. Not more than 1.5 mg of residue remains.

Heavy metals : To 5 ml of the *solution 'S'* add *lead solution*, equivalent to 0.01 mg *lead* and 1 ml of 1 N *acetic acid* and dilute to 40 ml (A). To 15 ml

of solution 'S', add 1 ml of 1 N *acetic acid* and dilute to 40 ml (B). Then to each add 10 ml *hydrogen sulphide solution*. B is not darker than A.

Iron : To 7 ml of *solution 'S'* add 2 ml of *hydrochloric acid* and dilute to 30 ml and apply *limit test for iron,* H.P.I., Vol., I,

Nickel : Dilute 2 ml of *solution 'S'* to 30 ml, add 2 g of *sodium acetate* and 10 ml of *hydrogen sulphide solution* and after 1 minute add 5 ml of *glacial acetic acid*. Any colour produced is not darker than that in a blank to which *standard nickel sulphate solution* is equivalent to 0.05 mg of Ni has been added.

Zinc : To 30 ml of *solution 'S'* add 1 ml of *sulphuric acid* and mix (A). To 10 ml of *solution 'S'*, add 2 ml *standard zinc solution* (0.02 mg of Zn), dilute to 30 ml and add 1 ml of *sulphuric acid* (B). Then to each add 1 ml of freshly prepared *potassium ferrocyanide solution*, stir well and allow standing for 10 minutes. A is no more turbid than B.

Assay : Weigh accurately about 0.5 g and dissolve in 50 ml of *water* and 3 ml of *nitric acid.* Filter and wash well with *water*. To the combined filtrate and washings add 10 ml of *ammonium hydroxide solution* and 5 ml of 30 percent *hydrogen peroxide solution,* previously diluted with 30 ml of *water* and boil until precipitation is complete. Filter, wash with hot *water* and ignite to red heat. The weight of the Mn_3O_4 multiplied by 0.7203 represents the Mn content.

History and authority : Proved and introduced by Hahnemann: *Chronic Disease,* 959; Allen: *Encyclop. Mat. Med.,* Vol. VI**,** 151; Hering: *Guiding Symptoms,* Vol. VII, 272.

Preparation : (c) Trituration 1x — Drug strength 1/10

Manganum Carbonicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

MERCURIUS CYANATUS
(Merc. cy.)

Chemical formula : $Hg(CN)_2$ **Mol. wt.**: 252.62

Common names : *English*: Mercuric cyanide; *French*: Cynaure de mercure; *German*: Quecksilbercyanid.

Description : Colourless, transparent or white prismatic, anhydrous crystals, odourless. Freely soluble in *water*, *alcohol* and *glycerin.* Sparingly soluble in *ether.* Contains not less than 99.0 percent of $Hg(CN)_2$ with reference to the substance dried at 105° to constant weight.

Identification : (1) Gives reactions characteristic of *cyanides*.

(2) Solution in *water*, after warming with *dilute nitric acid*, yields reactions characteristics of *mercuric salts*, H.P.I., Vol. I,

Chloride : 1 g complies with the *limit test for chlorides*.

Sulphate : 2 g complies with the *limit test for sulphate,* H.P.I., Vol. I,

Residue on ignition : Leaves not more than 0.1 percent of its weight, when ignited to constant weight.

Mercuric oxycynide : Dissolve about 1 g in 20 ml of *water* and add 1 g of *sodium chloride*. There is no red or pink coloration on addition of drops of *phenolphthalein solution*.

Assay : Dissolve about 0.4 g, accurately weighed, in 50 ml of *water*, add 1 g of *sodium chloride* followed by 2 to 3 g of *potassium iodide* and titrate with 0.1 N *hydrochloric acid* using *methyl orange* as indicator. Each ml of 0.1 N *hydrochloric acid* is equivalent to 0.01263 g of $Hg(CN)_2$.

History and authority : Introduced by Beck, *Rev Hom.* from XII, 153; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 465; Allen: *Encyclop. Mat. Med.*, Vol. I, 263.

Preparation : (a) Trituration 2x — Drug strength 1/100

Mercurius Cyanatus	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 3x to be stored in amber coloured container.

Caution : No to be dispensed below 3x.

MEDORRHINUM
(Medor.)

Microbiological name : *Noisseria genetthceae* Neissor 1879.

History and authority : Introduced and proved by Swan and others; Allen: *Materia Medica of Nosodes*, 282.

Biological distributions: Organisms are always present in lesions in persons suffering from gonorrhoea. They are found in abundance, in the urethral discharge from patients of acute gonorrhoea.

Source for the preparation of homoeo drug : Urethral discharge from patients having established acute gonorrhoea.

Morphology of the organism : Oval or spherical coccus; 0.8 μ frequently arranged in pairs, with adjacent sides flattened or slightly concave, resembling a pair of kidney beans; long axis of oval lies at right angles to axis joining the two cocci. In culture, great variation in size and in depth of staining occurs, due to autolysis; in the body, the cocci are more regular and are generally intracellular. Non-mobile, non capsulated, gram negative, GC 50 meles percent.

Cultural characteristics : *In Serum Agar* plate; on 24 hours, 37°, round convex or slightly umbonate, greyish-white, translucent, amorphous colonies, 5.1 mm in diameter, with smooth, glistening surface and entire edge; consistency butyrous or slightly viscid, fairly easily emulsifiable. Later, colonies increase in size and may develop a roughened surface and a crenated edge.

Resistance and Metabolism : Highly susceptible to inimical agencies, when dried the cocci succumb in an hour or two, killed by moist heat at 55° in less than 5 minutes and at 42° in 5 to 15 hours. In serum culture, they are killed by 1/4000 silver nitrate in 7½ minutes and in pus in 2 minutes. Sealed cultures kept at 37° may live for 4 or 5 weeks; when kept at room temperature, they die in a day or two.

Optimum H-ion concentration for growth is pH 6.75 to 7.5. Optimum temperature for growth is 37°; no growth under 30° or over 28.5°. Fails to grow in plain agar as a rule; requires the presence of serum, blood, ascitic fluid or hydrocele fluid; glucose is not beneficial. Aerobic, but growth is said to improve by a lowered oxygen pressure, by presence of SH groups and by 20 percent of carbon dioxide in the atmosphere. Little or no growth under strictly anaerohic conditions.

Biochemical : Produces acid, no gas, in glucose, no change in litmus milk. Nitrates not reduced. Catalase+Oxides+MB reduction—; MR—; VP—; indole—; H_2S—O.

Preparation : (a) Under Nosode, Group N-11, suspension consisting of 20 x 10^{10} germs/ml is obtained. Proceed according to "General Instructions for preparation of Nosodes" Group-N-11 to obtain 1X.

(b) Trituration 2x — Drug strength 1/100

Medorrhinum 1X	1.0 ml
Saccharum Lactis	99.0 g

to make one hundred grammes of the trituration.

(c) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x to be stored at a temperature about 5° and are not to be allowed to freeze.

Caution : (a) Not to be dispensed below 6x.

(b) 6x should be free from live germs and should pass the test for sterility as mentioned in Drugs Act.

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MERCURIALIS PERENNIS

(Mer. per.)

Botanical name : *Mercurialis perennis* Linn. **Family**: Euphorbiaceae

Common names : *English*: Dog's Mercury; *French*: Mercuriale vivace; *German*: Bingelkraut.

Description : A deciduous herb, with creeping roots. Stem square, unbranched, leafy above, about 30 cm high. Leaves 5 to 7.5 cm long, opposite, petiolate, ovate, acute, serrate with small stipules. Flowers in long lateral erect spikes, with sterile flowers higher in number than the fertile ones; male and female plants on separate stalks.

Part used : Whole plant.

Microscopical : Petiole in cross section shows three vascular bundles, collateral, widely spaced, appearing in a shallow arc. Stem without perecyclic sclerenchyma; xylem in a continous cylinder; vessels with scalariform perforation plates.

Distribution : Europe.

History and authority : Proved and introduced by Hesse, *H. Archiv. f. Hom.*, (1), (2), 141; Allen: *Encyclop. Mat. Med.,* Vol. VI, 193; Hering: *Guiding Symptoms,* Vol. VII, 342; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 435.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Mercurialis Perennis in *coarse powder*	100 g
Purified Water	537 ml
Strong Alcohol	500 ml

to make one thousand millilitres of the Mother tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

MERCURIUS VIVUS
(Merc. viv.)

Chemical formula : Hg **At. wt.**: 200.59

Common names : *Hindi*: Para; *English*: Mercury; *French*: Mercure; *German*: Quecksilver.

Description : Shinning silvery-white heavy liquid. Pours freely without tailing from a glass vessel, leaving the vessel free from *mercury*. Easily divisible into globules and extremely mobile, readily volatilises on heating. Soluble in *nitric* acid and in boiling *sulphuric acid*. Insoluble in *water*, in *alcohol*, in *hydrochloric acid* and in cold *sulphuric acid*. Specific gravity 13.6. Contains not less than 99.5 percent of Hg.

Non-volatile matter : Evaporate 10 g under the hood in a tared porcelains crucible. After the *mercury* has almost evaporated, ignite gently. The residue weighs not more than 0.02 percent of its weight.

Iron : Dissolve 3.3 g in 4.5 ml of *nitric acid*, add 5 ml of *water* and evaporate almost to dryness on a steam-bath. Dissolve the residue due in 10 ml of 2 N *nitric acid*, 9 M *ammonium nitrate solution*. It complies with the *limit test for iron*, H.P.I., Vol. I,

Lead : To the residue obtained in the test for non-volatile matter add 2 ml of *hydrochloric acid* and 0.5 ml of *nitric acid* and evaporate to dryness on a water bath. Dissolve the residue by heating with a mixture of 0.2 ml of *dilute hydrochloric acid* and 25 ml of *water*, cool and dilute to 50 ml with *water*. To 20 ml of this solution, add 5 ml of *dilute ammonium hydroxide solution* and 1 ml of *potassium cyanide solution*, dilute with *water* to 50 ml and add 2 drops of *sodium sulphide solution*. Any brown colour produced is not deeper than that obtained with 2 drops of *sodium sulphide solution* are added to a mixture of 2 ml of *lead* solution (1 ml= 0.01 mg Pb), 42 ml of *water*, 5 ml of *dilute ammonium hydroxide solution* and 1 ml of *potassium cyanide solution*.

Assay : Dissolve 0.04 g in 20 ml of a mixture of equal parts of *water* and *nitric acid* and heat gently until the solution is colourless. Add 150 ml of *water* and sufficient *potassium permanganate solution* to produce a permanent pink colour. Decolorise by the addition of a trace of *ferrous sulphate* and titrate with 0.1 N *ammonium thiocyanate* at a temperature not exceeding 20°, using ferric *ammoniumsulphate solution* as indicator. Each ml of 0.1 N *ammonium thiocyanate* is equivalent to 0.01003 g of Hg.

History and authority : Proved and introduced by Hahnemann: *Mat. Med. Pura*, Vol. II, 144; Hering: *Guiding Symptoms*, Vol. VII, 347; Allen: *Encyclop. Mat. Med.*, Vol. X, 578.

Preparation : (a) Trituration 1x — Drug strength 1/10

Mercurius Vivus	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

MILLEFOLIUM
(Millef.)

Botanical name : *Achillea millefolium* Linn. **Family**: Compositae (Asteraceae)

Synonym : *A. lanulosa* Nutt Achillea.

Common names : *Hindi*: Gandane; *English*: Yarrow; *French*: Herbe au charpentier; *German*: Schafgarbe.

Description : An erect, pubescent herb. Stem 15 cm to 62 cm, leafy grooved. Leaves alternate, oblong-lanceolate, 5 to 10 cm in length and 0.65 to 1.95 cm in width, 3-pinnatisect; segments linear, acute, radical leaves stalked, upper sessile. Heads radiate, 0.65 cm in diameter crowded in compound corymbs. Involucral bracts few, erect, outer ones shorter; receptacle flat, covered with thin oblong scales nearly as long as the flowers. Flowers white or pale pink; pappus none; ligules rounded, reflexed; corolla of disk flower, 5-lobbed. Fruit achenes oblong, flattened, shining. Odour fragrant; taste bitter and peculiar.

Part used : Whole plant.

Microscopical : Leaf: epidermal cells of both sides stretched longitudinally with sinuous walls and a folded cuticle; stomata on both the surfaces, hairs up to 100 μ in length consisting of several short basal cells and terminating into one very long terminal cell; volatile oil glands consisting of eight (rarely six) excretory cells arranged in two rows and four rows (rarely three layers).

Distribution : In Western Himalayas especially around Simla. It is indigenous to North Asia, Europe and America.

History and authority : Proved and introduced in 1833 by Nenning, Hartlaub and Trinks *Annal. d. H. Ktlnik;* Allen: *Encyclop. Mat. Med.,* Vol. VI, 366.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Millefolium, moist magma containing solids 100 g, plant moisture 200 ml	300 g
Purified Water	200 ml
Strong Alcohol	635 ml

to make one thousand millilitres of Mother Tincture

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

MYRTUS COMMUNIS
(Myrt. com.)

Botanical name : *Myrtus communis* Linn. **Family**: Myrtaceae

Common names : *Hindi:* Vilayati Mahendi; *English:* Common myrtle.

Description : An evergreen shrub, 1.0 to 3.0 m or more high, leaves strongly scented, small, ovate or lanceolate, entire smooth, shining, coriaceous; peduncles solitary; flowers white and reddish with two axillary linear bractlets; berries ellipsoid, blue black; seeds white, kidney shaped.

Part used : Whole plant excluding roots.

Identification : Evaporate *alcohol* from 10 ml of the alcoholic extract (10 g of drug extracted with 100 ml of 70 percent *ethanol*) and extract with *chloroform* in separating funnel and separate *chloroform* and aqueous layers.

(i) Carry out TLC of chloroform layer on silica gel 'G' plate having mobile phase *benzene : methanol* (95 : 5)*;* gives two spots under UV light having R_f values 0.42 and 0.90 and after spraying with saturated solution of *antimony trichloride* in *chloroform* three more sports having R_f value 0.37 (violet), 0.62 (blue) and 0.69 (violet) are observed.

(ii) Carry out TLC on silica gel 'G' plate having mobile phase *butanol : aceteic acid : water* (4 : 1 : 1), gives two yellow spots at R_f values 0.84 and 0.92 after spraying with 1 percent *ethanolic aluminium trichloride.*

Distribution : North-West Himalayas.

History and authority : Introduced by Wahle, *Ruck. Kl. Erf.*, Vol. VI, 842, *N. A. Jour. Hom.* I, 74; Hering: *Guiding Symptom*, Vol. VII, 528.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Myrtus Communis, moist magma containing solid 100 g and plant moisture 300 ml	400 g
Strong Alcohol	730 ml

to make one thousand millitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

NAPHTHALINUM
(Naphth.)

Chemical forumula : $C_{10}H_8$ **Mol. wt.**: 128.18

Common names : *English* and *French*: Naphthalene; *German*: Naphtalen.

Description : Colourless transparent scales or crystals or a white crystalline powder; odour, characteristic; taste, pungent. Slowly volatilises at room temperature. Freely soluble in *chloroform*, in *benezene* and in *toluene*; soluble in *alcohol*; almost insoluble in *water*.

Identification : (i) When ignited, burns with black smoke.

(ii) Dissolve 1g in 10 ml of *ether*. To 1 ml add 20 ml of 1 percent w/v solution of *picric acid* in *ether*. Concentrate to about 10 ml on a water bath, cool and collect the yellow crystals, wash with small amounts of *ether*, dry in dessicator over *silica gel* for 6 hours. Crystals melt between 149° and 153°.

(iii) Produces a colourless solution with *sulphuric acid.*

Melting point : 80° to 82°.

Reaction : Boil 1 g with 10 ml of *water* for 2 minutes. Cool and filter. The filtrate is neutral to *litmus solution*.

Phenol and phenol esters : Boil 10 g with 10 ml of *sodium hydroxide solution* and 40 ml of 40 ml of *water* for 2 to 3 minutes. Cool and filter. Acidify the filtrate with *dilute sulphiric acid* and add 5 drops of *bromine solution*. No turbidity is produced.

Residue on ignition : Leaves not more than 0.1 percent of its weight, when ignited to constant weight.

Light absorption : Extinctions of a 1 cm layer of 1 percent w/v solution in *alcohol* at 266 mμ, 275 mμ and 286 mμ not greater than 411, 454 and 307 respectively.

Readily carbonisable substances : Place 0.5 g with 5 ml of *nitrogen free sulphuric acid* (95.5 to 96.0 percent w/w) in a clean, dry test tube, about 25 mm long and 18 mm in internal diameter, which is fitted with a glass stopper and graduated at 5 and 10 ml. Insert the stopper and shake as vigorously as possible in the longitudinal direction of the tube for 5 seconds. Loosen the stopper immediately and place the tube in a bath of boiling *water*, supporting it so as to prevent contact of the tube with the bottom or side of the bath and heat for 10 minutes. At the end of the second, fourth, sixth and eight minutes, remove the tube from bath and shake as vigorously as possible, in the longitudinal direction of the tube for 5 seconds. At the end of 10 minutes,

transfer the liquids to a small dry separator with an ungreased tap, allow standing for 10 minutes and running off the lower layer into a colourless rectangular glass cell of 10 mm internal measurement in the direction of observation. Place the cell in a colorimeter designed for matching the colour of the solution against colour glasses and compare the colour of the test liquid with the colour given by the combination of the colour glasses for *sulphuric acid* test on liquid *paraffin*. The colour of the test liquid is not deeper than the combined colour of the prescribed glasses either with respect to the red component or with respect to the yellow component.

History and authority : Introduced by Lippincott; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 530.

Preparation : (a) Trituration 1x — Drug strength 1/10

Naphthalinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preserve in well-closed containers protected from light.

NARCEINUM
(Narc.)

Chemical forumula : $C_{23}H_{27}NO_8.3H_2O$ **Mol. wt.**: 499.45

Common names : *English*: Narceine; *German*: Narcein.

Description : Narceine is one of the alkaloids of opium. White slender needles or prisms; odourless; taste, slightly bitter; optically inactive. Soluble in hot *alcohol* (80 percent); sparingly soluble in cold *water* and in 80 percent *alcohol*; slightly soluble in *chloroform*; insoluble in *ether* and in *benzene*. Contains not less than 99.5 percent of $C_{23}H_{27}NO_8$ with reference to the substance dried at 105° to constant weight.

Identification : (1) To the solution in *water*, add a few mg of *iodine* or a few ml of mineral acid, blue colour is produced.

(2) To the solution in *dilute hydrochloric acid*, add *picric acid solution* and heat on a water bath. The picrate is formed which melts at 195°.

Melting point : 174° to 176°.

Reaction : pH of a saturated solution, 5.8.

Loss on drying : Loses not more than 10.5 percent of its weight, when dried to constant weight at 105°.

Thin layer chromatography : Carry out TLC, using *silica gel* G plate and *methanol* : *acctone* : *triethanolamine* (50 : 50 : 1.5) as the mobile phase. One spot appears at R_f 0.23.

Assay : About 0.5 g, dissolve accurately weighed and previously dried to constant weight, in *glacial acetic acid*. Add 100 ml more of *glacial acetic acid*. Titrate against 0.05 N *perchloric acid* using *crystal violet solution* as an indicator. Each ml of 0.05 N *perchloric acid* is equivalent to 0.02306 g of $C_{23}H_{27}NO_8$.

History and authority : Proved and introduced by Enelmberg; Allen: *Encyclop. Mat. Med.*, Vol. VI, 466.

Preparation : (a) Trituration 1x — Drug strength 1/10

Narceinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NATRUM ARSENICUM
(Nat. Ars.)

Chemical formula : $Na_2HAs\ O_4.7H_2O$ **Mol. wt.**: 312.00

Common name : *English*: Disodium hydrogen arsenate.

Description : White amorphous, granular powder, odourless; hygroscopic. Contains not less than 99.5 percent of $Na_2HAsO_4.7H_2O$. Soluble in *water*, slightly soluble in *alcohol*.

Identification : Yields the reactions characteristic of *sodium* and *arsenic*. H.P.I., Vol. I,

Loss on Drying : Dry about 1 g, accurately weighed to constant weight at 105°. Loses not more than 40 percent of its weight.

Water insoluble matter : Heat about 10 g in 100 ml of *water* for 15 minutes. Filter and wash with *water*. Dry the residue at 105°. The residue should not weigh more than 1.0 mg.

Arsenite : Dissolve 10 g in 75 ml of *cold water* and make the solution acidic with *dilute sulphuric acid*. Add 2 g of *sodium bicarbonate* and *starch solution* and titrate with 0.02 N *iodine* to a blue colour. Not more than 0.3 ml of the *iodine* is consumed.

Chloride : 1 g complies with the *limit test for chlorides*, H.P.I., Vol. I,

Sulphates : 2.5 g complies with the *limit test for sulphates,* H.P.I., Vol. I,

Assay : Dissolve an accurately weighed about 0.5 g of the dried sample in 50 ml of in a glass stoppered flask. Heat the solution to 80°, add 10 ml of *hydrochloric acid* and 3 g of *potassium iodide*, stopper and keep for 15 minutes. Cool and titrate the librated *iodine* with 0.1 N *sodium thiosulphate,* using *starch indicator* towards the end. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01560 of Na_2HAsO_4.

History and authority : Proved and introduced by Imbert. Gourbeyre, *Art. Mat. Med.* 17, 440 (1863); Allen: *Encyclop. Mat. Med.*, Vol. VI, 473; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 534; Hering: *Guiding Symptoms*, Vol. VII, 534.

Preparation : (a) Trituration 2x — Drug strength 1/100

Natrum Arsencium	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NATRUM NITRICUM
(Nat. nit.)

Chemical formula : $NaNO_3$ **Mol. wt**.: 85.0

Common names : *English*: Sodium nitrate; *French*: Azotate (nitrate) de soude; *German*: Chilisal peter.

Description : Anhydrous, transparent, colourless, slightly deliquescent crystals having moist appearance, odourless; taste cooling, saline and somewhat bitter. Freely soluble in *water* and sparingly soluble in *alcohol*. Contains not less than 99.0 percent of $NaNO_3$ with reference to the substance dried to a constant weight over silica gel.

Identification : Yields the reactions characteristic of *sodium*, H.P.I., Vol. I, and *nitrates*, H.P.I., Vol. I,

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Lead : Not more than 10 parts per million, H.P.I., Vol. I,

Ammonium compound: Warm 1 g with 10 ml of *sodium hydroxide solution*; no odour of *ammonia* perceptible.

Chloride : 1.0 g complies with *limit test for chlorides*, H.P.I., Vol. I,

Sulphate : 0.5 g complies with the *limit test for sulphates*, H.P.I., Vol. I,

Assay : Dissolve 0.5 g accurately weighed in 300 ml of *water* in an ammonia distillation apparatus, add 3 g of *Devarda's alloy* and 10 ml of *sodium hydroxide solution* and distil. Collect distillate in 50 ml of 0.1 N *hydrochloric acid* and titrate the excess with 0.1 N *sodium hydroxide*, using *methyl red solution* as indicator. Repeat the operation without *sodium nitrate*. The difference between the titrations represents the acid required to neutralise ammonia obtained from sodium nitrate. Each ml of 0.1 N *hydrochloric acid* is equivalent to 0.0085 g of $NaNO_3$.

History and authority : Proved and introduced by Weidner; Allen: *Encyclop. Mat. Med.*, Vol. VI, 598; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 562.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted into liquid 8x, H.P.I., Vol. I,

NITRI SPIRITUS DULCIS

(Nit. s. d.)

Description : Transparent, faintly yellow liquid; odour, characteristic, penetrating, apple-like. It may be prepared by distilling a mixture of *alcohol* (90 percent), *sulphuric acid* and *nitric acid* with *copper* and collecting the distillate in a receiver containing *alcohol* (90 percent). Contains not less than 1.25 and 2.5 percent of *ethyl nitrite.*

Identification : Add 1 ml on the surface of a strong, aqueous solution of *ferrous sulphate* acidified with *sulphuric acid* taken in a test tube, a deep olive-brown ring is formed at the zone of contact.

Acidity : Dilute five times with *water* and add *thymol blue solution*, no pink colour is produced.

Wt. per ml. : 0.833 to 0.837 g.

Alcohol content : 84 to 87 percent v/v.

History and authority : Proved and introduced by Lembike; Allen: *Encyclop. Mat. Med.*, Vol. VII, 2.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Nitri Spiritus Dulcis — 100 ml

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Storage : To be kept in a well-closed container at a dry and cool place protected from light.

OLEUM ANIMALE
(Ol. anim.)

Common name : *English*: Bone oil.

Description : Nearly black liquid; odour, offensive and fetid. Freely soluble in *alcohol* and in *ether*. It is an empyreumatic oil obtained in the preparation of animal charcoal or bone-black and is purified and rectified for medicinal use. Commercial product is obtained by destructive distillation of bones in the manufacture of lamp-black and the crude product is purified by rectifying. When boiled it releases ammonia. Contains many acyclic bases such as pyrrole, pyridine and quinoline.

Wt. per ml : About 0.97.

Boiling point : 80°.

History and authority : Proved by Nenning, Hartlaub and Trinks *R.A.M.L.*, 2; Allen: *Encyclop. Mat. Med.*, Vol. VII, 149; Hering: *Guiding Symptoms*, Vol. VIII, 193.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Oleum Animale	100 ml
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

(c) Trituration 2x — Drug strength 1/100

Oleum Animale	10 ml
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

PAEONIA OFFICINALIS
(Paeon. of.)

Botanical name : *Paeonia officianalis* Linn. **Family**: Ranunculaceae

Synonym : *Paeonia fulgida* Sabine.

Common names : *English*: Peony; *French*: Pivoine; *German*: Gichtrose.

Description : Perennial herb, up to 1 m high. Stem stout, 1-headed. Leaves dark above, pale beneath the lower more divided than the others having 15 to 20 oblong-lanceolate leaflets, leaflets 2.5 cm or more broad; outer sepals leaf like; petals dark crimson, 3 to 5 cm broad, obovate; stigmas crimson, recurved; follicles 2 to 3, becoming 2.5 cm long.

Part used : Root.

Macroscopical : Occurs as pieces averaging 7.6 cm long and 1.25 to 1.9 cm in diameter, fasciculated, many headed, spindle shaped, strongly furrowed and shrunken longitudinally, dark brown externally and white and granular within. Transverse section starchy and radiate, the rays more or less tinged with purple; odourless; taste sweet at first and then bitter.

Microscopical : Root: 5 to 6 layered phellem; a considerably wide parenchymatous cortex consisting of 15 to 23 layers of oblong cells and 20 to 30 layers of isodiametric cells; central stele of conjoint open vascular bundles arranged in a ring; 2 to 4 layered interfascicular cambium xylem vessel oblong, oval and isodiametric with starch grains, xylem vessels with scalariform and reticulate thickening, wood fibres long thick-walled septate and non-septate; phloem narrow of sieve tubes and companion cells; pith parenchymatous containing starch grains and aggregate crystals of calcium oxalate.

Distribution : Europe and West Asia.

History and authority : Proved and introduced by Schelling in 1845; Allen: *Encyclop. Mat. Med*., Vol. VII, 276; Hering: *Guiding Symptoms*, Vol. VIII, 244.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Paeonia Officinalis in *coarse powder*	100 g
Purified Water	420 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

PARIS QUADRIFOLIA
(Paris q.)

Botanical name : *Paris quadrifolia* Linn. **Family**: Liliaceae

Common names : *English*: Herb Paris; *French*: Parisette; *German*: Einbeere.

Description : Perennial herb, with creeping, fleshy root stock. Root vertical rampant, rounded, jointed fleshy, whitish. Stem erect, single, round, unifloral and smooth. Leaves all cauline with short petioles, broad-elliptical or oval, pointed, entire, glabrous, disposed as a cross shining beneath with reticulate venation being exceptional among monocotyledons, calyx four-leaved, greenish-yellow; peduncles rising 2.5 to 5 cm above leaves, furrowed; perianth-segments yellowish-green, the 4 inner ones rather more yellow. Fruit bluish-black berry shining, slightly quadrangular. Odour of leaves and berries disagreeable and narcotic; the taste of roots pungent and nauseous.

Part used : Whole plant.

Distribution : North and Central Europe, Siberia and Asia Minor.

History and authority : Introduced by Dr. Staf, *Archiv, f. Hom.* 8,1,177 (1829); Allen: *Encyclop. Mat. Med.*, Vol. VII, 282; Hering: *Guiding Symptoms*, Vol. VIII, 266; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 723.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Paris Quadrifolia in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

PETROSELINUM SATIVUM
(Petr. sat.)

Botanical name : *Peteroselinum cripsum* (Mill) Mym.

Family: Umbelliferae (Apiaceae)

Synonyms : *Peteroselinum sativum* Hoffin, *Carum petroselinum* Benth & Hook, *Apium cripsum* Mill, *Petroselinum hortensis* Hoffin.

Common names : *English*: Common or garden parsley; *French*: Persil; *German*: Gemeine Peterselie.

Description : An aromatic, hardy biennial herb. Stem at anthesis up to 1 m in height, much branched. Leaves, ternately pinnate decompound; leaflets being small ovate, 3-cleft and toothed curly, green. Flowers, yellow, in compound umbels with many parted involucre. Fruit, cremocarp ovate, mericarps usually separated from 2 to 3 mm in length and about 1 mm in diameter. Odour and taste characteristic agreeable and aromatic.

Part used : Whole plant.

Microscopical : Stem: not smooth in transverse section and with one deep groove, single layered epidermis of thick-walled cells, collenchyma only at ridges, angular, 5 to 12 cells wide; cortex parenchymatous; conjoint, collateral, open and endarch vascular bundles with a patch of sclerenchyma above phloem occur below each rib. A prominent oil cavity above each vascular bundle; wide zone of spongy tissue consisting of irregular large loosely arranged parenchyma cells with a large central air cavity. Endodermis indistinct.

Root: a wide cortex of diagonal, oval, irregular parenchyma cells with a few oil cavities scattered in it, a ring of cambium; widely spaced vascular bundles consisting of narrow, radiating upwards, secondary phloem and xylem extending deep into the ground tissue; isolated xylem, patches embedded in ground tissue below secondary xylem; a wide pith of homogenous irregular cells, starch grains with central hilum and circular lamelae.

Leaflet: striated cuticle covering epidermis, upper epidermal cells rectangular at the main veins these are larger. Lower epidermal cells less rectangular than the upper and not ballooned over the veins; mesophyll consisting of two layers of palisade cells and spongy tissue; palisade cells 40 to 55 μ in length; vascular bundles traversing the spongy mesophyll conjoint, collateral and open. Collenchyma tissue present on both sides being more abundant on the upper side. Adjacent to phloem tissue there is an oil-cavity. Stomata on both upper and lower epidermis, anisocytic and anomocytic in surface view with stomatal index of upper epidermis 16 to 21 per sq. mm and lower to 20 to 29 per sq. mm.

Rachis: shows an upper and lower epidermis of striated cells covered by cuticle and is ribbed; a large central fibro vascular bundle with thin-walled fibres, outer and inner mesophyll tissue of small parenchyma cells with chloroplasts. A central mesophyll tissue of large empty parenchyma cells, oil cavities and collenchyma tissue below each rib.

Distribution : Cultivated in India and other parts of the Europe.

History and authority : Proved and introduced by Bethman. *Archiv* XVIII, 3, 34, (1841); Allen: *Encyclop. Mat. Med.*, Vol. II, 333; Hering: *Guiding Symptoms*, Vol. VIII, 295.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Petroselinum Sativum, moist magma containing solid 100 g and plant moisture 450 ml	550 g
Strong Alcohol	586 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

POLYGONUM PUNCTATUM
(Poly. pun.)

Botanical name : *Polygonum punctatum* Ell. **Family**: Polygonaceae

Synonym : *P. hydropiperides* Pursh.

Common name : *English*: American water-pepper.

Description : Annual, stem slender, simple or branched, erect or ascending, up to 1 m. Leaves narrowly lanceolate or elliptic, glabrous, up to 20 cm long and 2 cm wide; ochrea (a sheath formed of two stipules united round the stem) glabrous or obscurely strigose. Racemes slender, erect or somewhat arched, up to 10 cm long, much interrupted especially towards the base where the internodes may be 2 to 3 cm long; lowers green sepals commonly about 2 mm long; pedicel exserted 1 to 2 mm at maturity. Fruit achenes, lenticular or trigonous, smooth and shining; 2.4 to 3 mm long, two thirds as wide.

Part used : Whole plant.

Identification : (1) Carry out TLC of 10 percent alcoholic extract of the drug using silica gel 'G' plate having *benzene* : *methanol* (9 : 1) as mobile phase, gives four spots in UV light having R_f Values 0.22, 0.28, 0.40 (red spots) and 0.89 (blue fluorescene). The same plate on spraying with saturated solution of *antimony trichloride* in *carbon tetrachloride*, two more violet coloured spots are detected having R_f values 0.22 and 0.65.

(2) Evaporate the alcohol, extract the aqueous layer with *chloroform* and then carryout the TLC of aqueous layer over silica gel 'G' plate using *butanol : acetone : water* (4 : 5 : 1) as mobile phase and 1 percent aqueous solution of *aluminium chloride* as spray reagent. A yellow coloured spot at R_f value 0.74 is developed.

Distribution : United States.

History and authority : Proved and introduced by Dr. Payme, *Trans. Am. Just of Hom.* 1859; Allen: *Encyclop. Mat. Med.*, Vol. VIII, 136; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 873.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Polygonum Punctatum in *coarse powder*	100 g
Purified Water	300 g
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts of Purified Water, six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

POLYPORUS OFFICINALIS
(Poly. off.)

Botanical name : *Polyporus officianalis* Fries **Family**: Polyporaceae

Synonyms : *Agaricus albus* Schaeff, *Bolatus officinalis* Vill.

Common names : *English*: Larch Agaric; *French*: Agaric blanc; *German*: Lar Cheush-wamm.

Description : Fructification of fungus that grows on Larch (Pine or spruce) trees. Of various sizes varying from 5 to 15 cm and shaped somewhat like a horse's hoof. Found as irregular, fibrous and somewhat spongy pieces of sporophore; externally greyish-white to pale brown; internally pale-yellow and resinous; fracture tough fibrous; odour indistinct and taste sweet, afterward acrid and lastly bitter.

Part used : Whole fructification.

Microscopical : The mycelium develops within and below the bark and sooner or later fruit bodies called basidiocarps or sporophors are formed. Leathery or corky and whitish or slightly greyish or brownish in colour. Upper surface smooth, rough or warted, often undulating while lower surface is porous. Fruiting body in section consists of (a) outer fibrous part made of thick-walled hyphae; (b) a tremma which is a loose mass of much branched septate and anastomosing hyphae; (c) a series of pores or tubes which extend from below the context to lower surface, the pores appear as innumerable minute holest and (d) a hymenium which is made of a distinct layer of basidia lining each pore. The basidia are club-shaped and project slightly into the pore, each bearing four short slender sterigmata, which form basidiospore at its end.

Distribution : Europe and Northern Aisa.

History and authority : Proved and introduced by Burt, *Am. Hom, Obs.* 1868, 116; Allen: *Encyclop. Mat. Med*., Vol. VIII, 141; Hering: *Guiding Symptoms*, Vol. VIII, 528.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Polyporus Officinalis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts *Purified Water* and six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

POTHOS FOETIDUS
(Poth. foe)

Botanical name : *Pothos foetidus* Mich. **Family**: Araceae

Synonym : *Ictodes foetida* (L.) Bigelow

Common names : *English*: Bear's foot; *French*: Racine de pothos fetide; *German*: Stinkende Drachenwurzel.

Description : Stemless and sub-aquatic; root vertically fibrous; truncate. Leaves smooth, green ovate-cordate, enlarging, protected by large glaucous, spathulate veinless bracts. Spathe ovoid, roundish hooded, obliquely acuminate; plaited involutely; auriculate at the base, thick and spongy livid purple spotted with blotches of pale green. Spadix pedunculate, simple almost spherical; bracts none. Flowers imbricate, adnate calyx 4-parted divided to the base, compressed at the apex, emerginate later becoming very thick; petals none; stamens 4, opposite the calyx lobes, filaments subulate, flat; anthers exserted, short, oblong, oval, 2-celled; style thick quadrangular, acuminated; stigma minute and pubescent. Seed naked large, round, enclosed in the common receptacles. Corculum small, involuate, erect, umblicately attached to a large solid, corneous perisperm.

Part used : Root.

Identification : (i) To 2 ml of 10 percent alcoholic extract add one drop of 2 percent *Molish* reagent and add by the side of test tube wall 2 ml of concentrate s*ulphiric acid*; a violet-brown ring is formed at the juncture of two layers.

(ii) To 2 ml of alcoholic extract add one drop of *alcoholic ferric chloride* solution; a light amber colour produced.

(iii) Evaporate 10 ml of alcoholic extract to 2 ml; extract with *chloroform :* evaporate the *chloroform* to 2 ml and spot on silica gel 'G' plate using *benzene* : *methanol* (95 : 5) as a mobile phase using *antimony trichloride* as spray reagent. Five spots are observed at the R_f of 0.25 (yellow), 0.29 (brown), 0.35 (brown), 0.70 (pink), 0.83 (pinkish-violet).

(4) Carry out the TLC of *chloroform* extract using silica gel 'G' plate using *methanol* : *ammonia* (100 : 1.5) as mobile phase. Two sports are observed under UV light at R_f 0.92 and 0.07.

Distribution : North America from Canada to Carolina.

History and authority : Introduced by Hering; Hering: *Guiding Symptoms*, Vol. VI, 137; Allen: *Encyclop. Mat. Med*., III, 154; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 4.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pothos Foetidus	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

PRUNUS SPINOSA

(Prunus. s.)

Botanical name : *Prunus spinosa* Linn. **Family**: Rosaceae

Common names : *English*: Black thorn; *French*: Epinenoire; *German*: Schlehdorn.

Description : A dense shrub, up to 4 m in height, branches spiny, bark blackish; young twigs usually pubescent. Leaves 2 to 4 cm, obovate to oblanceiolate, finely crenate or serrate, cuneate at the base, dull green and glabrous above but usually pubescent on the veins beneath. Flowers numerous, mostly solitary appearing before the leaves; pedicels 5 mm glabrous, petals 5 to 8 mm, white. Fruit 13 to 15 mm, globose, erect whitish-black. Endocarp subglobose, smooth or slightly rugose.

Part used : Flower bud, just before flowering.

Identification : Evaporate to concentrate 10 ml of alcoholic extract (10 g of drug extract with 100 ml of 60 percent aqueous ethanol and extract the aqueous solution with 25 ml *chloroform*). Separate the *chloroform* layer with aqueous layer.

(i) Carry out TLC of *chloroform* extract on silica gel 'G' plate using *benzene : ethyl acetate* (95 : 5) as solvent system and saturated solution of *antimony trichloride* in *chloroform* as spray reagent. Two pink spots appear at the R_f 0.53 and 0.13.

(ii) Carryout the TLC on silica gel 'G' plate of aqueous portion of drug left in test No. 1, using *ethyl acetate : butanol : formic acid : water* (50 : 30 : 10 : 10) as solvent spots system, spray with 1 percent alcoholic *aluminium trichloride* solutions; three spots appear, at the R_f 0.71 (yellowish), 0.90 (brownish) and 0.97 (yellow).

(iii) Take a few drops of alcoholic extract and add pinch of *magnesium metal powder;* add 2 drops of concentrated *hydrochloric acid;* a reddish-pink colour is produced.

Distribution : Europe, America (New England to Pennsylvania).

History and authority : Proved and introduced by Whale, *Archiv.* XIV, 3, 169; Allen: *Encyclop. Mat. Med*., Vol. VIII, 157; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 887.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Prunus Spinosa in *coarse powder*	100 g
Purified Water	400 ml

Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2 x to contain one part Mother Tincture, three parts Purified Water, six parts of *Strong Alcohol;* 3x and higher with *Dispensing Alcohol.*

PTELEA TRIFOLIA
(Ptel. tri.)

Botanical name : *Ptelea trifoliata* Linn. **Family**: Rutaceae

Common names : *English*: Water ash; *German*: Hopfenbaum.

Description : A small tree, attaining height up to 3 m, with a straight trunk 15 to 30 cm in diameter. Leaves rarely opposite, trifoliate each of which consists of a fairy stout petiole (5 to 7 cm), bearing upon its extremity 3 sub-sessile, ovate to oblong; serrate leaflets; terminal leaflet usually larger than the other two. Flowers greenish-white, appear from March to June, in terminal compound cymes, having disagreeable odour. Fruit an orbicular samara, about 2 cm in diameter, the wing portion of each being membranous, reticulate and emerginate.

Part used : Bark.

Macroscopical : Irregular transversely curved pieces or in quills of variable size and 3 to 4 mm thick. Outer surface light brown with prominent broad, irregular, transverse, greyish-white lenticels and transverse ridges. Inner surface brownish-yellow and smooth; fracture short, broken surface appearing waxy and pale yellow. Odour faint and taste bitter and acrid.

Microscopical : Numerous layers of tangentially-elongated cork cells, the walls of which are nearly colour less and more or less lignified. Cork-cambium (phellogen) of delicate thin-walled cells, rich in protoplasm and exhibiting cross-walls. Many of the cells of this region possess solitary rhomboidal crystals of calcium oxalate. Several layers of stone cells forming a continuous sclerenchyma sheath. A broad cortex of tangentially-elongated parenchyma cells and intercellular air spaces. Some of the cortical parenchyma cells contain numerous spheriodal or ovate starch grains, while other contains rosette aggregates of calcium oxalate, starch grains are simple or 2 to 4 compound. Scattered about in the cortical and outer phloem regions are sclerenchyma fibres either isolated or in small groups. A broad phloem consisting of numerous phloem patches separated from each other by wavy phloem rays which are 1 to 5 cells wide seen in tangential section. Secretion sacs containing oil are found scattered in both cortex and phloem. Some of the intercellular air-spaces show rows of calcium oxalate crystals.

Distribution : Indigenous to America on rocky places.

History and authority : Introduced by Hale, *Tran. Am. Inst. Hom.* 1868; Allen: *Encyclop. Mat. Med.,* Vol. VIII, 177; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. VII, 903.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ptelea Trifolia on *coarse powder*	100 g
Purified Water	250 ml
Strong Alcohol	777 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, two parts of Purified Water and seven parts of *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VIII

RANUNCULUS BULBOSUS
(Ran. bulb.)

Botanical name : *Ranunculus bulbosus* Linn. **Family**: Ranunculaceae

Synonym : *Ranunculus speciosus* Hort.

Common names : *English*: Butter-cup; *French*: Renoncule; *German*: Hahnenfuss.

Description : Perennial, about 30 cm high; root a true bulb. Stem erect, hirsute. Leaves petioled broad-ovate, 3 to 5 parted terminal division petioluled, lateral sessile or nearly so, all variously lobed or cleft; peduncles sulcate. Flowers bright yellow, about 2.5 cm across. Sepals often reflexed; petals 5 to 7, much larger than the sepals, ovate, compressed, receptacle slightly villous. The whole plant is exceedingly acrid, raising blisters, sometimes followed by deep sloughing ulcers.

Part used : Whole plant.

Distribution : Europe, naturalised in United States, found in grassy fields and along road sides. Abundant in New England.

History and authority : Proved and introduced in 1821 by Franz. *Archiv*, Vol. II, 165; Allen: *Encyclop. Mat. Med.*, Vol. VIII, 257; Hering: *Guiding Symptom*, Vol. IX, 1.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ranunculus Bulbosus in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

RANUNCULUS SCELERATUS

(Renun. s.)

Botanical name : *Ranunculus sceleratus* Linn. **Family**: Ranunculaceae

Common names : *English*: Celery-leaved butter cup; *French*: Herbe sardonique; *German*: Gifthahnenfuss.

Description : An erect, glabrous, much branched, annual up to 70 cm in height. Leaves alternate, petiolate, simple, usually 3-partite, segments cuneate and again variously lobed or notched; cauline leaves sessile. Flowers bracteate, bisexual, numerous, in cymose inflorescence, sepals 5 and petaloid; petals 5, obovate, nectary present at the base of each petal; stamens many, polyandrous; receptacle hairy. Fruit achenes, many in an oblong head, small, rather turgid, not margined, obtuse or apiculate.

Part used : Whole plant excluding root.

Microscopical : Stem: in transverse section is circular in out line with a thin cuticle covering, the epidermis followed by multicellular cortex having air-cavities. Distinct hypodermis and cambium absent. Vascular bundles conjoint, collateral and closed, present in peripheral region, consisting of smaller and larger bundles, arranged alternately and surrounded by sclerenchyma. Pith is large, with central hollow region.

Leaf: dorsiventral covered with small, unicellular, thin-walled, glandular hairs. Stomata anomocytic.

Distribution : Found in wet patches in India, Asia, Europe and United States.

History and authority : Proved and introduced by Dr. Schreter, *Archiv. Hom*; Allen: *Encyclop. Mat. Med*., Vol. VIII, 270; Hering: *Guiding Symptoms*, Vol. IX.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Ranunculus Sceleratus, moist magma containing Solids 100 g, plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

SARRACENIA PURPUREA

(Sarr. pur.**)**

Botanical name : *Sarracenia purpurea* Linn. **Family**: Sarraceniaceae

Common names : *English*: Common pitcher plant; *French* and *German*: Sarracenie.

Description : An acaulescent perennial herb, with hollow radical leaves, usually provided with a lid of expanded blade, forming a pitcher with a wing or keel on one side. Pitchers ascending in rosettes of 3 to 6, 5 to 25 cm long, widest towards middle, narrowed below and upward, green to dark purple; lid upright or slightly inclined outward with fine hispid hairs over its inner attractive surface; wing broad, prominent. Flowers 3 to 4.5 cm wide; sepals and petals greenish-purple to purple.

Part used : Whole plant.

Microscopical : Root: primary structure pentarch. Surface bounded by hypodermis with thickened walls and brown contents; cortex spongy with abundant intercellular spaces, endodermis of small cells with scarcely thickened walls; xylem arranged in ten large groups. Metaxylem consists of trachieds, food-storing cells and large vessels with oblique, scalariform septa.

Rhizome: Epidermis with brown pigment in the cell cavities; bounded internally by 2 to 3 layers of hypodermis, the outer cells being lignified, cortex broad; vascular bundles collateral of varying size, shape and arranged in discontinuous ring and separated by parenchyma. Bundles bounded internally and externally by sclerenchyma; xylem containing a few vessels with spiral thickenings and more numerous vessels with scalariform perforations.

Petiole: exhibits irregular crescent of collateral vascular bundles, each bounded internally and externally by sclerenchyma but embedded in loose starch containing parenchymatous tissue, the starch grains being far numerous in some of the cells than the others. Demarcation between the outer ring of bundles and the scattered ones toward the center is not very clear. Two sets of bundles present in the laminar wing with fewer xylem groups inwardly directed.

Distribution : United States and Canada.

History and authority : Introduced and proved by Porcher, Dunjan and Thomes; Allen: *Encyclop. Mat. Med.,* Vol. VIII, 514; Hering: *Guiding Symptoms,* Vol. IX, 222.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sarracenia Purpurea in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

STICTA PULMONARIA
(Sticta p.)

Botanical name : *Lobaria pulmonaria* (L.) Haffm. **Family**: Stictaceae

Common names : *English*: Lungwort; *French*: Pulmonaire de Chene; *German*: Lungenkraut.

Description : A lichen with thallus medium sized to large, up to 50 cm in size, irregularly laciciate lobate, lobes truncate at apices, dorsal surface greyish-green, yellow-brown, when dry remarkably scrobivulate and strongly reticulate, ridged, coarsely and often isidiate along ridged portions, ventral surface dark brown and densely tomentose in grooves between node and pale swelling, rhizome dark brown, 2 mm long, simple or tufted.

Part used : Whole lichen.

Microscopical : Consists of dorsal cortex 3.5 cm thick, para-plectenchymatous, composed of cells with large (7 µm) lumina, algal layer 40 µm thick, medullar 200 to 300 µm thick; lower cortex 25 µm thick para-plectenchymatous, densely tomentose. Apothecia on ridges and on margins, 2 to 4 mm in diameter, strongly constricted at base, substipitate, disc reddish-brown, margins entire; epithecium 10 µm thick, hymenium 90 to 100 µm thick, spores colourless or pale brown, 3 septa at maturity, fusiform, 26 to 32 x 7 to 12 µm in size.

Distribution : Europe, Northern America and Asia.

History and authority : Proved and introduced by S. C. Burdick, *N.A.J. Hom.* XIV, 202 (in 1863); Allen: *Encyclop. Mat. Med.*, Vol. IX, 167.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Sticta Pulmonaria in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

SYPHILLINUM
(Sypphil.)

Microbiological name : *Treponema pallidum* Sehaudinn & Heffmann, 1905.

History and authority : Proved by Sam'l Swan; Allen: *Materia Medica of* Nosodes, 449; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1344.

Biological distribution : Organism present in large number in syphilitic lesion.

Source for the preparation of homoeo drug : Syphilitic lesion in primary or early secondary stage.

Morphology : Thin, delicate spirochaete with tapering ends. Its length varies from 4 to 14 µ and its breadth is about 0.2 µ. It contains a number of regular primary spirals, which appear rather sharp and angular and each of which is a little over 1 µ in length. During motion secondary curves may appear and disappear in rapid succession, but the primary spirals remain undisturbed. The organism is actively motile. The organisms stain rose red with *Giemsa.* They are held back by gradocol membranes having a pore size of 0.4 µ; thin narrowest diameter is therefore 0.2 µ.

Cultural characteristic: Successful method of culture in vitro still awaits discovery. It can be maintained for study only in experimental animals (rabbits, mice etc).

Resistance : Very susceptible to heat. Saline suspensions of infected rabbit testical are sterilised by exposure to 39º for 5 hours, 40º for 3 hours and 41º for 2 hour and 41.5° for 1 hour. Dies out rapidly in stored blood, unless frozen, so that the chances of transmitting syphilis with stored blood plasma or serum are very small (Selbic. 1943).

Preparation : (a) Group N-IV: Proceed according to General Instructions for preparation of nosodes at, H.P.I., Vol. IV,

(b) Trituration 1x — Drug strength 1/10

Syphilinum	1.0 g
Saccharum Lactis	9.00 g

to make 10 grammes of the trituration.

(c) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x to be stored at a temperature about 5º.

Caution : (a) Not be dispensed below 6x.

(b) 6x should be free from live germ and should pass the test for sterility as mentioned in Drugs Act.

TEUCRIUM MARUM VIRUM

(Teuc. m. v.)

Botanical name : *Teucrium marum* Linn. **Family**: Labiatae (Lamiaceae)

Common names : *English*: Cat thyme; *French*: Germandree Maritime; *German*: Katzenkraut.

Description : A small evergreen shrub; branches glabrous below and pubescent above. Leaves opposite, entire, petioled, ovate, acute, downy beneath, bright green. Flowers pale or purplish appear from July to September, in one sided axillary racemes.

Part used : Whole plant.

Identification : Alcoholic extract 10 g drug is extracted with 100 ml 60 percent *alcohol* is evaporated on water-bath to remove alcohol then extract with *chloroform.* Separate the two layers.

(1) Carry out the TLC of chloroform layer over silica gel 'G' plate using *toluene : acetone : acetic acid* (100 : 3 : 0.07) as mobile phase and *saturated solution of antimony trichloride in chloroform* as spray reagent. Heat the plate 105°. Four spots with R_f value 0.1 (brown), 0.18 (violet), 0.3 (violet) and 0.45(violet) are developed.

(2) Carry out the TLC of chloroform extract over silica gel 'G' plate using *benzene* as mobile phase and *saturated solution of antimony trichloride in chloroform* as spray-reagent; on heating the plate 105° three spots at R_f 0.12 (light brown), 0.23 (light brown) and 0.42 (brown spot) are developed.

(3) Carry out the TLC of aqueous layer over silica gel 'G' plate using *toluene : chloroform : acetone* (40 : 25 : 35) as mobile phase and 1 percent *ethanolic aluminium chloride solution* as spray reagent, heat at 105°. Two spots appear at R_f 0.43 (light brown) and at 0.9 (light brown).

Description : Spain, indigenous to Southern Europe.

History and authority : Proved and introduced by Dr. Stapf *Beltraege Zur Reiven Argnm,* 346; Allen: *Encyclop. Mat. Med.* Vol. VI, 167; Hering: *Guiding Symptoms,* Vol. VII, 285.

Preparation : (a) Mother Tincture — Drug strength 1/10

Teucrium Marum Virum in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

TUBERCULINUM
(Tuberc.)

Microbiologicl name : *Mycobacterium tuberculosis var. hominis* Koch. 1882.

History and authority : Proved and introduced by Nebel; Clarke: *A Dictionary of practical Mat. Med.*, Vol. III, 1461.

Biological distribution : Organism present in Tubercular lesions; usually in human lungs.

Source for the preparation of homoeo drug : Tuberculinum is made from cultured bacilli from human tubercular lesion.

Morphology : Rod shaped organism, 14 µ long and 0.2 to 0.8 µ broad, straight or slightly curved, with parallel or irregular sides and rounded ends; arranged singly or in small clumps; non-motile, non-sporing and non-capsulated. Fail to stain with simple dyes except after prolonged exposure. Stain best with hot carbol fuehsin; resist decolorisation with 25 percent *sulphuric acid* and with absolute *alcohol* for 40 minutes. Gram positive; staining may be even or granular; beaded forms are common. In animal body the bacilli are larger than in culture. Non acidfast and clubbed forms are not uncommon in culture.

Cultural characteristic: *In coagulated ex serum*: 4 weeks, 37º, thin effuse confluent greyish-yellow growth, with a finely granular surface, looking like a ground glass, colour may be golden yellow; consistency friable; emulsifies with great difficulty.

In Dorset egg: 4 weeks, 37º, rather poor, discrete or confluent, slightly raised, greyish-yellow growth, with a finely granular surface.

Resistance and metabolism : Cultures live for 4 to 8 weeks, as a rule, but may remain viable for a year. *Bacilli* are killed by moist heat at 60º in 15 to 20 minutes. In the excised tissues kept at 37º they die in about a week. In dried sputum most of *bacilli* die in a few days, are fairly susceptible to sunlight and Ultra-Violet light. Growth occurs between pH 4.5 and 8.0, optimum pH is 6.4 to 7.4. Optimum temperature 37º; very little growth, if any, below 30º. Growth occur best in an aerated medium in presence of 5 percent *carbon dioxide*; no growth under strictly anaerobic condition. Growth is improved by addition of *glycerine, glucose* or dead acid fast *bacilli* to the medium; and is said to improve by substances rich in vitamin B, by chick embryo extract.

Biochemical : No acid produced in sugar media. Gives positive reactions in the niacin neutral red and *nitrate reduction test,* but a negative reaction in the *Tween 80 hydrolysis* and *aryl sulphatase tests.* Forms

abundant *catalase* and *peroxidase*. Produces *amidases* from *urea*, *nicotinamide* and *pyrazinamide*.

Preparation : (a) Under Class II, as suspension consisting of twenty billion germs per ml is obtained. Proceed according to General Instructions for preparation of Nosodes' Group N-11 to obtain IX.

(b) Trituration 2x — Drug strength 1/100

Membrane from Tuberculosis	10 g
Saccharum Lactis	90 g

to make 100 grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparation below 6x to be stored at a temperature about 5º and allowed not to freeze.

Caution : Handle with care and follow aseptic condition upto 6x.

TUSSILAGO FARFARA

(Tuss. far.)

Botanical name : *Tussilago farfara* Linn. **Family**: Compositae (Asteraceae)

Common names : *Hindi*: Watpan; *English*: Celtsfoot; *French*: Pasd'ane; *German*: Huffattigblatter.

Description : A white-wooly scapiferous herb; leaves radical, slightly fragrant, long-petioled, cordate-orbicular, 7.5 to 25.0 cm broad, lobed and toothed or palmate, appearing after flowering, white-tomentose beneath; heads bright yellow; 40 central staminate and tubular florets surrounded by about 300 pistillate florets with very narrow, bright yellow ligulate corolla, having rounded apices without teeth; heterogamous with ray and disc-florets; achenes 5 to 10 ribbed; pappus soft, snow-white. Rhizomes horizontal with many fibrous roots.

Part used : Whole plant.

Macroscopical : Rhizomes small, spreading white. Leaves usually broken and folded together, when entire. Petiole long and pubescent; lamina broadly ovate-reniform; nearly orbicular or cordate from 8 to 25 cm in length and up to 25 cm in breadth, rounded or acute at apex, deeply cordate at the base, angularly lobed and dentate with red-brown teeth along the margin, palmately 5 to 9, upper surface dull greyish-green, nearly-glabrous, lower surface white tomentose. Flower heads, bright yellow; peduncles simple about 4 to 15 cm long and bear numerous, linear, entire, reddish bracts up to 1 cm long and cottony-hairs each terminating in a small, dark red gland. Flowers and leaves are odourless; flowers are tasteless but leaves mucilaginous and bitter in taste.

Microscopical : Leaf: covered with abundant, characteristic slender clip-like uniseriate hairs, each composed of 3 to 6 short cells and a very narrow terminal cell which often attains a length of about 0.8 mm. Epidermal cells wavy-walled and striated; palisade cells in 3 or 4 rows; numerous stomata on both surfaces. Fruit also crowned with a pappus of colourless barbed bristles, 3 to 4 cells wide.

Distribution : Found Himalayas from Kashmir to Nepal at 1,500 to 3,500 m.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1470.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Tussilago Farfara in *coarse powder*	100 g
Purified Water	530 ml
Strong Alcohol	500 ml

to make on thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

URTICA URENS

(Urt. u.)

Botanical name : *Urtica urens* Linn. **Family**: Urticaceae

Common names : *English*: Dwarf nettle; *French*: Ortie griech; *German*: Brennessel.

Description : An annual herb, erect, simple or branched, up to 60 cm, glabrous except for numerous stinging hairs. Leaves long-petioled, elliptic to broadly ovate and blunt or rounded in general outline, deeply incised-serrate, the teeth triangular, acute; upper leaves usually larger than the lower. Stipules oblong, 1 to 3 mm long. Flowers in oblong clusters, usually shorter than the subtending, petioles mostly unbranched usually shorter male and female in the same panicle.

Part used : Whole plant.

Microscopical : Leaf: dorsiventral, epidermis single layered; stomata anomocytic on lower epidermis only; cystolith in upper epidermal cells as crystalline yellowish mass, sometimes as a compact dumbel; cystolith bearing epidermal cells extending deep in palisade; palisade 1 to 2 layered; spongy parenchyma 4 to 5 cells wide. Mid-rib pronounced abaxially, while slightly depressed adaxially, vascular bundle conjoint and collateral; ground tissue of loose, irregular parenchyma cells; collenchyma absent. Leaf (powder): consists of anomocytic stomata; characteristic stinging hairs with a broad multicellular base; numerous simple unicellular trichomes with circular oval base; crystalline mass of cystolith; stomatal index 16.6 to 20.0 for lower epidermis; spiral vessels.

Stem: rectangular, wavy in outline, with a single layered epidermis beset with stinging hairs; epidermal cells with abaxial and adaxial thickenings; cortex, 3 to 4 cells wide with large irregular tangentially elongated parenchyma cells; bands of thick-walled sclerenchymatous wide lumened cells just below the cortex; phloem in a ring. Secondary xylem with deep ridges in the pith and consist of vessels, wide sclerenchymatous conjunctive tissue with intraxylary parenchyma at places and air cavities. Primary xylem present; pith large, with loose, irregular, parenchyma cells, air cavities aggregates of calcium oxalate crystals. In longitudinal section, consist of oblong, parenchymatous cortical cells in 3 to 4 layers; thick-walled, wide-lumened sclerenchyma cells below the cortex; spiral reticulate vessels, reticulate with bordered pits; abundant conjunctive tissue interspersed with xylem vessel; conjunctive tissue of thick-walled lignified fibres and cells; bands of intraxylary parenchyma cells, being oblong and tangential; pith with large oval, isodiametric parenchyma cells and air-cavities, aggregates of calcium oxalate. Stem (powder) consist of stinging hairs with pointed end and broad base; sieve tubes, spiral reticulate vessels, reticulate vessel with bordered pits; abundant conjunctive

tissue of sclerenchymatous cells being thin-walled, notched at one end and taper at other end; oval, rectangular parenchyma cells long thick-walled tapering narrow lumened sclerenchymatous fibres.

Root: epidermis 2-layered, cortex 4 to 5 layered of oblong irregular parenchyma cells; phloem 4 to 5 layered; xylem, a wide cylinder containing vessels, abundant lignified conjunctive tissue and bands of interxylary parenchyma; scattered aggregate of calcium oxalate crystals in xylem. Root (powder): consist of abundant large oval parenchyma cells; thick-walled narrow lumened fibres with taper ends; thin-walled sclerenchyma fibres with simple, reticulate pits from conjunctive tissue, simple pit fibres with tailing ends; vessels, scleriform and reticulate.

Distribution : Europe especially U.K., Germany and Austria.

History and authority : Introduced by Fiard in 1936: *Allg. Hom. Zeit.* (8) (81) (6); Allen: *Encyclop. Mat. Med.,* Vol. X, 47; Hering: *Guiding Symptoms,* Vol. X, 362.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Urtica Urens in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

VINCA MINOR
(Vinc. min.)

Botanical name : *Vinca minor* Linn. **Family**: Apocynaceae

Common names : *English*: Lesser periwindle; *French*: Pervenche; *German*: Kleines Sinngrun.

Description : Hardy evergreen, trailing herb, up to 1 m long with creeping rootstock. Leaves glossy dark-green, ovate, oblong-ovate or elliptic lanceolate not more than 3 to 5 cm long, glabrous; petiole very short with 2 glands at the top; flower stalks erect, sometimes nearly 30 cm high. Flowers lilac blue; calyx lobes lanceolate rather obtuse, glabrous; corolla-lobes 5, small, cuneate, obtuse and truncate, the tube 8 to 12 mm long, limb 2 to 3 cm wide, twisted in bud; stamens 5, enclosed in the corolla tube; ovary bicarpellary, glabrous; follicles 2, erect or divergent, narrowly cylindrical.

Part used : Whole plant.

Identification : (1) Take 1 ml of the alcoholic extract (1 g in 10 ml of *alcohol*) in a test tube, add 2 drops of dilute *acetic acid or* dilute *hydrochloric acid;* a yellow precipitate is produced.

(2) Take 1 ml of the alcoholic extract (1 g in 10 ml of *alcohol*) in a test tube, add 2 drops of *sodium hydroxide* solution; a light yellow colour is produced.

Distribution : Commonly grown in gardens in cooler places in India.

History and authority : Proved and introduced in 1838 by Posenber *A.H.Z.* 17, 41; Allen: *Encyclop. Mat. Med.,* Vol. X, 128; Hering: *Guiding Symptoms,* Vol. X, 468; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1544.

Preparation : (a) Mother Tincture ϕ — Drug Strength 1/10

Vinca Minor in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	800 ml

to make on thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

VIOLA ODORATA

(Viola od.)

Botanical name : *Viola odorata* Linn. **Family**: Violaceae

Common names : *Hindi*: Banafsha; *English*: Sweet scented violet; *French*: Violette odorante; *German*: Veilchen.

Description : A small herb, tufted, somewhat pubescent, producing long prostrate stolons; flowering in the second year; root stock short. Leaf cordate-ovate to renifrom, obtusely serrate, stipules ovate-lanceolate, acuminate, the fringed border usually not glandular. Flower pedicels arise from the axils of the leaves and bear single flower, with pair of scaly bracts, a little above the midrib of the stalk; deep purple (violet), fragrant, petals 5, unequal, the lower one lengthened into a hollow spur beneath and the lateral petals with a hairy central line. Anthers united in tube round the 3-celled capsule, the lower two furnished with spurs which are enclosed within the spur of the corolla.

Part used : Whole plant.

Microscopical : Leaf: epidermal cells sinuous, stomata anisocytic and trichomes unicellular; xylem vessels, scalariform with both end tailing; sclerenchyma with simple pits; secretory ducts rectangular parenchymatous cells; aggregates of calcium microcrystals.

Stem: xylem vessels with scalariform, spiral and simple pits; sclerenchyma fibres large with simple circular pits and tapering at both ends; abundant parenchymatous cells, sieve tubes and companion cells; unicellular trichomes tapering above and with broad circular base bearing micro hairs. Trachieds with reticulate thickenings; aggregates of calcium oxalate microcrystals; sclereids absent.

Distribution : Kashmir from 1500 to 2000 m. Cultivated in other hill areas.

History and authority : Introduced by Gross and proved by Gross and Hahnemann: *Archiv. Jur. Hom.* Vol. VIII, 182; Allen: *Encyclop. Mat. Med.*, Vol. X, 130; Hering: *Guiding Symptoms*, Vol. X, 472.

Preparation : (a) Mother Tincture ϕ Drug Strength 1/10

Viola Odorata, moist magma containing solids 100 g, plant moisture 350 ml	450 g
Strong Alcohol	685 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

VIOLA TRICOLOR
(Viola t.)

Botanical name : *Viola tricolor* Linn. **Family**: Violaceae

Common names : *English*: Pansy; *French*: Fleur de la Trinite; *German*: Ackeveitchen.

Description : A herb, glabrous or nearly so. Stem long and branched. Leaves basal cordate or round-cordate, those of stem ovate-oblong or lanceolate, all stalked and crenate-dentate; stipules large, pinnetely parted towards the base. Flower large, usually three coloured, the spur usually twice as long as the appendages of the calyx. When strayed from cultivation flowers become small and loose markings characteristic of the hybrid.

Part used : Whole plant.

Microscopical : Powder: fragments of wavy epidermal cells with paracytic and anisocytic stomata; palisade and spongy parenchyma cells; tracheids with spiral and annular thickenings, vessels with bordered and simple pits; sieve tubes with companion cells, unicellular thick-walled hairs pointed at the apex and arising from single basal cell with minute projections, elongated rectangular parenchyma cells; crystals of calcium oxalate.

Distribution : Cultivated throughout India.

History and authority : Proved by Hahnemann *Archiv Jour Hom.* III (2) 173; Allen: *Encyclop. Mat. Med.*, Vol. X, 132; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1550.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Viola Tricolor, moist magma containing solid 100 g, plant moisture 300 ml	400 g
Purified Water	100 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*. 3x and higher with *Dispensing Alcohol.*

APPENDICES

APPENDIX—I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Acetic Acid : Of the H.P.I., Vol. I.

Acetic Acid, Dilute : Of the H.P.I., Vol. I.

Acetone : Of the H.P.I., Vol. III.

Alcohol (95% V/V) : Of the H.P.I., Vol. I.

Alcohol (90% V/V) : Dispensing Alcohol of H.P.I., Vol. I.

Alcohol (80% V/V) : Contains 79.5 to 80.3 percent of *Alcohol* (V/V). Dilute 842 ml of *Alcohol* to 1000 ml with *water*, specific gravity: At 25°, 0.840 to 0.842, H.P.I., Vol. I. Refractive index at 25°, 1.3608 to 1.13619, H.P.I., Vol. I.

Alcohol (20% V/V) : Contains 19.5 to 20.5 percent of alcohol (V/V). Dilute 210 ml of *alcohol* to 1000 ml of with *water*, specific gravity: at 25°, 0.968 to 0.970, H.P.I. Vol. I. Refractive index at 25°, 1.340 to 1.342, H.P.I. Vol. I.

Lizarin (Mordant Red II) : $C_{14}H_8O_4$.
Description : Orthorhombic orange needles by sublimation or from absolute alcohol.
Solubility : Slightly soluble in boiling *water*, moderately soluble in *alcohol*, freely soluble in hot *methanol* and in *ether*.
Melting range : 289° to 291°, H.P.I., Vol. I.
Boiling range : 429° to 431°, H.P.I., Vol. I.

Aluminium : Of the H.P.I., Vol. III.

Aluminium Chloride : $AlCl_3. 6H_2O$
Contains not less than 98.0 percent of $AlCl_3. 6H_2O$
Description : A white, crystalline powder.
Solubility : Soluble in *water*.
Iron : 2.0 g complies with the *limit test for iron*, H.P.I., Vol. I.
Sulphate : 0.5 g complies with the *limit test for sulphates*, H.P.I., Vol., I.
Assay : Dissolve 0.3 g in 35 ml of *water*, add 15 ml of *dilute nitric acid*, 5 ml of *dibutylpthalate*, add 50 ml of 0.1 N silver nitrate and shake for 1 minute. Add 5 ml of *ferri-ammonium sulphate solution* and titrate with 0.1 N *ammonium thiocyanate* until a reddish brown colour is obtained, which after shaking, does not fade in five minutes. Each ml of 0.1 N *silver nitrate* is equivalent to 0.008038 g of $AlCl_3. 6H_2O$.

Aluminium Chloride Alcoholic solution of : A 1.0 percent w/v solution of aluminium chloride in *alcohol* (of the H.P.I., Vol. II).

Aluminium Chloride, Aqueous solution of : A 1.0 percent w/v solution of aluminium chloride in *water*.

Ammonia Solution (10% w/w) : Ammonia solution dilute of the H.P.I., Vol. I.

Ammonia Strong Solution : AMMONIUM CAUSTICUM of the H.P.I., Vol. I.

Ammonium Carbonate, Solution of : Of the H.P.I., Vol. I.

Ammonium Chloride : AMMONIUM MURIATICUM of the H.P.I., Vol. I.

Ammonium Chloride, Solution of : A 10.0 percent w/v solution of ammonium chloride in water.

Ammonium Chromate : $(NH_4)_2\ CrO_4$
Contains not less than 98.0 percent of $(NH_4)_2\ CrO_4$.
Description : yellow crystals or granular.
Solubility : Soluble in *water*.
Assay : Weigh accurately about 1.2 g, dissolve in *water* and dilute to 200 ml. Transfer 20 ml into a glass stoppered flask, dilute with 130 ml of *water* and add 7 ml of *hydrochloric acid* and 3 g of *potassium iodide*, allow to stand for 15 minutes, then titrate the liberated iodine with 0.1 N *sodium thiosulphate*, using *starch* toward the end. Correct for a blank. Each ml of 0.1N sodium thiosulphate is equivalent to 0.005070 g of $(NH_4)_2\ CrO_4$.

Ammonium Chromate, Solution of : A 5.0 percent w/v solution of *ammonium Chromate* in *water.*

Ammonium Ferric, Sulphate : Of H.P.I., Vol. I.

Syn. : Ferric ammonium sulphate

Ammonium Ferric Sulphate solution of : Syn. : Ferric ammonium sulphate solution. A 10.0 percent w/v solution of *Ferric ammonium sulphate* in *water*.

Ammonium Hydroxide, Solution of : Of the H.P.I.,Vol. I.

Ammonium Molybdate, Solution of : Of the H.P.I., Vol. I.

Ammonium Nitro : To a solution of 125 g of *moylbdic acid* in mixture of 80 ml of

Molybdate, Solution of — *ammonia solution* and 320 ml of *water* add a solution of 400 g of *ammonium nitrate* in sufficient *water* to produce 100 ml followed by a mixture of 380 ml of *nitric acid* and 620 ml of *water*. Allow to stand for 24 hours at about 35° and filter.

Ammonium Oxalate, Solution of : Of the H.P.I., Vol. I.

Ammonium Persulpahte : Of the H.P.I., Vol. III.

Ammonium Sulphate : **(**$NH_4)_2$ SO_4
Contains not less than 98.0 percent of **(**$NH_4)_2$ SO_4.
Description : Colourless crystals or white granules.
Solubility : Very soluble in *water*; insoluble in *alcohol*.
Chloride : 3.5 g complies with the *limit test for chlorides*, H.P.I., Vol. I.
Sulphated ash : Not more than 0.1 percent, H.P.I., Vol., I.

Anaesthetic Ether : **(**$C_2H_5)_2O$
Anaesthetic ether is purified diethyl ether. It contains a suitable stabiliser in a proportion not greater than 0.0002 percent w/v.
Description : Colourless, transparent, very mobile liquid; odour, characteristic; taste, sweet and burning. Very volatile and inflammable.
Solubility : Soluble in *water;* miscible with *alcohol* and with *chloroform*.
Boiling Range : 34° to 35°, H.P.I., Vol. I.
Wt. per ml : 0.7130 to 0.7145 g (at 20°), H.P.I., Vol. I.
Peroxides : Place in a stoppered tube of about 12 ml capacity and about 1.5 cm in diameter, 8 ml of *solution of potassium iodide* and *starch*, fill to brim with sample of Anaesthetic ether, and place the stopper in position, so that no air bubble is enclosed, shake vigorously and set aside in the dark for 30 minutes; no brown or reddish colour is produced.
Non-volatile matter : 50 ml when evaporated and dried to constant weight at 105°, leaves not more than 1 mg of residue.

Aniline : $C_6H_5NH_2$
Description : Colourless or pale yellow, oily liquid; odour characteristic.
Solubility : Soluble in *water;* miscible with *alcohol, beneze* and *ether*.
Boiling range : 183° to 186°, H.P.I., Vol. I.
Ignition residue : Evaporate 20 ml and ignite to constant weight, the residue does not exceed 1.0 mg.

Aniline phthalate : Mix 0.93 g of *aniline* with 1.66 g of *phthalic acid* and dissolved in 100 ml *n-butanol* saturated with water.

Antimony Trichloride : $SbCl_3$
Contains not less than 98.0 percent of $SbCl_3$.
Description : Colourless crystals, fuming in moist air.

Solubility : Very soluble in dehydrated alcohol and in chloroform.
Assay : Dissolve 0.5 g in 30 ml of *water* containing 4 g of *potassium sodium tartrate* add 2 g of *sodium hydrogen carbonate* and titrate with 0.1 N iodine. Each ml of 0.1 N iodine is equivalent to 0.114 g of $SbCl_3$.

Antimony Trichloride Saturated Solution of : A saturated solution of *Antimony trichloride* in *chloroform*.

Aqua regia : Of the H.P.I., Vol. I.

Benzene : Of the H.P.I., Vol. III.

Bismuth Nitrate : Of the H.P.I., Vol. III.

Boric Acid : H_3BO_3
Boric acid contains not less 99.5 percent of H_3BO_3 calculated with reference to the substance dried over *concentrated sulphuric acid* for five hours.
Description : White crystals of a somewhat pearly luster or a white crystalline powder. Taste, slightly acidic and bitter, touch unctuous. Heated at 100°, it loosed water and is partially transformed into metaboric acid HBO_2 solubility.
Solubility : Soluble in *water* and in *alcohol*, freely soluble in boiling *water* and in boiling *alcohol*.
Identification (i) : Acidify a 5.0 percent w/v solution with *hydrochloric acid*; moisten a piece of turmeric paper with the solution and dry; the colour of the paper becomes pink or brownish red, pour *dilute ammonia solution* or *solution of sodium hydroxide* on the paper; the colour changes to blue or greenish black.
(ii) Ignite in a porcelain dish, a solution in alcohol, it is tinched green.

Assay : Weigh accurately about 2 g and dissolve in a mixture of 50 ml of water and 100 ml of glycerin, titirate with 1N *sodium hydroxide*, using *solution of phenolphthalein* as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.1638 g of H_3BO_3.

Boric acid Aqueous Solution of : A 5.0 percent w/v solution of boric acid in *water*.

Bromine Solution of : Of H.P.I., Vol. I.

Buffer Solution : Of H.P.I., Vol. III.

n-Butanol : C_4H_9OH
Description : A clear, colourless liquid.
Solubility : Soluble in *water*.

Boiling Range : Not less than 95.0 percent distils between 115° and 118°, H.P.I., Vol. I.
Wt. per ml : At 25°, about 0.81 g, H.P.I., Vol. I.
Fluorescence : when examined under screened ultraviolet light, it shows no fluorescence.
Non-volatile matter : When evaporated to dryness on a water-bath and dried to constant weight at 105°, leaves not more than 0.01 percent w/v of residue.

Calcium Carbonate : CALCARIA CARBONICA of the H.P.I., Vol. I..

Calcium Sulphate, Semihydrate : $CaSO_4$. $½H_2O$
Description : A white powder; odourless and tasteless.
Solubility : Slightly soluble in *water*, practically insoluble in *alcohol*.
Identification : See CALCAREA SULPHURICA of the H.P.I., Vol. I.

Calcon : $C_{20}\ H_{13}\ N_2\ NaO_5\ S$
Description : A brownish-black powder with a violet sheen.
Solubility : Sparingly soluble in *water*, freely soluble in *alcohol* and in *acetone*. Very soluble in *methanol.*

Calcon Triturate : Triturate 1 part of *Calcon* with 99 parts of freshly ignited sodium *chloride*.
Test for sensitivity : Dissolve 0.2 g in 5 ml of *water*. To 1 ml of the solution add 50 ml of *water*, 10 ml of 1 N *sodium hydroxide* and 1 ml of a 1 percent w/v *solution of magnesium sulphate*. The solution is blue. On addition of 0.1 ml of a 0.15 percent w/v *solution of calcium chloride*, the solution becomes violet and on the subsequent addition of 0.1 ml of .01 M *sodium edetate*, turns to pure blue.

Carbon Disulphide : Of the H.P.I., Vol. I.

Carbon Tetrachloride : Of the H.P.I., Vol. I.

Chloroform : $CHCl_3$
Chloroform is trichloromethane.
Description : A colourless volatile liquid; odour, characteristic; taste, sweet and burning.
Solubility : Slightly soluble in *water;* freely miscible with *ethyl alcohol* and with *solvent ether*.
Wt. per ml : At 25°, 1.4738 to 1.4742 g; H.P.I., Vol. I.
Boiling range : 60° to 62°, H.P.I., Vol. I.
Acidity : Shake 10 ml with 20 ml of freshly boiled and cooled *water* for three minutes and allow to separate. To a 5 ml portion at the aqueous layer add 0.1 ml of *solution of litmus*; the colour produced is not different from that produced on adding 0.1 ml of solution of litmus to 5 ml of freshly boiled and cooled *water*.

Non-volatile matter : 25 ml, when evaporated and dried to constant weight at 105°, leaves not more than 1 mg of residue.

Chloroplatinic Acid (Hexa) : See Platinic Chloride.

Citric Acid : $C_6H_8O_7H_2O$

It contains not less than 99.5 percent and not more than the equivalent of 101.0 percent $C_6H_8O_7H_2O$.

Description : Colourless, translucent crystals or a white, crystalline powder slightly hygroscopic in moist air; slightly efflorescent in warm dry air; odourless, taste, strongly acidic.

Solubility : Very soluble in *water;* freely soluble in *alcohol* and slightly soluble in *solvent ether*.

Identification : Yields, when neutralised, the reactions characteristic of *citrates*, H.P.I., Vol. II.

Copper and *Iron :* Dissolve 2 g in 40 ml of *water* and add 10 ml of *dilute ammonia solution* and 5 drops of *solution of sodium sulphide*; the colour produced is at most slightly deeper than that produced in a similar mixture, containing in addition 1 ml of *solution of potassium cyanide*.

Assay : Weigh accurately about 3g and dissolve in 100 ml of *water* and titrate with 1 N *sodium hydroxide* using *solution of thymol blue* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.07005 g of $C_6H_8O_7H_2O$.

Copper : Of the H.P.I., Vol. I.

Cupric Sulphate : $CuSO_4.\ 5H_2O$

Copper sulphate contains not less than 98.5 percent and not more than the equivalent of 101.0 percent of $CuSO_4.\ 5H_2O$.

Description : Blue triclinic prisms or a blue crystalline powder.

Solubility : Soluble in *water*, almost insoluble in *alcohol*, very slowly soluble in *glycerine.*

Identification : Yields the reactions characteristic of *copper*, H.P.I., Vol. I and of *sulphates*, H.P.I., Vol. I.

Acidity and clarity of solution : 1 g dissolved in 20 ml of *water*, forms clear blue solution, which becomes green on the addition of 0.1 ml of *solution of methyl orange.*

Assay : Weigh accurately about 1 g and dissolve in 50 ml of *water;* add 3 g of *potassium iodide*, 5 ml of *acetic acid* and titrate the librated iodine with 0.1 N *sodium thiosulphate,* using *solution of starch* as indicator. Continue titration till faint blue colour remains, add 2 g of *potassium thiocyanate*, stir well and continue the titration until the blue colour disappears. Each ml of 0.1 N *sodium thiosulphate,* is equivalent to 0.02497 g of $CuSO_4.\ 5H_2O$.

Cupric Sulphate, Aqueous Solution of : A 1.0 percent w/v solution of *cupric sulphate* in *water*.

Devarda's Allay : It consists of 50 parts of *copper*, 45 parts of *aluminium* and 5 parts of *zinc*.
Description : Grey powder.
Solubility : Partly soluble in hydrochloric acid.

Disodium Edetate : Of the H.P.I., Vol. I.

Dragendorff's Reagent : For alkaloids and other nitrogen containing compounds.
Solution A : 1.7 g basic bismuth nitrate and 20 g tartaric acid are dissolved in 80 ml water.
Solution B : 16 g potassium iodide dissolved in 40 ml water.
Stock Solution—A 1:1 (v/v) mixture of A and B is prepared.
Spray reagent : 5 ml of stock solution are added to a solution of 10 g *tartaric acid* in 50 ml *water*.

Ether : $(C_2H_5)_2O$
It is diethyl ether.
Description : A colourless, transparent, very mobile liquid, odour, characteristic, taste, sweet and burning; very volatile and inflammable. Mixture of its vapour with oxygen, air or nitrous oxide in certain concentrations are explosive.
Solubility : Soluble in water, miscible with *alcohol* and with *chloroform*.
Boiling Range : 34° to 35°, H.P.I., Vol. I.
Wt. per ml. : At 25°, 0.704 to 0.708 g, H.P.I., Vol. I.
Peroxides : Place in a stoppered tube of about 12 ml capacity and about 1.5 cm in diameter 8 ml of *solution of potassium iodide* and *starch*. Fill to the brim with the sample and place the stopper in position so that no air bubble is enclosed, shake, vigorously and set aside in the dark for thirty minutes, no brown or reddish colour is produced.
Non-volatile matter : 50 ml when evaporated and dried to constant weight at 105° leaves not more than 1 mg of residue. It is dangerous to perform this test if the sample does not comply with the test for peroxides.

Ethyl Acetate : $C_2H_5COOCH_3$
Description : A colourless liquid; odour, characteristic.
Solubility : Soluble in *water*, miscible with *alcohol* and with *solvent ether*.
Boiling range : Not less than 95.0 percent, distils between 74° and 79°, H.P.I., Vol. I.
Wt. per ml : At 25°, 0.895 to 0.898 g H.P.I., Vol. I.
Non-volatile matter : when evaporated to dryness on a water-bath and dried to constant weight at 105°, leaves not more than 0.01 percent w/v of residue).

Boric Ammonium Sulphate : Of the H.P.I., Vol. I.

Boric Chloride : Of the H.P.I., Vol. I.

Solution of Ferrous Sulphate : Of the H.P.I., Vol. III.

Formaldehyde, solution : Formaldehyde solution is a solution of *formaldehyde* in *water* with *methyl alcohol* added to prevent polymerisation. It contains not less than 34.0 percent w/w and not more than 38.0 percent w/w of CH_2O.

Description : A colourless liquid; odour, characteristic pungent and irritating; taste, burning. A slight white cloudy deposit is formed on long standing especially in the cold due to separation of paraformaldehyde. This white deposit disappears on warming the solution.

Solubility : Miscible with water and with alcohol.

Identification (i) : Dilute 2 ml with 10 ml of *water* in a test tube and add 1 ml of *solution of silver ammonium nitrate;* metallic silver is produced either in the form of a finely divided, grey precipitate or as a bright metallic mirror on the sides of the test tube.

(ii) Add 2 drops to 5 ml of *sulphuric acid* in which about 20 mg of salicylic acid has been dissolved and warm the liquid very gently; a permanent deep red colour appears.

Acidity : To 10 ml add 10 ml of *carbon dioxide-free water* and titrate with 0.1 N *sodium hydroxide* using *solution of bromothymol blue* as indicator; not more than 5 ml of 0.1 N *sodium hydroxide* is required.

Wt. per ml : At 25°, 1.076 to 1.080 g, H.P.I., Vol. I.

Assay : Weigh accurately about 3 g and to a mixture of 50 ml of solution of hydrogen peroxide and 60 ml of 1 N sodium hydroxide, arm on a water-bath until effervescence ceases; titrate the excess of alkali with 1 N sulphuric acid, using solution of phenolphthalein as indicator. Repeat the experiment with the same quantities of the same reagents in the same manner omitting formaldehyde solution. The difference between the titrations represent the sodium hydroxide required to neutralise the formic acid produced by the oxidation of the formaldehyde. Each ml of 1N *sodium hydroxide* is equivalent to 0.03003 g of CH_2O.

Formic Acid : HCOOH

Contains not less than 90.0 percent w/w of CH_2O_2.

Description : A colourless liquid having a very pungent odour. Highly caustic.

Solubility : Miscible with water and with alcohol.

Wt. per ml : At 25°, about 1.2 g, H.P.I., Vol. I.

Chloride : 1 ml complies with the *limit test for chlorides*, H.P.I., Vol. I.

Sulphate : 0.5 ml complies with the *limit test for sulphates*, H.P.I., Vol., I.

Non-volatile matter : When evaporated on a water-bath and dried to constant weight at 105° leaves not more than 0.05 percent w/w of residue.
Assay : Weigh a flask containing about 10 ml of *water*, quickly add about 1 ml of the acid and re-weigh; dilute with 50 ml of water and titrate with 1 N sodium hydroxide, using solution of phenolphthalein as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.04603 g of CH_2O_2.

Glucose : $C_6H_{12}O_6H_2O$
Description : Colourless crystals or a white or cream coloured, crystalline or granular powder; odourless; taste, sweet.
Solubility : Freely soluble in *water* and slightly soluble in *alcohol*.
Identification (i) : When heated, it melts, swells up and burns, evolving an odour of burnt sugar.
(ii) When heated with *potassium cupri-tartarate solution*, it produces a copious precipitate of cuprous oxide.
Acidity : 5.0 g dissolved in 50 ml of freshly boiled and cooled *water;* requires for neutralisation not more than 0.2 ml of 0.1 N *sodium hydroxide, phenolphthalein solution* being used as indicator.
Specific optical rotation : Determined in a solution prepared by dissolving 10 g in 50 ml of *water*, adding 0.2 ml of *dilute ammonia solution* and sufficient water to produce 100 ml and allow to stand for thirty minutes, +52.5 to +53.0, H.P.I., Vol. III.
Less soluble sugars and Dextrins : 1.0 g dissolves in 30 ml of boiling alcohol (90 percent) forming a clear solution which does not yield any deposit on cooling.
Loss on drying : When dried to constant weight at 105°, loses not less than 7.0 percent and not more than 10.0 percent of its weight.

Glycerin : Of the H.P.I., Vol. III.

Hydrochloric acid : ACIDUM MURIATICUM, of the H.P.I., Vol. I.

Hydrochloric Acid, Dilute : Dilute hydrochloric acid contains 10 percent w/w of Hydrochloric acid.
Wt. per ml. : At 25°, 1.04 to 1.05 g, H.P.I., Vol. I.

Hydrochloric acid (5 percent w/v) : It contains 5 percent w/v of Hydrochloric acid

Hydrogen peroxide (30 percent) : Of the H.P.I., Vol. I.

Hydrogen peroxide Solution of : Of the H.P.I., Vol. I.

Hydrogen sulphide Solution of : Of the H.P.I., Vol. I.

Iodoplatinate (spray reagent) : 5 ml of 5.0 percent hexa chloroplatinic acid and 45 ml of 10 percent aqueous potassium iodide solution are mixed and diluted to 100 ml with water. The mixture is freshly prepared before use.

Lead : Of the H.P.I., Vol. I.

Lead Solution : Standard lead solution of the H.P.I., Vol. I.

Lead Acetate : $(CH_3COO)_2$ Pb. $3H_2O$
It contains not less than 99.5 percent and not more than the equivalent of 104.5 percent of $(CH_3COO)_2$ Pb. $3H_2O$.
Description : Small white, transparent, monoclinic prisms, crystalline masses; odour acetous; taste, sweet and astringent.
Solubility : Freely soluble in *water* and in *glycerine*, soluble in *alcohol*.
Identification : Yields the reactions characteristic of *lead*; H.P.I., Vol. I and of acetates; H.P.I., Vol. I.
Water insoluble matter : Dissolve 1 g in 10 ml of recently boiled and cooled *water;* a solution is produced which is, at most, faintly opalescent and becomes clear on the addition of one drop of *acetic acid*.
Assay : Weigh accurately about 0.3 g and dissolve in a mixture of 5 ml of *acetic acid* and 100 ml of *water*, heat on a water-bath to 85°, add 5 ml of *solution of potassium chromate* and continue the heating for half an hour. Collect the precipitate wash with hot *water* until the washings are colourless and dry to constant weight at 120°. Each g of residue is equivalent to 1.174 g of $(CH_3\ COO)_2$ Pb. $3H_2O$.

Lead Monoxide : PbO.
Contains not less than 98.0 percent of PbO.
Description : Yellow or orange-yellow powder.
Solubility : Almost insoluble in *water;* soluble in *nitric* or *acetic acid* and warm solutions of *alkali hydroxides*.
Assay : Weigh accurately about 0.3 g and dissolve in 5 to 10 ml of *water* and minimum quantity of *acetic acid.* Add 50 ml of *water*, about 50 mg of *xylenol orange* reagent and sufficient *hexamine* until the solution becomes red. Titrate with 0.05 M *sodium acetate* until the red colour becomes yellow. Each ml of 0.05 M *sodium acetate* is equivalent to 1.101 mg of PbO.

Magnesium Powder : Mg
Description : Silvery white powder.
Solubility : Soluble in dilute acids and solutions of ammonium salts, slightly soluble in hot *water;* insoluble in cold *water*.

Iron : To 2.0 ml of *magnesium solution* add 2 ml of *hydrochloric acid* and 50 mg of *ammonium thiocyanate*, the resulting red colour is not darker than that of a blank to which 0.015 mg of iron has been added.

Magnesium, Solution S : Place 2.5 g of the *Magnesium Powder* in a 300 ml Erlen meyer flask, add 50 ml of *water* then add through a funnel in the neck of the flask 2-3 ml of *hydrochloric acid at* a time, allow the reaction to subside before adding the next portion of the acid (about 20 ml of the acid will be required). No insoluble residue remains. Dilute the solution to 100 ml.

Magnesium Uranyl Acetate:Of the H.P.I., Vol. III.

Mercuric Chloride : Of the H.P.I., Vol. I.

Mercuric Nitrate : $Hg(NO_3)_2\ H_2O$

Contains not less than 99.0 percent of $Hg(NO_3)_2.\ H_2O$.

Description : Colourless or slightly coloured, hygroscopic crystals.

Solubility : Soluble in *dilute nitric acid*.

Non-volatile matter : Moisten 2 g with *sulphuric acid* and ignite; not more than 1 mg of residue is obtained.

Assay : Dissolve 0.5 g in 100 ml of *water* containing 5 ml of *nitric acid.* Titrate with 0.1 N *ammonium thiocyanate*, using 5 ml of *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *ammonium thiocyanate* is equivalent to 0.01713 g of $Hg(NO_3)_2.H_2O$.

Methyl Alcohol : CH_3OH

Description : A clear, colourless liquid with a characteristic odour.

Solubility : Miscible in all proportions with *water*, forming a clear, colourless liquid.

Specific gravity : At 25°, not more than 0.7 to 1.0, H.P.I., Vol. I.

Boiling range : Not more than 95.0 percent distils between 64.50 and 65.5, H.P.I., Vol. I.

Refractive index : A 25°, 1.40, H.P.I., Vol. I.

Acetone : Place 1 ml in a Nessler glass, add 19 ml of *water*, 2 ml of a 1 percent w/v solution of *O-nitrobenzaldehyde* (50 percent) and 1 ml of a 30 percent w/v solution of sodium hydroxide and allow to stand in the dark for fifteen minutes. The colour developed does not exceed that produced by mixing 1 ml of standard solution *acetone*, 19 ml of *water*, 2 ml of *solution of O-nitrobenzaldehyde* and 1 ml of a 30 percent w/v solution of sodium hydroxide.

Acidity : To 5 ml add 5 ml of *carbon dioxide-free water* and titrate with 0.1 N *sodium hydroxide*, using *solution of bromothymol blue* as indicator. Not more than 0.1 ml is required.

Non-volatile matter : When evaporated on water-bath and dried at 105°, leaves not more than 0.005 percent w/v of residue.

Nickel Sulphate : $NiSO_4. 6H_2O$
Contains not less than 98.0 percent of $NiSO_4. 6H_2O$.
Description : Emerald green crystals.
Solubility : Soluble in *water*, almost insoluble in *alcohol*.
Assay : Weigh accurately about 1.5 g, dissolve in *water* and dilute to 200 ml. Transfer 50 ml to a 500 to 600 ml beaker and dilute with *water* to 200 ml. Add 1 g of *sodium citrate*, heat to boiling, then add to the boiling solution, with stirring, a solution of 0.6 g of *dimethyl glyoxime* in 100 ml of warm *alcohol*, follow with 5 ml of *ammonium hydroxide* and let stand overnight. Filter on a gooch crucible wash with hot *water*, then with 50 percent *alcohol* and dry at 110° to constant weight. The weight of the nickel dimethyl'glyoxime multiplied by 0.910 is equivalent to $NiSO_4.6H_2O$.

Nickel Sulphate, Solution of : A 5.0 percent w/v solution of *Nickel sulphate* in *water*.

Nitric Acid, Dilute : Of the H.P.I., Vol. I.

O-Nitro Benzaldehyde : Of the H.P.I., Vol. I.

O-Nitro Benzaldehyde Solution of (50%) : A 50.0 percent w/v solution of *O-nitro benzaldehyde* in *alcohol.*

Oxalic Acid : ACIDUM OXALICUM of the H.P.I., Vol. III.

Oxalic acid, solution of : A 5.0 percent w/v solution of oxalic acid in *water*.

Paraffin Liquid : Liquid paraffin is a mixture of liquid hydrocarbon obtained from petroleum. Tocopherol is not more than 10 parts per million may be added as a stabiliser.
Description : A transparent, colourless, oily liquid, free or nearly free from fluorescence by day light; odourless and tasteless, when cold and develops not more than a faint odour of petroleum, when heated.
Solubility : Practically insoluble in *water* and in *alcohol*; soluble in c*hloroform*, in *solvent ether* and in volatile oils.
Wt. per ml : At 25°, 0.860 to 0.904 g, H.P.I., Vol. I.
Kinetic viscosity : At 37. 8°, not less than 64 centistokes.
Reaction : Boil 5 g with 10 ml of *alcohol* previously neutralised to *solution of litmus*, the alcohol is neutral to *solution of litmus*.
Solid Paraffin : Place a suitable quantity, previously dried by heating at 100° for two hours and cooled in a dessicator over *sulphuric acid* in a glass cylindrical vessel. Close the vessel and immersed it in a mixture of ice and water, the liquid is

sufficiently clear after four hours and that a black line, 0.5 mm in width, held vertically behind the vessel can be easily seen.

Perchloric Acid (60 percent w/w) : An aqueous solution containing not less than 59.0 percent w/w of $HClO_4$.
Description : A clear, colourless liquid.
Solubility : Miscible with *water* in all proportions.
Assay : Titrate about 4 g, accurately weighed and diluted with 50 ml of *water*, with 1 N *sodium hydroxide* using *solution of phenolphthalein* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.005 g of $HClO_4$.

Petroleum Ether : *Description :* A colourless, very volatile, highly inflammable liquid, obtained from petroleum, consisting of a mixture of the lower members of the paraffin series of hydrocarbons and complying with one or other of the following definitions :-
Light Petroleum (40° to 60°)
Wt. per ml : At 25°, 0.627 to 0.645, H.P.I., Vol. I.
Light petroleum (60° to 80°)
Wt. per ml : At 25°, 0.665 to 0.684, H.P.I., Vol. I.
Non-volatile matter : when evaporated on a water-bath and dried to constant weight at 105° leaves not more than 0.002 percent w/v of residue.

Phenolphthalein : Of the H.P.I., Vol. I.

Phosphoric Acid : ACIDUM PHOSPHORICUM of the H.P.I., Vol. I.

Phthalic Acid (Ortho) : $C_8H_6O_4$
Description : Crystalline; when rapidly heated forming phthalic anhydride and water.
Solubility : Slightly soluble in *water and in ether;* freely soluble in *alcohol*; insoluble in *chloroform.*
Melting range : 229° to 231°, H.P.I., Vol. I.

Picric Acid : ACIDUM PICRICUM of the H.P.I., Vol. II.

Picric Acid, Aqueous solution of : A solution of *water* containing approximately 1 : 0 percent w/v of *picric acid*.

Platinic Chloride : $H_2PtCl_6.6H_2O$
Contains not less than 40.0 percent of Pt.
Description : Brownish yellow, crystalline masses rapidly deliquescent.
Solubility : Very soluble in *water* or *alcohol*.
Assay : Weigh accurately about 1 g and dissolve in 20 ml *water* and 10 ml of a *saturated solution of ammonium chloride*, cover and allow to stand overnight. Filter, wash the precipitate with 20 ml of *saturated ammonium chloride solution*, dry, ignite

carefully and weigh. The residue is the platinum content of sample taken.

Platinum : Of the H.P.I., Vol. I.

Potassium Antimonate : $KSbO_3$. $3H_2O$.
Contains not less than 40.0 percent of Sb.
Description : A white crystalline powder.
Solubility : Soluble in *water*.
Assay : Dissolve about 0.3 g accurately weighed, in 100 ml of *water* and 2 ml of *dilute hydrochloric acid* and pass *hydrogen sulphide* until the antimony is completely precipitated. Add 2 ml of *hydrochloric acid* and again pass *hydrogen sulphide*. Boil, filter, wash the precipitate with hot *water* saturated with *hydrogen sulphide* and dissolve the precipitate in 25 ml of *hydrochloric acid*. Boil to remove *hydrogen sulphide* and dilute to 50 ml with *water*. Add 2 g of *sodium potassium tartarate*, neutralise carefully with *sodium carbonate* and titrate with 0.1N *iodine*, using *solution of starch* as indicator. Each ml of 0.1N *iodine* is equivalent to 0.006088 g of Sb.

Potassium Antimonate, Solution of : Boil 2 g of *potassium antimonite* with 95 ml of *water* until dissolved. Cool rapidly and add 50 ml of solution of *potassium hydroxide* and 5 ml of 1N *sodium hydroxide*. Allow to stand for 24 hours, filter and add sufficient water to produce 150 ml.
Sensitivity : to 10 ml add 7 ml of 0.1 N *sodium chloride*; a white crystalline precipitate is formed within 15 minutes.

Potassium Dichromate Aqueous Solution of : Of the H.P.I., Vol. I.

Potassium Bromate : $KBrO_3$.
Contains not less than 99.5 percent of $KBrO_3$ calculated with reference to the substance dried to constant weight at 105°.
Description : A white, crystalline powder.
Solubility : Soluble in *water;* freely soluble in boiling *water;* insoluble in *alcohol*.
Reaction : A 5.0 percent w/v solution in *water* is clear and colourless and neutral to *solution of litmus*.
Assay : Dissolve 1 g in *water* and dilute to 250 ml. To 25 ml of this solution add 3 g of *potassium iodide* and 10 ml of *hydrochloric acid,* dilute with 100 ml of *water* and titrate with 0.1 N *sodium thiosulphate*. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.002783 g of $KBrO_3$.

Potassium Bromide : KBr
Contains not less than 98.0 percent of KBr.
Description : Colourless, transparent or opaque, crystals or a white granular powder; odourless; taste, saline and faint bitter.
Solubility : Freely soluble in *water* and *glycerine*. Slightly soluble in *alcohol*.

Identification : Yields the reactions characteristic of *potassium*, H.P.I., Vol. I and of *bromides*; H.P.I., Vol. III

Alkali : Dissolve 5 g in 50 ml of freshly boiled and cooled *water* and add 0.2 ml of 0.1 N *sulphuric acid*; no colour is produced on the addition of a drop of *solution of phenolphthalein*.

Loss on drying : Loses not more than 1.0 percent of its weight when dried to constant weight at 105°.

Assay : Weigh accurately about 0.4 g and dissolve in 40 ml of *water* and 5 ml of *nitric acid*. Add 50 ml of 0.1N *silver nitrate* and 5 ml of *nitrobenzene* and shake. Titrate with 0.1 N *ammonium thiocyanate*, using solution *of ferric ammonium sulphate* as indicator, shaking vigorously as the end point is approached. Correct for the amount of chloride present. Each ml of 0.1 N *silver nitrate* is equivalent to 0.0119 g of KBr.

Potassium Bromide Solution of : A 5.0 percent solution of *potassium bromide* in *water*.

Potassium Chromate, Solution of : Of the H.P.I., Vol. I.

Potassium Cyanide, Solution of : Of the H.P.I., Vol. I.

Potassium Ferrocyanide, Solution of : Of the H.P.I., Vol. I.

Potassium Hydroxide : KOH

Potassium hydroxide contains not less than 85.0 percent of total alkali; calculated as potassium hydroxide. It contains not more than 4.0 percent of K_2CO_3.

Description : Dry, white sticks, pellets or fused mass; hard, brittle and showing a crystalline fracture; very deliquescent, strongly and corrosive.

Solubility : Soluble in *water, alcohol* and in *glycerin*.

Identification : Gives the reactions characteristic of *Potassium*, H.P.I., Vol. I.

Assay : Weigh accurately about 2 g and dissolve in 25 ml of *water*, add 5 ml of *solution of barium chloride* and tittate with 1N *hydrochloric acid* using *solution of phenolphthalein* as indicator. To the solution of flask and solution of *bromophenol blue* and continue the titration with 1N *hydrochloric acid*. Each ml of 1N *hydrochloric acid* used in the second titration is equivalent to 0.06911 g of K_2CO_3. Each ml of 1N *hydrochloric acid* used in the combined titration is equivalent to 0.05611 g of total alkali calculated as KOH.

Potassium Iodide : KALI IODATUM of the H.P.I., Vol. I.

Potassium Iodide, Solution, of : Of the H.P.I., Vol. I.

Potassium Nitrate : Of the H.P.I., Vol. III.

Potassium Permanganate : $KMnO_4$.
It contains not less than 99.0 percent of $KMnO_4$.
Description : Dark purple, slender, prismatic crystals, having a metallic luster; odourless; taste, sweet and astringent.
Solubility : Soluble in *water*; very soluble in boiling *water*.
Identification (i) : A solution in *water*, acidified with *sulphuric acid* and heated to 70°, is decolourised by *solution of hydrogen peroxide.*
(ii) Heated to redness, it decrepitates, evolves oxygen and leaves a black residue which with *water* forms potassium hydroxide solution; the resulting solution when neutralised with *dilute hydrochloride acid* gives the reactions characteristic of *potassium*, H.P.I., Vol. I.
Assay : Weigh accurately about 0.8 g, dissolve in *water* and dilute to 250 ml. Titrate with this solution 25 ml of 0.1 N *oxalic acid* mixed with 25 ml of *water* and 5 ml of *sulphuric acid*. Keep the temperature at about 70° throughout the entire titration. Each ml of 0.1 N oxalic acid is equivalent to 0.00316 g of $KMnO_4$.

Resorcinol : $C_6H_6O_2$
Contains not less than 99.0 percent of $C_6H_6O_2$.
Description : White or slightly yellowish-white. Crystalline powder with a faint, characteristic odour. Gradually turns pink on exposure to light and air.
Solubility : Very readily soluble in *water* and 95.0 percent *alcohol* readily soluble in *ether;* soluble in *glycerol* and fixed oils. Very slightly soluble in *chloroform*.
Identification (i) : Add 3 drops of *ferric chloride solution* to 10 ml of a 1 : 200 solution of the substance; a blue-violet colour appears which changes to brownish-yellow on addition of *ammonia solution*.
(ii) Fuse several crystals of the substance in a porcelain dish with an excess of *phthalic anhydride*, a yellowish red melt is produced. When the melt is dissolved in *sodium hydroxide* an intense green fluorescence appears.
Melting range : 109° to 112°, H.P.I., Vol. I.
Acidity or alkalinity : Add one drop of bromophenol blue to 10 ml of the solution of resorcinol (1:200). The colour changes on the addition of more than 0.1 ml of 0.2 N sodium hydroxide or hydrochloric acid.
Assay : Place about 0.2 g of the substance (accurately weighed in a 100 ml measuring flask, dissolve in 20 ml of water and fill the flask with water to the mark. Transfer 20 ml of the resultant solution to a 250 ml bromination flask, add 40 ml of 0.1N potassium bromate solution and 10 ml 50 % sulphuric acid, mix

and allow to stand per 15 minutes then add 20 ml of potassium iodide solution to the mixture, shake vigorously and allow to stand for 10 minutes in a dark place. Add 2 to 3 ml of chloroform and titrate the liberated iodine with 0.1 N sodium thiosulphate solution. Ran a blank test under the same condition. Each ml of 0.1 N sodium thiosulphate is equivalent to 0.001835 g of $C_6H_6O_2$, the content of which in the substance is not less than 99.0 percent.

Rhamnose : $C_6H_{12}O_5$
Description : Occurs in two forms α and β—α-form always obtained by crystallisation from water or alcohol. Monohydrate, holohedric rodes from water hemihedric monoclinic columns from alcohol. Very sweet test.
β-form : prepared by heating, α-rhamnose monohydrate on a steam bath; crystallised from anhydrous acetone and alcohol.
Melting range : α-form, 82° to 92°, H.P.I., Vol. I.
β-form, 122° to 126°, H.P.I., Vol. I.

Salicylic acid : ACIDUM SALICYLICUM of the H.P.I., Vol. II.

Saline Solution : Saline solution contains 0.9 percent w/v of *sodium chloride*, sodium chloride 9 g and *water for injection*, sufficient to produce 1000 ml. Dissolve, filter and immediately sterilise by heating in an autoclave or by filtration.
Identification : Yields the reactions characteristic of *sodium*; H.P.I., Vol. I and of *chlorides*, H.P.I., Vol. I.
Pyrogens : complies with the *test for pyrogens*.
Reaction : pH 4.5 to 7.0.
Assay : Carry out the assay described under NATRUM MURIATICUM, H.P.I., Vol. I.

Silica Gel G : Normally it contains about 13 percent of *Calcium sulphate hemihydrate*.
Description : A fine, white, homogeneous powder of an average particle size between 10 and 40 μm. Shake 1 g for 5 minutes with 10 ml of *carbondioxide free water*. The pH of the suspension is about 7.0; H.P.I., Vol. I.
Appearance of thin layer : Coated as a thin layer silica gel G shows homogeneous dispersion.
Adhesive power : Prepare a chromatographic plate, coated with silica gel G and dry it in an oven. Spray on to the plate a vertical jet of air of 1 mm diameter at a pressure of 2 atmospheres. The first particles of the gel should not be detached from the plate until the jet is at a distance not greater than 3 cm.
Chromatographic Separation : Apply on a layer of silica gel G 10 μl respectively of 0.01 percent w/v solutions in *benzene of indophenol blue, sudan red and dimethyl yellow*. Develop with the same solvent over a path of 10 cm. The migration time is about 20 minutes. The chromatogram shows three clearly

separated spots, the spot of indophenol blue near the starting point, that of dimethyl yellow in the middle of the *chromatogram* and that of sudan red between the two.
Calcium Sulphate : Place about 0.25 g, accurately weighed, in a flask with a ground glass stopper, add 3 ml of *dilute hydrochloric acid* and 100 ml of water and shake vigorously for half an hour. Filter through a sintered glass and wash the residue. Take the filtrate and washings, titrate with 0.05 M *disodium edetate* to within a few ml of expected end point, add 4 ml of *concentrated sodium hydroxide solution* and 0.1 g of *calcon triturate* and continue the titration until the colour changes from the pink to a full blue colour. Each ml of 0.05 M sodium edetate is equivalent to 7.26 mg of calcium sulphate hemihydrate.

Silver Nitrate, Solution of : Of the H.P.I., Vol. I.

Sodium Bicarbonate : $NaHCO_3$.
Contains not less than 98.0 percent of $NaHCO_3$.
Description : A white, crystalline powder or small, opaque, monoclinic crystals; odourless; taste, saline.
Solubility : Soluble in *water;* practically insoluble in *alcohol*.
Reaction : pH of a 1 percent w/v solution, not greater than 8.6.
Assay : Weigh accurately about 1 g and dissolve in 20 ml of *water* and titrate with 0.5 N *sulphuric acid*, using *solution of methyl orange* as indicator. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.042 g of $NaHCO_3$.

Sodium Carbonate, Anhydrous : Na_2CO_3
Contains not less than 98.0 percent of Na_2CO_3.
Description : A white powder.
Solubility : Soluble in *water*.
Sulphate : Dissolve 2 g in 3 ml of *hydrochloric acid* and 50 ml of *water*, add 1 ml of *solution of barium chloride* and allow to stand for one hour; no turbidity is produced.
Assay : Dissolve about 3 g, accurately weighed in 50 ml of *water* and titrate with 1 N *hydrochloric acid* using solution of *methyl-orange* or *solution of bromophenol blue* as indicator. At the first colour change, boil the solution, cool and complete the titration. Each ml of 1 N *hydrochloric acid* is equivalent to 0.053 g of Na_2CO_3.

Sodium Chloride : NATRUM MURIATICUM Of the H.P.I., Vol. I.

Sodium Diethyl dithio-carbamate Solution of : Of the H.P.I., Vol. III.

Sodium Hydroxide : Of the H.P.I., Vol. III.

Sodium Hydroxide solution of : Of the H.P.I., Vol. I.

Sodium Hydroxide, 10 percent Solution : A 1.0 percent w/v solution of *sodium hydroxide* in water.

Sodium Hydroxide, 30 percent Solution : A 30 percent w/v solution of sodium hydroxide in water.

Sodium Nitrite : NATRUM NITRICUM of the H.P.I., Vol. IV.

Sodium Sulphate : NATRUM SULPHURICM of the H.P.I., Vol. I.

Sodium Sulphate, Anhydrous : Of the H.P.I., Vol. III.

Sodium Sulphide Solution of : Of the H.P.I., Vol. I.

Sodium thiosulphate : $Na_2S_2O_3.5H_2O$.
Contains not less than 99.0 percent of $Na_2S_2O_3.5H_2O$.
Description : Colourless, transparent, monoclinic, prismatic crystals; odourless; taste, saline.
Solubility : Freely soluble in water; practically insoluble in *alcohol*.
Identification : Yields the reactions characteristic of *sodium*; H.P.I., Vol. I and of *thiosulphates*; H.P.I., Vol. I.
Reaction : A 10.0 percent w/v solution is neutral or faintly alkaline to litmus.
Assay : Weigh accurately about 1 g and dissolve in 20 ml of *water* and titrate with 0.1 N *iodine*. Each ml of 0.1 N iodine is equivalent to 0.02482 of $Na_2S_2O_3.5H_2O$.

Starch : $(C_6HO_{10}D_5)$ n
Description : A fine, white powder or irregular, angular masses, readily reducible to powder; odourless.
Maize starch : Consists of polyhedral or rounded granules, about 5 to 30 microns in diameter and exhibiting in the center a distinct cavity or two to five rayed cleft.
Potato Starch : Consists principally of simple, granular, irregularly ovoid subspherical, often somewhat flattened, 30 to 100 microns subspherical granules, 10 concentric to 35 microns, in diameter; hilum, a point near the narrower end; striations, well marked, compound granules.
Rice Starch : Consists of simple and compound granules; single granules, polyhedral about 2 to 12 microns in diameter and sometimes exhibiting a minute central hilum; compound granules, ovoid, usually about 12 to 30 microns in length and 7 to 12 microns in width.
Wheat Starch : Consists principally of simple, lenticular granules, outline circular, oval or subreniform; smaller granules, 5 to 10 microns, large granules 20 to 25 microns in diameter, hilum a point near the narrower end; striations, faintly marked, concentric; compound granules.

Solubility : Practically insoluble in cold *water* and in *alcohol*.
Identification : Boil with 15 times its weight of water and cool; a transparent viscous fluid or jelly is produced which is deep blue coloured by *solution of iodine;* the colour disappears on warming and reappears on cooling.
Acidity : Add 10 g to 100 ml of *alcohol* (70 percent) previously neutralised to *solution of phenolphthalein*, shake well during one hour, filter and titrate 50 ml of the filtrate with 0.1 N *sodium hydroxide*, using *solution of phenolphthalein* as indicator; not more than 2 ml of 0.1 N *sodium hydroxide* is required.
Ash : Not more than 0.3 percent (maize starch), 0.3 percent (potato starch), 0.6 percent (rice starch), 0.3 percent (wheat starch); H.P.I., Vol. I.
Loss on drying : Loses not more than 14 percent of its weight when dried to constant weight at 105° (for potato starch—loses not more than 20 percent of its weight when dried to constant weight at 105°).

Starch, Soluble : Starch, which has been treated with *hydrochloric acid* until, after being washed it forms an almost clear limpid solution in hot water.
Description : A fine white powder.
Solubility : Soluble in hot water, usually forming a slightly turbid solution.
Reaction : Shake 2 g with 20 ml of *water* for three minutes and filter; the filtrate is not alkaline or more than faintly acid to the litmus paper.
Sensitiveness : Mix 1 g with a little cold *water* and add 200 ml of boiling *water*. Add 5 ml of this solution to 100 ml of *water* and add 0.05 ml of 0.1 N *iodine.* The deep blue colour is discharged by 0.05 ml of 0.1 N *sodium thiosulphate.*
Ash : Not more than 0.3 percent, H.P.I., Vol. I.

Starch Solution of : Triturate 0.5 g of soluble starch with 5 ml of *water* and add this with constant stirring sufficient *water* to produce about 100 ml, boil for a few minutes; cool and filter. Solution of starch must be freshly prepared.

Sulphosalicyclic Acid : $C_7H_6O_6S$
Description : Dihydrate, white crystals or crystalline powder.
Solubility : Very soluble in *water* or *alcohol*; soluble in *ether*.
Melting range : 119° to 121°; H.P.I., Vol. I.

Sulphuric Acid : ACIDUM SULPHURICUM of the H.P.I., Vol. I.

Sulphuric Acid, Dilute : Dilute sulphuric acid contains not less than 9.5 percent and not more than 10.5 percent w/w of sulphuric acid.
Wt. per ml : at 25°, about 1.067 g, H.P.I., Vol. I.

Assay : Carry out the assay described under ACIDUM SULPHURICUM, H.P.I., Vol. I, using about 10 g accurately weighed.

Sulphuric Acid, Methanolic : A 5.0 percent v/v solution of *methanol* in *sulphuric acid*.

Sulphuric Acid Nitrogen free : Sulphuric acid which contains 96.0 percent w/w of H_2SO_4 and complies with the following addition at lest.
Nitrate : Mix 45 ml with 5 ml of water, cool and add 8 mg of *diphenyl benzidine*; the solution is colourless or not more than very pale blue.

Tartaric Acid : $C_4H_6O_6$
Contains not less than 99.0 percent of $C_4H_6O_6$.
Description : Colourless crystals or white powder.
Solubility : Soluble in *water and alcohol*.
Chloride : To a solution of 1 g in 20 ml of *water* and 1 ml of *nitric acid* and 1 ml of *silver nitrate*. No opalescence is produced.
Assay : Dry about 3 g of the powdered acid for 3 hours over an efficient desicant. Weigh accurately about 3 g of the dried reagent and dissolve it in 50 ml of *water*. Add 0.1 ml of *phenolphthalein solution* and titrate with 1N *sodium hydroxide*. Each ml of 1 N *sodium hydroxide* is equivalent to 0.07505 g of $C_4H_6O_6$.

Toluene : C_7H_8
Description : A clear, colourless, inflammable liquid.
Solubility : Insoluble in *water*; miscible with *ethyl alcohol*.
Boiling range : Not less than 95.0 percent distils between 109° to 111°, H.P.I., Vol. I.
Wt. per ml : At 25°, 0.870 g (approximately), H.P.I., Vol. I.

Trichloro Acetic Acid : CCl_3COOH
Description : Colourless, very deliquescent crystals or crystalline masses; odour pungent and characteristic.
Solubility : Very soluble in *water*, in *alcohol* and in *solvent ether*.
Identification : Decomposes with liberation of chloroform when warmed with a *solution of sodium hydroxide.*
Melting range : 55° to 57°, H.P.I., Vol. I.

Triethanol Amine : $(C_2H_4OH)_3N$
Description : Very hygroscopic, viscous liquid. Slight ammonical odour. Turns brown on exposure to air and light.
Solubility : Miscible with *water, methanol* and *acetone.*

Water Carbon dioxide Free : Of the H.P.I., Vol. I.

Water for injection : Distil potable water from a neutral glass or metal still fitted with an efficient device for preventing the entertainment of droplets. Reject the first portion of the distillate and collect the remainder in a suitable container. Immediately sterilise by heating in an autoclave or by filtration without the addition of a bacteriostatic.
Reaction : pH, 4.5 to 7.5.
Non-Volatile matter : Leaves not more than 0.003 percent w/v of residue when evaporated to dryness on a water-bath and dried to constant weight at 105°.
Pyrogens : Complies with the test for pyrogens.

Zinc Powder : Of the H.P.I., Vol. I.

Zinc Solution : To 2 g of zinc in a flask add 15 ml of *water* and 15 ml of *hydrochloric acid* and allow to stand or heat gently on a steam-bath until the zinc is nearly all dissolved. Then add 1 ml of *nitric acid* and boil gently until all is dissolved. Cool, dilute to 100 ml and mix well.

Zinc Sulphate : $ZnSO_4.7H_2O$
Description : Colourless or white crystals. Efflorescent in dry air.
Solubility : Soluble in *water;* slightly soluble in *glycerol*; insoluble in *alcohol*.
Reaction : Dissolve 2 g in 30 ml of *ether* and add 1 drop of *methyl orange*, no pink colour is produced.

Zinc Sulphate, Solution of : A 5.0 percent w/v solution of *zinc sulphate* in *water*.

APPENDIX—II

SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Acetic Acid, 1N, 2M, 6N : *Acetic acid* diluted with water to contain in 1000 ml, the following quantities of CH_3COOH.

1N	Of the H.P.I., Vol. III
For 2M	120.10 g CH_3COOH
For 6N	345.0 ml CH_3COOH

Ammonium Acetate, 3N : *Ammonium acetate* dissolved in *water* to contain in 1000 ml, the following quantities of NH_4COOCH_3.

For 3N	231 g NH_4COOCH_3.

Ammonium Nitrate, 9M : *Ammonium nitrate*, dissolved in *water* to contain in 1000 ml of the following quantities of NH_4NO_3.

For 9M	720,36 g NH_4NO_3

Ammonium Thiocyanate, 0.1 N : Of the H.P.I., Vol. I.

Disodium Edetate, 0.1N, 0.05 M : For 0.1 N, dissolve 37.2 g of *disodium edetate* in sufficient *water* to make 1000 ml & standardise the solution as follows :-

Weigh accurately about 0.2 g of *calcium carbonate*, transfer to a suitable container add 50 ml of *water* and sufficient *dilute hydrochloric acid* to dissolve the carbonate and dilute with *water* to 150 ml. Add 15 ml of *solution of sodium hydroxide*, 40 mg of *murexide indicator* preparation, 3 ml of *solution of naphthol green B* and titrate with *disodium edetate solution* until the solution is deep blue in colour. Calculate the molarity by the formula W/100.1v where w is the weight of $CaCO_3$ in sample of $CaCO_3$ taken and v is the volume in ml of *disodium edetate solution* consumed.

For 0.05 M	of the H.P.I., Vol. I

Ethylene Diamine Tetra Acetate, 0.1M : *Ethylene diamine tetracetate*, dissolved in *water* to contain in 1000 ml of the following quantities of EDTA :-

For 0.1 M	29.2 g EDTA

Hydrochloric Acid, 0.1 N, 0.02 N :

For 0.1 N	of the H.P.I., Vol. I.
For 0.02 N	of the H.P.I., Vol. III.

Iodine, 0.1 N, 0.02 N : *Iodine* and *potassium iodide*, dissolved in *water* to contain in 1000 ml, the following quantities of I & KI :-

For 0.1 N	of the H.P.I., Vol. I.
For 0.02 N	2..538 g I add 3,60 g KI.

Nitric Acid, 2N : *Nitric Acid* diluted with *water* to contain in 1000 ml, the following quantities of HNO_3.

For 2 N	126.02 g HNO_3.

Oxalic Acid, 0.1 N : *Oxalic acid*, dissolved in *water* to contain in 1000 ml, the following quantities of $H_2C_2O_4.H_2O$.

For 0.1 N	6.303 g $H_2C_2O_4.H_2O$

Perchloric Acid, 0.05 N : Cool 750 ml of *glacial acetic acid* to about 15° and add slowly, with continuous stirring, 6 ml of *perchloric acid* (60 percent w/v), adding 1 ml at a time so that the temperature does not rise. Cool the mixture to a temperature not lower than 10° but without freezing it and add an amount of *acetic anhydride* calculated to combine with the *water* in the perchloric acid. This addition is made drop-wise from a burette, the temperature being controlled so that it does not rise more than 0.5°. Allow the temperature to rise to 15° and add, with stirring sufficient *glacial acetic acid* to produce 1000 ml at 20°. Find out its exact strength by titrating with it with 50 ml of 0.1 N *sodium acetate* using 1 ml of *solution of α-naphthol benzene* as indicator.

Potassium Bromate, 0.1 N : *Potassium bromate*, dissolved in *water* to contain in 1000 ml.

For 0.1 N	2.784 g $KBrO_3$.

Potassium Iodate, 0.05 M : Of the H.P.I., Vol. I.

Potassium Permanganate, 0.1 N : Of the H.P.I., Vol. I.

Silver Nitrate, 0.1 N : Of the H.P.I., Vol. I.

Sodium Chloride, 0.1 N : *Sodium chloride* dissolved in *water* to contain in 1000 ml, the following quantities of NaCl :-

For 0.1 N	5.845 g NaCl.

Sodium Hydroxide, 2N : *Sodium hydroxide* dissolved in *water* to contain in 1000 ml, the

1 N, 0.5 N, 0.1 N, 0.05 N, 0.02 N, 0.01N

following quantities of *sodium hydroxide* :-

For 2 N	80.0 g NaOH
For 1 N	Of the H.P.I., Vol. I
For 0.5 N	20.0 g NaOH
For 0.1 N	Of the H.P.I., Vol. I
For 0.05 N	2.0 g NaOH
For 0.02 N	0.80 g NaOH
For 0.01 N	Of the H.P.I., Vol. I

Sodium Thio Sulphate, 0.1N, 0.02 N : *Sodium thio sulphate* dissolved in *water* to contain in 1000 ml, the following quantities of $Na_2S_2O_3.5H_2O$.

For 0.1 N	Of the H.P.I., Vol. I
For .02 N	4.804 g $Na_2S_2O_3.5H_2O$

Sulphuric Acid 1N, 0.5 N, 0.1 N, 0.02 N, : *Sulphuric acid* diluted with water to contain in 1000 ml, the following quantities of H_2SO_4.

For 1 N, 0.5 N & 0.1 N	Of the H.P.I., Vol. I.
For 0.02 N	0.9808 g H_2SO_4

APPENDIX—III

INDICATORS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Alizarin, solution of : A solution in *alcohol* approximately 1.0 percent w/v of *alizarin*.

Bromocresol Green, Solution of : Of the H.P.I., Vol. I.

Bromocresol purple, Solution of : Warm 0.1 g of *bromocresol purple* with 5 ml of *alcohol* (90 percent) until dissolved, add 100 ml of *alcohol* (20 percent), 3.7 ml of 0.05 N *sodium hydroxide* and sufficient *alcohol* (20 percent) to produce 250 ml.

Bromophenol Blue : Of the H.P.I., Vol. I.

Bromothymol Blue : Of the H.P.I., Vol. I.

Bromothymol Blue, Solution of : Of the H.P.I., Vol. I.

Crystal Violet, Solution of : Of the H.P.I., Vol. III.

Dimethyl Yellow : $C_{14}H_{15}N_3$

Description : Small yellow crystals or yellow or orange flakes.

Solubility : Practically insoluble in *water*, soluble in *chloroform* and in *benzene*, very slightly soluble in *alcohol*.

Indophenol Blue : *Description :* A violet, black powder.

Solubility : Practically insoluble in *water*, soluble in *benzene* and in *chloroform*.

Indigo Carmine, Solution of : A solution of *indigo carmine* in a mixture of 10 ml of *hydrochloric acid* and 990 ml of 20.0 percent w/v solution of *nitrogen free sulphuric acid* in *water*, adjusted to comply with the following test :-

Add 10 ml to a solution of 1.0 mg of *potassium nitrate* in 10 ml of *water*, add rapidly 20 ml of *nitrogen free sulphuric acid* and heat to boiling point; the blue colour is just discharged in one minute.

Leucomalachite Green, Solution of (1% w/v) : A 1.0 percent w/v solution of *Leucomalachite* green in *water*.

Litmus Solution : Of the H.P.I., Vol. I.

Magenta, Decolourised Solution : Of the H.P.I., Vol. III.

Methyl Red, Solution of : Of the H.P.I., Vol. I.

Methyl Orange, Solution of : Of the H.P.I., Vol. I.

Mordant Black : Of the H.P.I., Vol. III.

Murexide Indicator Preparation : Of the H.P.I., Vol. I.

Phenolphthalein, Solution of : Of the H.P.I., Vol. I.

Sudan Red : *Description :* A reddish brown powder.

Solubility : Practically insoluble in *water;* soluble in *chloroform* and in *benzene*.

Thymol blue : *Description :* A brown-green to green-blue crystalline powder.

Solubility : Slightly soluble in *water*, soluble in *alcohol* and in *dilute alkaline* solutions.

Thymol blue, Solution of : Warm 0.1 g of *thymol blue* with 4.3 ml of 0.05 N *sodium hydroxide* and 5 ml of *alcohol* (90 percent); after solution is effected, add a sufficient quantity of *alcohol* (20 percent) to produce 250 ml.

APPENDIX—VII

QUALITATIVE REACTIONS OF SOME COMMON SUBSTANCES AND RADICALS

Salicylates :

Salicylates char slowly on warming with *sulphuric acid*, evolving carbon monoxide and sulphur dioxide.

Salicylates heated with excess of *soda lime* evolve phenol, recognized by its characteristic odour and its inflammability.

Solutions of salicylates with *dilute hydrochloric acid* yield a crystalline precipitate of salicylic acid, soluble in *solution of ammonium acetate,* in solvent ether and in *chloroform.*

Neutral solutions of salicyclates give, with *solutions of ferric chloride,* an intense reddish violet colour, which remain on addition of a little *acetic acid*, but disappears on addition of *dilute hydrochloric acid,* a white crystalline precipitate of salicylic acid separating.

APPENDIX—XXII

DETERMINATION OF VISCOSITY

Viscosity is a property of a liquid which is closely related to the resistance to flow.

In C.G.S. system, the dynamic viscosity (η) of a liquid is the tangential force in dryness per square centimeter exerted in either of the two parallel planes placed, 1 cm apart when the space between them is filled with the fluid and one of the plane is moving in its own plane with a velocity of 1 cm per second relatively to the other. The unit of dynamic viscosity is the poise (abbreviated p). The centi poise (abbreviated cp) is 1/100th = of one poise.

While on the absolute scale, viscosity is measured in poise or centi poise, it is most convenient to use the kinematic scale in which the units are stokes (abbreviated S) and centi-stokes (abbreviated CS). The centistokes is 1/100th = of one stoke. The kinematic viscosity of a liquid is equal to the quotient of the dynamic viscosity and the density of the liquid at the same temperature, thus :-

$$\text{Kinematic Viscosity} = \frac{\text{Dynamic Viscosity}}{\text{Density}}$$

Viscosity of liquid may be determined by any method that will measure the resistance to shear offered by the liquid.

Absolute viscosity can be measured directly if accurate dimensions of the measuring instruments are known but it is more common practice to calibrate the instrument with a liquid of known viscosity and to determine the viscosity of the unknown fluid by comparison with that of the known.

Procedure : The liquid under test is filled in a U tube viscometer in accordance with the expected viscosity of the liquid so that the fluid level stands within 0.2 mm of the filling mark of the viscometer when the capillary is vertical and the specified temperature is attained by the test liquid. The liquid is sucked or blown to the specified weight of the viscometer and the time taken for the meniscus to pass the two specified marks is measured. The kinematic viscosity in centistokes is calculated from the following equation :

Kinematic viscosity = kt

Where k = the constant of the viscometer tube determined by observation on liquids of known kinematic viscosity, t = time in seconds for meniscus to pass through the two specified marks.

APPENDIX—XXIII

TEST FOR PYROGENS

Pyrogen Test

The pyrogen test is designed to limit to an acceptable level, the risks of febrile reaction in the patient to the administration, by injection, of the product concerned. The dose specified for the test is related to that generally given to the patient, but for practical reasons, it does not exceed 10 ml per Kg of the body weight of the test animal, injected in a brief period of time.

Apparatus : Render the syringes, needles, and glassware free from pyrogens by heating at 250° for not less than 30 minutes or by any other suitable method. Just prior to injecting it, warm the product to be tested to approximately 37°.

Test Animals : Use healthy, mature rabbits each weighing not less than 1500g, House the animals individually in an area of uniform temperature [+3° (+5°F)] and free from disturbances likely to excite them. Do not use animals for pyrogen tests more frequently than once every 48 hours, not prior to two weeks following their having been given a test sample that was adjusted pyrogenic.

Temperature Recording : Use an accurate rectum thermometer for which the time necessary to reach the maximum reading is known, or any other temperature recording device of equal sensitivity. Insert the thermometer into the rectum of the test animal to a depth of not less than that previously determined as sufficient, record the animal's body temperature.

Procedure : Not more than 40 minutes prior to the injection of the test dose, determine the "Control temperature" of each animal; this is the base for the determination of any temperature increase resulting from the injection of a test solution. In any one test, use only those animals the control of temperatures of which do not vary by more than 1° from each other, and do not use any animal with a temperature exceeding 39.8°.

Unless otherwise specified in the individual monograph, inject into an ear vein of each of three rabbits 10 ml of the product per kg of body weight, completing the injection within 10 minutes after start of administration. Record the temperature at 1, 2 and 3 hours subsequent to the injection.

Interpretation and Retest : Record the observed temperature decreases as zero. If no rabbit shows an individual rise in temperature of 0.6° or more above its respective control temperature, and if the sum of the three individual maximum temperature rises does not exceed 1.4°, the product meets the requirements for the absence of pyrogens. If any rabbit shows an individual temperature rise of 0.6° or more, of if the sum of the three individual maximum temperature rises exceeds 1.4°, repeat the test using five other rabbits. If not more than three of the eight rabbits show individual rises in temperature of 0.6° or more, and if the some of the eight individual maximum temperature rises does not exceed 3.7°, the material under examination meets the requirements for the absence of pyrogens.

APPENDIX—XXIV

CHROMATOGRAPHY

Chromatography is a separation process based upon the differential distribution of a mixture between two phases, one of which is percolated adsorbent through other mobile phase.

Here we will define the technique of chromatography. Specific requirements for chromatographic tests of drugs, including absorbent and developing solvents, are given in individual monographs.

The types of chromatography useful in qualitative and quantitative analysis that are employed in the H.P.I. assays and tests are Paper and thin-layer.

Use of Reference substances in Identity Tests : In paper and thin layer chromatography, the ratio of the distance traveled on the medium by a given compound to the distance traveled by the front of the mobile phase, from the point of the application of the test substance, is designated as the Rf value of the compound. The ratio between the distances traveled by a given compound and a reference substance is the Rf value. Rf values vary with the experimental conditions, and thus identification is best accomplished where an authentic specimen of the compound in question is used as a reference substance.

For this purpose, chromatograms are prepared by spotting on the thin layer adsorbent or on the paper in a straight in, parallel to the edge of the chromatographic plate or paper, solutions of the substance to be identified, the authentic specimen, and a mixture of nearly equal amounts of the substance to be identified and authentic specimen.

Each sample application contains approximately the same quantity by weight of material to be chromatographic. If the substance to be identified and authentic specimen are identical, all chromatograms agree in colour and Rf value and the mixed chromatogram yields a single spot, i.e., Rf is 1.0.

Location of the Spots : The spots produced by the chromatographic materials may be located by : (1) Direct inspection if the compounds are visible under white or ultraviolet light. (2) Inspection in white or UV light after treatment with reagents that will make the spots visible in paper and thin layer chromatography.

PAPER CHROMATOGRAPHY

In paper chromatography the adsorbent is a sheet of paper of suitable texture and thickness. The paper chromatography is of following types : -

Descending Chromatography : Separation of chemical compounds by descending chromatography is accomplished by a procedure of allowing the mobile phase to flow downward on the chromatographic sheet.

Apparatus : The essential equipment for descending chromatography consists of the following :

A vapour tight chamber provided with inlets for addition of solvent or for releasing internal pressure. The chamber is constructed preferably of glass or stainless steel and is so

designed as to permit observation of the progress of the chromatographic run without opening of the chamber. One or more glass troughs capable of holding a volume of solvent greater than that needed for one chromatographic run. The troughs must also be longer than the width of the chromatographic sheets.

Heavy glass antisiphoning rods to be supported by the rack and running out side of, parallel to, and slightly above the edge of the glass trough.

Chromatographic sheets of special filter paper at least 2.5cm wide and not wider than the length of the troughs are cut to a length approximately equal to the height of the chamber. A fine pencil line is drawn horizontally across the filter paper at a distance from one end such that, when the sheet is suspended from the antisiphoning rods with the upper end of the paper resting in the trough and the lower portion hanging free into the chamber, the line is located at a few cm below the rods. Care is necessary to avoid contaminating the filter paper by excessive handling or by contact with dirty surfaces.

Procedure : The substances to be analysed are dissolved in a suitable solvent. Convenient volumes, delivered from suitable micropipettes, of the resulting solution, normally containing 1 to 20 μg of the compound, are placed in 6 to 10 mm spots along the pencil line not less than 13 cm apart. If the total volume to be applied would produce spots of a diameter greater than 6 to 10 mm, it is applied in separate portions to the same spot, each portion being allowed to dry before the next is added.

The spotted chromatographic sheet is suspended in the chamber by use of the antisiphoning rod, which holds the upper end of the sheet in the solvent trough. The bottom of the chamber is covered with the prescribed solvent system. It is important to ensure that the portion of the sheet hanging below the rods is freely suspended in the chamber without touching the rack or the chamber walls or the fluid on the bottom of the chamber. The chamber is sealed to allow saturation of the chamber and the paper with the solvent vapour. Any excess pressure is released as necessary. For large chambers, saturation over night may be necessary.

After saturation of the chamber, the prepared solvent is introduced into the trough. The solvent is allowed to travel down the paper to the desired distance. Precautions must be taken against allowing the solvent to run down the sheet when opening the chamber and removing the chromatogram. The location of the solvent front is quickly marked, and the sheets are dried, the spots visualized and Rf values calculated. If the compounds being separated are colourless, their positions on the paper may be determined by spraying the paper with a suitable reagent that produces a colour.

Ascending Chromatography : In ascending chromatography the lower edge of the sheet is dipped into the mobile phase, to permit the mobile phase to rise on the chromatograph sheet.

Apparatus : The essential equipment for ascending chromatography is substantially the same as that desired under *Descending Chromatography*.

Procedure : The test materials are applied to the chromatographic sheets as directed under *Descending Chromatography*, and above the level to which the paper is dipped into the developing solvent. Empty solvent troughs are placed on the bottom of the chamber, and the

chromatographic sheets are suspended so that the end on which the spots have been added hangs free inside the empty trough.

The chamber is sealed, and saturation is allowed to proceed as directed under *Descending Chromatography*. Then the solvent is added through the inlet to the trough in excess of the solvent required for complete moistening of the chromatographic sheet. The chamber is resealed when the solvent front has reached the desired height, the chamber is opened and the sheet is removed and dried.

Further procedure may be conducted as described under *Descending chromatography*.

THIN LAYER CHROMATOGRAPHY

In thin layer chromatography, the adsorbent is a powdered material applied usually to a glass plate. Silica gel is slightly acidic and therefore is best applied to the separation of neutral and acidic substances. Alumina on the other hand is basic and should be used for the separation of basic compounds. The separations achieved may be based upon adsorption, partition or a combination of both effects, depending on its use with different solvents. Quantitative measurements are possible by removing the spots from the plate with a suitable solvent. For two dimensional thin-layer chromatography, the chromatographed plate is turned at a right angle and again chromatographed, usually in another chamber saturated with a different solvent system.

Apparatus : Flat glass plates of the following sizes are generally used—20x20 cm, 10x20 cm and 5x20 cm. An aligning tray is a flat surface upon which to align and rest the plates during the application of the adsorbent.

A storage rack to hold the prepared plates during drying and transportation. The rock holding the plates should be kept in a desiccator or be capable of being sealed in order to protect the plates from the environment after removal from the drying oven.

The adsorbent consists of the finely divided adsorbent materials, normally 5 μm in diameter, suitable for chromatography. It can be applied directly to the glass plates.

A spreader, which when moved over the glass plate, will apply a uniform layer of adsorbent of desired thickness over the entire surface of the plate.

A developing chamber that can accommodate one or more plates and can be properly closed and sealed.

An ultraviolet light source suitable for observations.

Procedure : Arrange the neat and clean plates on the aligning tray, and secure them so that they will not slip during the application of the adsorbent. Mix appropriate quantities of adsorbent and liquid, usually water, which when shaken for 30 seconds give a smooth slurry that will spread evenly with the aid of spreader. Generally an analytical plate has an adsorbent thickness of 250 μm to 500 μm, while a preparative plate has a thickness of 500 μm to 2000 μm. Allow the plates to remain undisturbed for 15 minutes, and then dry at 105° for 30 minutes. Store the prepared plates in a desiccator.

Apply the sample solution and the standard solution by means of suitable micropipettes at points about 1.5 cm apart and about 2 cm from the lower edge of the plate, and allow to dry.

Place the plate in the developing chamber. The solvent in the chamber must be deep enough to reach the lower edge of the adsorbent, but must not touch the spot points. Seal the cover in place, and maintain the system until the solvent front ascends, this commonly requires from 15 minutes to 1 hour. Remove the plates, dry them in air, and observe first under ultraviolet light. Measure and record the distance of each spot from the point of origin. If further directed, spray the spots with the reagent specified, observe, and compare the sample with the standard chromatogram.

APPENDIX—XXV

OXYGEN FLASK METHOD

Apparatus

An iodine-flask with a nominal capacity of 500 ml into the stopper of which is fused, one end of a piece of platinum wire about 13 cm long and 1 mm in diameter. Towards the other end of the wire, a piece of platinum gauze is attached to provide a means of holding the sample clear of the adsorbing liquid during combustion. The platinum gauze is about 2 cm wide and 1.5 cm long.

Method

Wrap the substance being examined in a piece of filter paper about 5 cm long and 3 cm wide, secure the package in the platinum gauze, and insert one end of a narrow strip of filter paper in the roll. Flush the flask with oxygen, moisten the neck with *water*, place the specified absorbing liquid in the flask, fill it with oxygen, tight the free end of the narrow strip of filter paper, and immediately insert the stopper. Hold the stopper firmely in place. When vigorous burning has begun, invert the flask so as to provide a liquid seal but taking care to prevent incompletely burned material falling into the liquid. Immediately combustion is complete, shake the flask vigorously for about five minutes, place a few ml of *water* in the cup top, carefully withdraw the stopper, and rinse the stopper, platinum wire platinum gauze, and sides of the flask with *water*.

Pulverisable substances should be finely ground and thoroughly mixed before the specified quantity is weighed.

For liquids place the specified quantity on about 15 mg of ashless filter paper flock contained in one part of a methyl cellulose capsule of a suitable size, close the capsule, inserting one end of a narrow strip of a filter paper between the two parts, and secure the capsule in the platinum gauze.

Ointments should be enclosed in grease proof paper before wrapping in filter paper.

For bromine : Burn the quantity of the substance specified in the monograph by the *oxygen flask method*, using as the absorbing liquid 15 ml of a mixture of 1 Volume of *strong hydrogen peroxide solution* and 9 volumes of 1N *sulphuric acid*, when the process is complete, cool in ice for fifteen minutes, add 5 ml of *dilute nitric acid* and 10 ml of 0.1N *silver nitrate* and titrate 0.05N *ammonium thiocyanate solution* as indicator and shaking vigorously as the end point is approached. Repeat the operation omitting the substance being examined. The difference between the titrations represent the number of ml of 0.05 N *silver nitrate* solution required. Each ml of 0.05 N *silver nitrate solution* is equivalent to 0.003995g of Br.

For Chlorine : Burn the quantity of the substance specified in the monograph by the *oxygen flask method*, using 20 ml of 1N *sodium hydroxide* as the absorbing liquid. When the process is complete, add 2.5 ml of *dilute nitric acid* and 2.5ml of *water*, and 10 ml of 0.1 N *silver nitrate* and titrate with 0.05N *ammonium thiocyanate*, using *ferric ammonium sulphate solution* as indicator and shaking vigorously as the end point, is approached. Repeat the operation omitting the substance being examined. The difference between the titrations

represents the ml of 0.05N *silver nitrate solution* required. Each ml of 0.05N *silver nitrate solution* is equivalent to 0.001773g of Cl.

For Fluorine : Burn the quantity of the substance specified in the monograph by the *oxygen flask method*, using 20 ml of *water* as the absorbing liquid. When the process is complete, and sufficient *water* to produce 100 ml. To 2 ml add 50 ml of *water*, 10 ml of *alizarine fluorine blue solution*, 3 ml of a solution containing. 12 percent w/v of *sodium acetate* and 6 percent w/v of *glacial acetic acid*, 10 ml of *cerous nitrate solution*, and sufficient water to produce 100 ml. Allow to stand in dark for one hour and measure the extinction of a 4 cm layer of the resulting solution at 610 µm, using as the blank a solution prepared as described above beginning at the words 'To 2 ml……..' but using 2 ml of *water* instead of the solution. Calculate the content of fluorine from a reference curve by treating suitable aliquots of a solution of *sodium fluoride* in the manner described above, beginning at the words 'add 50 ml of water'.

For iodine : Burn the quantity of the substance specified in the monograph by the *oxygen flask method*, using a mixture of 10 ml of *water* and 2 ml of 1N *sodium hydroxide* as the absorbing liquid. When the process is complete, add to the flask an excess (between 5 and 10 ml) of *acetic bromine solution* and allow to stand for 2 minutes. Remove the excess of bromine by the addition of *ferric acid* (0.5 to 1 ml), rinse the sides of the flask with *water*, and sweep out any bromine vapour above the liquid with a current of air. Add 1 g of *potassium iodide* and titrate with 0.02 N *sodium thiosulphate*, using *starch mucilage*, added towards the end of the titration, as indicator. Each ml of 0.02 N *sodium thiosulphate* is equivalent to 0.0004230g of I.

For Sulphur : Burn the quantity of the substance specified in the monograph by the oxygen flask method using 15 ml of water and 1 ml of hydrogen peroxide solution as the absorbing liquid. When the process is complete, boil the solution for 10 minutes, cool, and add 60 ml of alcohol. Titrate the solution with 0.01 M barium perchlorate, using one drop of 0.2 percent w/v solution of thoron and add 2 drops of a 0.0125 percent w/v solution of methylene blue as indicator, until the yellow colour changes to pink. Each ml of 0.01 M barium perchlorate is equivalent to 0.3203 mg of S.

APPENDIX—XXVI

PREPARATION OF NOSODES

Homoeopathic preparation from pure microbial culture obtained from diseased tissue and clinical materials (secretions, discharges etc.) are known as NOSODES or BIOTHERAPEUTIC PREPARATIONS. These are processed from original stock built from isolated microbes, diseased tissues and clinical materials from which the primary stocks are prepared. Depending upon the nature of material used, these may be divided into following 4 groups.

†N **I**. Preparations made from lysate of micro-organisms capable of producing bacterial endo-toxins e.g. *Typhoidinum, Paratyphoidinum, E. coli-bacillinum* and *Staphylococcinum* etc.

N **II**. Products made from micro-organisms capable of producing exotoxin e.g. *Diptherinum*.

N **III**. Preparations made from purified toxins.

N **IV**. Preparations made from micro organisms/viruses/clinical materials from human convalescents or diseased subjects e.g. *Variolinum, Influenzium, Psorinum, Syphillinum* and *Morbillinum*.

General method for collection and preparation of strain

Microbes available as pure organism are obtained from suitable clinical material from subjects suffering from the disease†† are isolated, cultured, and identified. Their properties are studied for complete identification as per individual monograph and they are lyophilised to ensure preservation and stability of characteristics.

The first step involved should be preparation of *culture medium* most suitable for growth of the organism from which homoeopathic nosodes are to be prepared. The solid medium generally recommended is nutrient agar which generally is satisfactory in most cases. In other instances special solid culture medium containing proteins such as blood agar, serum agar have also been recommended. Freshly isolated organisms invariably of S-type** are recommended for use. Stock nosodes should be made from recently isolated organisms only. Where this is impracticable the culture should be kept below 50° so that they retain their full antigenic value. Stock cultures are most often maintained by lyophylised state.

Repeated subcultures of a strain degenerates and lowers its antigenic value and have been found to be less useful and not recommended.

Unless otherwise specified in the individual monograph the culture is allowed to incubate for 24 hours at 37°. At the end of incubation, the micro organisms are harvested under aseptic condition by pouring sterile isotonic salt solution on the solid media and then generally shaking or scraping until all the micro-organisms have been suspended. If scraping is necessary, removal of culture medium should be avoided. Subsequently the suspension is centrifuged at 5,000 R.P.M. for 30 minutes, (3980-4070G, ICE, International centrifuge) the supernatant is discarded and bacterial pellets are resuspended in 0.9 *percent sodium chloride solution*, shaken well and centrifuged again. The suspension of bacteria is examined again for purity. It is essential that purity of the strain is maintained during incubation and handling. Purity is checked at different stages. In case of contamination the lot should be rejected and a fresh strain is used. After 24 hours of growth in incubation a colony is re-examined for

checking the characteristics and purity of the strain. The culture is then taken up in the 0.9 percent aqueous sodium chloride solution.

Strength

The growth is suspended again in isotonic solution, shaken to break up clumps and to make a uniform suspension. Number of bacteria in each ml of suspension is estimated and is adjusted 20 billion viable cells per milliliter ($2X10^{10}$). It forms the original stock in case of drugs of groups N-I and N-II. For group N-III and N-IV the strength of IX should be 1 part of the pure material in 10 parts of the suspending/diluting material which may be Lactose or Glycerin as suggested in individual monographs.

Preparation of Nosodes

Group N-I

Bacteriolysis of the suspension containing 20 billion viable cells/ml in distilled water is carried out by a sonicator till most of the bacterial cells are ruptured. The material is centrifuged at 10,000 R.P.M. for 30 minutes (3980—4070 G, ICE. International centrifuge). The supernatant is filtered through seitz filter and the cell free extract containing the endotoxin, is treated with equal volume of Strong Alcohol. This strength is sealed in separate ampoules and is labeled as primary-stock-nosode. This serves as IX for preparation of homoeopathic dilutions. This should be preserved at 4° to 6°.

Group N-II

The toxigenicity of the strain is established before use. The suspension having 20 billion viable cells/ ml is mixed with equal volume of Strong Alcohol and hermatically sealed under aseptic conditions. It is labeled as primary-stock-nosodes as IX. This should be preserved between 4° to 10°. Further attenuations are made in Dispensing Alcohol in ratio 1 : 9. This must comply with test for sterility before being issued.

Group N-III

Preparations are made by trituration in Lactose with drug strength 1/10. Attenuation upto 6X is kept in hermetically sealed ampoules and stored in conditions prescribed under individual monograph.

Group N-IV

Preparations are made by Hahnemannian method of trituration class, H.P.I., Vol. I, is followed. Attenuations upto 6X should be stored between 4° to 6°.

†The prefix N (denoting Nosodes has been given to differentiate from the conventional methods of preparation as advised for other drugs by Hahnemann.
††Comparatively virulent type.
**Smooth type.

NOTES :

1. Centrifuge speed in all the above operations should not be below 10,000 R.P.M. The operation should be for 30 minutes or till complete separation in a refrigerated centrifuge.

2. The supernatant liquid should be filtered with seitz filter or membrane filter.

3. No chemicals, antiseptic or bacteriosatics should be mixed at any stage of operation with the material. In case where normal saline solution is used, full care should be taken to completely remove the same before attenuation.

4. Preservations of all the products and potencies below 6x should be done in a Refrigerator at +4° to 6°.

5. Live organisms should be handled with care and following aseptic conditions.

6. Bacterial count means total number of organisms/ml (Live or dead).

7. As far as possible the substance used in original proving should be taken as the starting raw material.

8. To check the hygienic condition of the laboratory plate count should be done from time to time.

9. Test for sterility as mentioned for aerobic and anaerobic organism in I.P. 1964 should be made before issue of any nosode, 6x or below for therapeutic use or for manufacture of higher attenuations.

10. All potencies below 3x of Group N-I, N-II and N-III should bear date of manufacture and a life period of six months from the date of manufacture.

INDEX

A

Abroma radix
Achyranthes aspera
Actaea spicata
Adenocorticotropin
Aegle folia
Aethiops Mercurialis Mineralis
Ailanthes glandulosus
Akrot
Alstonia Scholaris
Aluminium Chloride
American arrow Poison
American ivy
American Water pepper
Ammoniacum gummi
Ammonium acetate
Ammonium aceticum
Ammonium bromidum
Ammonium bromatum
Ammonium Chromate
Ammonium Iodatum
Ammonium sulphate
Amoora rhoituka
Ampelopsis quinquifolia
Anaesthetic ether
Anagalis arvensis
Aniline
Aniline phthalate
Anthoxauthum odoratum
Antimony trichloride
Anthrakokali
Antimonium iodatum
Argentum Cynatum
Argentum iodatum
Arsenicum hydrogenatum
Aristolochia clematitis
Arsine
Arum draconitum
Arum maculatum
Arum vulgare
Asarbacca
Asarum europaeum
Ash leaved guarea

Asteria rubens
Atropine sulphate
Atropinum sulphuricum

B

Bael
Bamoney
Banafsha
Barium iodide
Baryta acetica
Baryta iodata
Bears foot
Bel
Black snake-root
Black thorn
Blumea odorata
Bone oil
Boric acid
Broad leaved laurel
Bromocresol purple
Buck wheet
Bugle weed
Butanol
Butter Cup
Butter nut
Button snake root

C

Cadmium sulphuricum
Cadmium sulphate
Caladium seguinum
Calcarea oxalica
Calcarea ova tosta
Calcium oxalate
Calcium sulphate
Calcon
Calcon trinitrate
Candytuft
Cat thyme
Cedron
Celts foot
Cephlandra indica
Chandani
Chelone glabra
Chelone oblique
Cherry laurel
Chick pea

Chinese sumac
Chloroform
Chromatography
Cistus Canadensis
Citric acid
Clematis erecta
Coccinia indica
Contents
Cortinotrophin
Corynobactereum dipthereae
Cow’s milk
Coryza obovata
Cucurbita pepo
Cupric sulphate
Curare
Cyclamen aestivum
Cyclamen cordifolia
Cyclamen europaeum
Cyclamen elusi
Cyclamen orbiculata
Cyclamen purpurasens

D

Daphne foetida
Daphne indica
Devardas Alloy
Dimethyl yellow
Diptherianum
Disodium edetate
Disodium hydrogen arsenate
Dita bask
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HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H.P.I.)

VOLUME – V

FIRST EDITION

1986



GOVERNMENT OF INDIA
MINISTRY OF HEALTH

F O R E W O R D

The Homoeopathic Pharmacopoeia Committee was reconstituted by Government of India, Ministry of Health and Family Welfare vide letter No. X. 19018/26/79-Homoeo., dated the 12th November, 1981. After completion of Fourth Volume of Homoeopathic Pharmacopoeia of India, the Committee has finalised 114 monographs for the Fifth Volume.

As in the earlier volumes the material in this volume consists of the following items besides 114 monographs :

(i) Preface
(ii) Introduction
(iii) General Notices
(iv) General Instructions
(v) Appendices

The Fifth Volume of Homoeopathic Pharmacopoeia of India is presented herewith to Government of India.

Sd/-
DR. B. P. MISRA
Secretary
Homoeopathic Pharmacopoeia Committee

NEW DELHI
Dated : 30th July, 1985

DR. DIWAN HARISH CHAND
Chairman
Homoeopathic Pharmacopoeia Committee

PREFACE

The Government of India constituted a Homoeopathic Pharmacopoeia Committee in 1962 for the purpose of preparing the Homoeopathic Pharmacopoeia of India with the following objects :

(1) to prepare a Pharmacopoeia of Homoeopathic drugs whose therapeutics usefulness has been proved, on the lines of American, German and British Homoeopathic Pharmacopoeia;

(2) to lay down principles and standards for the preparation of homoeopathic drugs;

(3) to lay down test of identity, quality, purity; and

(4) such other matters as are incidental and necessary for the preparation of Homoeopathic Pharmacopoeia.

The Committee approved 180 monographs which comprised Volume I of Homoeopathic Pharmacopoeia of India (1971).

The Homoeopathic Pharmacopoeia Committee was reconstituted by Government of India, Ministry of Health and Family Welfare in 1971 which approved 265 monographs which comprised Volume II (1974) (100 monographs), Volume III (1978) (105 monographs) and part of Volume IV (1984) (60 monographs) of Homoeopathic Pharmacopoeia of India.

The Homoeopathic Pharmacopoeia Committee was again reconstituted by Government of India, Ministry of Health and Family Welfare vide letter No. X. 19018.26/79-Homoeo dated 12th November, 1981. The members of the Committee are as follows :-

1. Honorary Adviser (Homoeo.) Dr. Diwan Harish Chand, M.B.B.S., LRCP (Edin) DTM & H (L'Pool.) M.D. Hom., F.F. Hom. (Lond.), D.H.T. (U.S.A.) — *Chairman*
2. Drugs Controller (India) (Dr. S. S. Gothoskar) — *Member*
3. Director, Central Drugs Laboratory, Calcutta (Dr. S. K. Roy) — *Member*
4. Director, Homoeopathic Pharmacopoeia Laboratory, Ghaziabad (Mr. P. N. Varma) — *Member*
5. Deputy Adviser (Homoeo.) Govt. of India (Dr. V. T. Augustine) — *Member*
6. Director, Central Council for Research in Homoeopathy, New Delhi (Dr. D. P. Rastogi) — *Member*
7. Dr. P. N. Mehra, D.Sc., F.N.I., F.N.A.Sc., Chandigarh — *Member*
8. Prof. & Head of Deptt. of Chemistry, University of Delhi, Delhi (Prof. M. Krishnamurti) — *Member*
9. Prof. & Head of Deptt. of Microbiology, A.I.I.M.S., New Delhi (Dr. L. N. Mahapatra) — *Member*
10. Shri G. S. Bhar, B.A., Homoeopathic Manufacturing Pharmacist, Calcutta. — *Member*

11. Dr. R. K. Bhandari, Homoeopathic Manufacturing Pharmacist, Delhi *Member*
12. Dr. Joseph Zakarias, Homoeopathic Manufacturing Pharmacist, Manglore *Member*
13. Dr. A. U. Ramakrishna, M.B.B.S., M.F. Hom. (Lond.) Homoeopathic Physician, Madras *Member*
14. Dr. Dilip Kumar Saha, M.B.B.S., D.F. Hom. (Lond.) Homoeopathic Physician, Calcutta *Member*
15. Dr. K. P. Muzumdar, B.Sc., D.M.S. Homoeopathic Physician, Bombay *Member*
16. Asstt. Adviser (Homoeo.) Govt. of India (Dr. B. P. Misra from April 1985. *Member*

The Committee appointed a Working Group consisting of the following members to scrutinise the initial rafts of monographs prepared by the staff :-

1. Dr. P. N. Mehra *Chairman*
2. Shri P. N. Varma *Member*
3. Shri G. S. Bhar *Member*
4. Dr. M. Krishnamurti *Member*
5. Dr. D. P. Rastogi *Member*
6. Asstt. Adviser, (Homoeo.) Ministry of Health & Family Welfare *Secretary*

The Homoeopathic Pharmacopoeia Committee was assisted by the following technical staff:-

1. Dr. B. S. Ahuja *Botanist*
2. Dr. S. P. Singh *Research Officer (Homoeo)*
3. Dr. G. P. Garg *Chemist*
4. Dr. (Mrs.) S. L. Sehgal *Research Asstt. (Homoeo)*

This Committee finalised 47 monographs which comprised part of Fourth Volume, 1984 of Homoeopathic Pharmacopoeia of India.

This Committee also approved 100 revised monographs which comprises the second edition of Second Volume of Homoeopathic Pharmacopoeia of India.

The Committee has now finalised and approved 114 monographs which comprises Fifth Volume of Homoeopathic Pharmacopoeia of India.

The Committee specially commends the work of Homoeopathic Pharmacopoeia Laboratory, Ghaziabad, for assistance in preparation in general and for providing technical data in particular for the monographs. The Government of India, Ministry of Health and Family Welfare takes this opportunity to record its appreciation of work done by the Committee and the staff engaged in this work.

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I N T R O D U C T I O N

Four volumes of Homoeopathic Pharmacopoeia of India have already been published as follows :

Volume	No. of monographs	Year of publication
Volume I of H.P.I.	180	1971
Volume II of H.P.I.	100	1974
Volume III of H.P.I.	105	1978
Volume IV of H.P.I.	107	1984

The present Volume V comprises of 114 monographs. Although the general notices and general instructions are mainly contained in Volume I of H.P.I. (1971), some amendments have been made subsequently in Volume II (1974) and Volume III of H.P.I. (1978), which should be deemed to be applicable to the contents of all the volumes published so far unless otherwise revision of the text takes place in each in the revised edition.

GENERAL NOTICES / GENERAL INSTRUCTIONS

The General notices/general instructions and the appendices of the first volume as amended in second, third and fourth volumes are applicable to the material of this fifth volume of Homoeopathic Pharmacopoeia of India as well as to the earlier volumes. The monographs on Chamomilla of Volume I stands superseded by a revised monograph appearing in this Volume.

List of Monographs for H.P.I. Volume – V with Abbreviations

S. No.	Name of the Monograph	Abbreviation
1.	Abies Nigra	Abies n.
2.	Aesculus Glabra	Aescul. g.
3.	Agaricus Emeticus	Agaric. e.
4.	Alstonia Constricta	Alst. con.
5.	Alumina Phosphorica	Alu. ph.
6.	Aluminium Silicate (not published in Pharmacopoeia)	Alu. sil.
7.	Ammonium Nitricum	Am. nit.
8.	Ammonium Phosphoricum	Am. phos.
9.	Ammonium Picricum	Am. pic.
10.	Anacardium Occidentale	Anac. oc.
11.	Antimonium Oxydatum	Antim. ox.
12.	Asparagus Officinalis	Asp. off.
13.	Aurum Sulphuratum	Aur. sul.
14.	Barium Sulphuricum	Bar. sul.
15.	Barosma Crenata	Bar. cren.
16.	Benzinum Nitricum	Benz. nit.
17.	Beryllium Metallicum	Be. metal.
18.	Bothrops Lanceolatus (not published in Pharmacopoeia)	Bot. lan.
19.	Brachyglottis Repens	Brac. rep.
20.	Branca Ursina	Branca
21.	Calcarea Muriatica	Calc. mur.
22.	Caltha Palustris	Cal. pal.
23.	Chamomilla	Cham.
24.	Chloroformum	Chlorf.
25.	Chlorum	Chlorum
26.	Chrysarobinum	Chrys.
27.	Cineraria Maritima	Cin. mar.
28.	Cocanium Muriaticum	Coca. mur.
29.	Comocladia Dentata	Com. dent.
30.	Curcuma Longa	Curcuma
31.	Cypripedium Pubescens	Cypr. pub.
32.	Duboisia Myoporides	Dub. myop.
33.	Epiphagus Virginiana	Epi. vir.
34.	Euphorbia Corollata	Euphor. c.
35.	Eupionum	Eupion.
36.	Ferrum Magneticum	Fer. mag.
37.	Gaultheria Procumbens	Gal. proc.
38.	Gentiana Cruciata	Gent. c.
39.	Gratiola Officinalis	Grat. off.
40.	Hedera Helix	Hed. hel.

S. No.	Name of the Monograph	Abbreviation
41.	Helianthus Annus	Hel. ann.
42.	Hyoscyaminum	Hyosm.
43.	Iodoformum	Iodof.
44.	Juncus Effusus	Juncus
45.	Kali Chromicum	Kali. chr.
46.	Lilium Tigrinum (not published in Pharmacopoeia)	Lil. tig.
47.	Lithium Benzoicum	Lith. ben.
48.	Lobelia Cardinalis	Lob. card.
49.	Lolium Temulentum	Lol. tem.
50.	Lycopersicum Esculentum	Lyco. es.
51.	Mancinella	Mancin.
52.	Manganum Muriaticum	Mng. Mur.
53.	Manganum Oxydatum Nigrum	Mang. oxy.
54.	Menispermum Canadense (not published in Pharmacopoeia)	Meng.
55.	Mercurius Et Kali Iodatus	Merc. ki.
56.	Mercurius Nitricus	Merc. nit.
57.	Narcotinum	Narcot.
58.	Natrum Bromatum	Nat. brom.
59.	Natrum Chloratum	Nat. chl.
60.	Natrum Iodatum	Nat. iod.
61.	Natrum Silicatum	Nat. sil.
62.	Natrum Sulphurosum	Nat. sulph.
63.	Niccolum Carbonicum	Nic. carb.
64.	Niccolum Metallicum	Nic. met.
65.	Nymphaea Odorata	Nym. odo.
66.	Oenanthe Crocata	Oen. croc.
67.	Palladium	Pallad.
68.	Pastinaca	Pastin.
69.	Paullinia Pinnata	Paul. p.
70.	Phellandrium Aquaticum	Phel. aq.
71.	Picrotoxinum	Picro.
72.	Pilocarpinum Muriaticum	Pil. mur.
73.	Pinus Sylvestris	Pin. syl.
74.	Platinum Muriaticum	Plat. mur.
75.	Plumbum Aceticum	Pl. acet.
76.	Plumbum Chromicum	Pb. ch.
77.	Populus Tremuloides	Pop. trem.
78.	Prunus Padus	Prun. pad.
79.	Pyrus	Pyrus
80.	Radium Bromide	Rad. br.
81.	Ranunculus Acris	Ran. acri.
82.	Raphanus Sativus	Raph. sat.

S. No.	Name of the Monograph	Abbreviation
83.	Rhamnus Catharticus	Rha. cath.
84.	Robina Pseudocacia	Robinia
85.	Santoninum	Santon.
86.	Solanum Carolinense	Sol. caro.
87.	Solidago Virgaurea	Sol. vir.
88.	Sterculia Accuminata	Ster. ac.
89.	Strontium Carobonicum	Str. carb.
90.	Strychninum Nitricum	Stry. nit.
91.	Strychninum Phosphoricum	Stry. phos.
92.	Strychninum Sulphuricum	Stry. sul.
93.	Sulphanilamide	Sulamid.
94.	Symphoricarpus Racemosus	Sym. rac.
95.	Tamus Communis	Tamus c.
96.	Tanacetum Vulgare	Tan. vulg.
97.	Thallium	Thal.
98.	Thea Chinensis	Thea
99.	Thiosinaminum	Thiosin.
100.	Thlapsi Bursa Pastoris	Thal. b. p.
101.	Thymolum	Thymol
102.	Tilia Europaea	Til. euro.
103.	Titanium	Titan.
104.	Trifolium Paratense	Tri. prat.
105.	Tussilago Petasites	Tuss. pet.
106.	Uranium Nitricum	Uran. nit.
107.	Usnea Barbata	Usnea b.
108.	Yucca Filamentosa	Yuc. fila.
109.	Zincum Aceticum	Zinc . ac.
110.	Zincum Bromatum	Zine. br.
111.	Zincum Muriaticum	Zinc. mur.
112.	Zincum Oxydatum	Zinc. ox.
113.	Zincum Phosphoratum	Zinc. phos.
114.	Zincum Valerianicum	Zinc. val.

Revised Monograph Appeared in HPI Vol. VII

ABIES NIGRA

(Abies. n.)

Amber resin

Description : Resin is obtained by distilling the volatile oil from the oleo-resin, obtained from *Abies nigra* Linn., *Pinus nigra* Linn. Translucent, pale yellow, angular, brittle, glassy masses; odour and taste, terebinthinate. Soluble in *alcohol*, *benzene*, *solvent ether* and *carbon di-sulphide*; partly soluble in *petroleum ether*; insoluble in *water*.

Identification : 1. Dissolve 0.1 g in 1.0 ml *acetic anhydride* by slow heat, cool and add one drop of *sulphuric acid*; bright purple colour rapidly changing to violet is produced.

2. Shake about 0.1 g with 10 ml of *petroleum ether* and filter, add to the filtrate 20 ml of *copper acetate solution*; bright bluish-green colour is produced.

Acid value : 150º to 180º, (H.P.I., Vol. I,).

Sulphated ash : Not more than 0.2 percent, (H.P.I., Vol. I,).

History and authority : Proved and introduced by Leaman, *Olhio Medical and Surgical Report* 13; Allen: *Encyclop. Mat. Med.*, Vol. I, 2; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 2.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Abies Nigra	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VII

AESCULUS GLABRA
(Aescul. g.)

Botanical name : *Aesculus glabra* Willd. **Family**: Hippocastanaceae

Synonyms : *Aesculus chinensis* Michz, *Pavia glabra* Spach, *P. pallida* Spach.

Common name : *English*: Foetid, Chio Buckeyes, Smooth leaved horse chestnuts.

Description : Small tree, upto 10 m in height with smooth bark, exhaling an unpleasant odour. Leaflets 5, oval or cuneate-obovate, finely serrate, smooth; panicle 12.5 to 15 cm long. Flowers, greenish-yellow; petals of nearly equal length, their claws as long as the calyx; stamens exserted. Fruit a capsule, echinate, 3 to 4 cm in diameter. Seeds large, about 2.5 cm in diameter, glossy brown when newly exposed, bearing conspicuous scar.

Part used : Ripe nut excluding outer shell.

Identification : (i) To 2 ml of the *chloroform* extract, add 2 drops of *Dragendorff*'s *reagent;* a yellow precipitate is formed.

(ii) To 2 ml of 60 percent alcoholic extract, add two drops of *lead acetate solution;* a yellow precipitate is produced.

(iii) To 2 ml of 60 percent alcoholic extract, add one drop of *alcoholic ferric chloride solution*; a deep green colour is produced.

Distribution : From Western Pennsylvania to Nebraska, South to Texas and Alabama.

History and authority : Proved and introduced by Hale; Allen: *Encyclop. Mat. Med*., Vol. I, 48; Hering: *Guiding Symptoms*, Vol. I, 73.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Aesculus Glabra in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

AGARICUS EMETICUS
(Agaric. e.)

Botanical name : *Russula emetica* Fr. **Family**: Russulaceae

Common name : *English*: Acrid agaric.

Description : A small mushroom, having cap 4 to 8 cm wide, pressed in the center, surface bright red when fresh, fading to pale-red when old; cuticle easily peeled off, surface slightly sticky when young, margin prominently striate. Flash pale-red under the cuticle otherwise white. Gills 8 to 12 per cm at the margin, 4 to 8 mm wide, narrowly adnate or free, white, spaces between them veined where gills join the cap, a few forked near the stalk 4 to 7 cm long, 1 to 2 cm thick, cylindrical or tapering upward, white or tinged red spongy, solid, solitary or scattered on the soil or on very rotten wood in swampy place. Taste acrid when raw but disappears when coocked.

Part used : Whole mushroom.

Microscopical : Gills grow downward and are covered with hymenium of basidia interspersed amongst which are phaerocyst, the scattered latex cells and spiny flanged amyloid spores 8 µ in diameter.

Distribution : Khasia hills and Darjeeling.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, 68.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Agaricus Emeticus, moist magma containing solids 100 g and plant moisture 567 ml	667 g
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

Revised Monograph Appeared in HPI Vol. VII

ALSTONIA CONSTRICTA
(Alst. con.)

Botanical name : *Alstonia constricta* F. Muell. **Family**: Apocynaceae

Common name : *English*: Fiver bark.

Description : A tall shrub or small tree, up to 12 m in height. Leaves opposite, on long petioles mostly oblong-lanceolate but varying from almost ovate to narrow-lanceolate, acute or acuminate, the primary veins distinct, oblique and not very prominent. Flowers numerous in corymbose cymes, either solitary and terminal or 2 together in the forks of the branches and shorter than the leaves. Calyx segments ovate, almost acute with a few minute and irregular glands at the base inside. Corolla tube lobes glabrous or slightly bearded inside at the base, the right hand edges over-lapping in the bud. Seeds linear, flat or concave, pubescent, 8 to 12 mm long, ciliate with long hairs, at the upper end and shorter ones at the lower.

Part used : Bark.

Macroscopical : The bark occurs in quills and curved pieces often of considerable size. The outer surface brown or yellowish-brown, strongly rugose with large, deeply fissured reticulations; internally cinnemon-brown and coarsely striated. The fracture short and granular in the outer layer and fibrous in the inner.

Microscopical : Transverse section exhibits an abundant dark brown periderm of thin yellowish-brown layer; the secondary phloem, containing abundant fibres in tangentially arranged groups.

Distribution : Australia.

History and authority : Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 65.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Alstonia Constricta in *coarse powder*	100 g
Purified water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. VII

ALUMINA PHOSPHORICA
(Alu. ph.)

Chemical formula : $AlPO_4$ **Mol. Wt.**: 121.95

Common name : Aluminium phosphate; *German*: Aluminium phosphate.

Description : A white powder generally available in form of gel; odourless; tasteless. Soluble in dilute mineral acids; insoluble in *water* and in *alcohol*. Contains not less than 80.0 percent of $AlPO_4$.

Identification : (i) A solution in *dilute hydrochloric acid* yields the reactions characteristic of *aluminium*.

(ii) A solution in *dilute nitric acid* yields the reactions characteristic of *phosphate*, H.P.I, Vol. I,

Reaction : pH of a 4.0 percent w/v suspension in *carbon dioxide free water* should be 5.5 to 6.5.

Arsenic : Not more than 5 parts per million, H.P.I, Vol. I,

Lead : Not more than 60 parts per million, H.P.I, Vol. I,

Chloride : Dissolve 0.2 g in 10 ml of *dilute nitric acid*, boil, cool, dilute to 200 ml with water and filter; 25 ml of the filtrate complies with the *limit test of chloride*, H.P.I, Vol. I,

Sulphate : Dissolve 1 g in 10 ml of *dilute hydrochloric acid*, boil, cool, dilute to 160 ml with *water* and filter; 10 ml of the filtrate, on addition of 2 ml of *dilute hydrochloric acid* complies with the *limit test of sulphates*, H.P.I, Vol. I,

Assay : Dissolve 0.8 g in 100 ml of *dilute hydrochloric acid*. To 10 ml add 25 ml of 0.05 M *disodium acetate*, then add strong *ammonia solution* drop wise until the solution is just alkaline to *litmus* paper. Boil gently for five minutes, cool and add 10 ml of a solution prepared by dissolving 7.7 g of *ammonium acetate* in 50 ml of *water* adding 6 ml of *glacial acetic acid* and sufficient *water* to produce 100 ml. Adjust the pH to 4.5 with *glacial acetic acid* and 2 ml of a 0.025 percent w/v *solution of dithizone* in *alcohol*. Add sufficient *alcohol* to double the volume of the solution and titrate with 0.05 M *zinc chloride* until the colour changes to red. Each ml of 0.05 M *disodium acetate* is equivalent to 0.006098 g of $AlPO_4$.

History and authority : Introduced by Kent: *New Remedies*, (Indian edition 1963), 2.

Preparation : (a) Trituration 1x — Drug strength 1/10

Alumina Phosphorica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x should be kept in well-closed container in a cool place.

Revised Monograph Appeared in HPI Vol. VII

AMMONIUM NITRICUM
(Am. nit.)

Chemical formula : NH_4NO_3 **Mol. Wt.**: 80.04

Common name : Ammonium nitrate.

Description : Colourless crystals or crystalline powder; odourless, hygroscopic. Soluble in *alcohol*. Freely soluble in *water*. Contains not less than 99.5 percent of NH_4NO_3 calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields the *reactions* characteristic of *ammonium salts*, H.P.I., Vol. I, and of nitrates, H.P.I., Vol. I,

Reaction : pH of 0.05 percent w/v solution is not less than 4.6.

Sulphated ash : Not more than 0.05 percent.

Arsenic : Not more than 1 part per million.

Heavy metals : Not more than 5 parts per million.

Iron : 10 g complies with the *limit test for iron*, H.P.I., Vol. I,

Sulphate : 10 g complies with the *limit tests for sulphates*, H.P.I., Vol. I,

Chloride : Dissolve 5 g in 50 ml of *water* and add 1 ml of *dilute nitric acid*. Add 1 ml of strong *silver nitrate solution*; no turbidity is appeared.

Assay : Dissolve 2.8 g in 50 ml of *water* in a 500 ml flask, add 50 ml of 1 N *sodium hydroxide*. Place a funnel on the flask and boil for 10 to 15 minutes to expel all the ammonia. Cool and titrate the excess alkali with 1 N *sulphuric acid* using *thymol blue* as indicator. Each ml of 1 N *sodium hydroxide* is equivalent to 0.8004 g of NH_4NO_3.

History and authority : Introduced by Wibmer; Allen: *Encyclop. Mat. Med*., Vol. I, 305.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

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AMMONIUM PHOSPHORICUM
(Am. phos.)

Chemical formula : $(NH_4)_2HPO_4$ **Mol Wt.**: 132.07

Common name : *English*: Ammonium phosphate.

Description : Small colourless crystals or white granules; taste saline and cooling. Loses ammonia on exposure to air. Freely soluble in *water*; insoluble in *alcohol* and *acetone*. Contains not less than 97.0 percent and not more than 102.0 percent of $N_2H_9PO_4$ with reference to the substance dried to constant weight.

Identification : Yields reactions characteristic of *ammonium salt and of phosphates*, H.P.I., Vol. I, and

Reactions : The pH of 0.2 M solution is between 7.5 and 8.1.

Heavy metals : Not more than 10 parts per million.

Arsenic : Not more than 1 part per million.

Iron : 4 g complies with the *limit test for iron*.

Assay : Weight accurately about 0.1 g. Transfer in distillation flask. Dissolve in 100 ml of *water* and *add 50 ml of sodium hydroxide solution*. Distil off ammonia in 25 ml of 0.1 N *hydrochloric acid* mixed with 50 ml of *water* and titrate with 0.1 N *sodium hydroxide solution*. Run a blank omitting the sample. The difference represents the consumption of 0.1 N *hydrochloric acid* against ammonia evolved from *ammonium phosphate*. Each ml of 0.1 N *hydrochloric acid* consumed is equivalent to 0.006603 g of $(NH_4)_2HPO_4$.

History and authority : Introduced by Voigt, *Bost. Med. and Surg. Journ.* Vol. XXXIV, 308; Allen: *Encyclop. Mat. Med.*, Vol. I, 289; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 95.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium phosphoricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to the liquid 8x, H.P.I., Vol. I,

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AMMONIUM PICRICUM
(Am. pic.)

Chemical formula : $C_6H_6N_4O_7$ **Mol. Wt.**: 246.14

Common name : *English:* Ammonium picrate; *French:* Picrate d' ammoniaque.

Description : Bright yellow, scales or orthorhombic crystals or prisms; taste bitter. Explodes easily from heat or shock. Soluble in *water*, slightly soluble in *alcohol*. Contains not less than 95.0 percent of $C_6H_6N_4O_7$ with reference to the substance dried to constant weight on anhydrous *calcium chloride*.

Identification : 1. On warming with s*odium hydroxide*, ammonia is evolved which is recognized by its odour, by its reaction on moist *red litmus paper* and by its ability to produce a black stain on filter paper impregnated with mercurous nitrate solution.

2. Yields reactions characteristic of *ammonium salts* and of *picrates*.

Assay : Dissolve about 0.2 g accurately weighed in hot *water* and titrate with 0.1 N *sodium hydroxide solution*, using *phenolphthalein* as indicator. Each ml of 0.1 N *sodium hydroxide* is equivalent to 0.0246 g to $C_6H_6N_4O_7$.

History and authority : Introduced by Hale; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 96

Preparation : (a) Trituration 1x — Drug strength 1/10

Ammonium Picricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Very explosive, trituration upto 2x should be prepared in small quantities with great care.

Storage : Preparations below 3x to be kept in well-closed container in a cool place.

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ANACARDIUM OCCIDENTALE

(Anac. oc.)

Botanical name : *Anacardium occidentale* Linn. **Family:** Anacardiaceae

Description : An erect, spreading, evergreen tree, up to 15 m in height with rough bark. Leaves 10.2 to 20.5 by 7.5 to 13 cm, hard, obovate or obovate-oblong, obtuse, retuse or rounded. Flowers 8 mm in diameter, petals yellow with pink stripes; stamens usually 9, all fertile, one larger than the rest. Fruit reniform nut, 2.5 cm long, greenish-grey; the oleaginous shell or pericarp is hard, smooth and shining, thick and cellular and contains an acrid oily juice, which is powerfully vesicant; it encloses a slightly curved white kernal covered by a thin reddish-brown skin or testa. Nut seated on a pyriform fleshy receptacle, commonly called apple which enlarges up to 5 to 8 cm long as it matures. Juice is extracted in solvent *ether*. Thereafter the solvent *ether* is evaporated at room temperature, the oil obtained is of brown colour and of semi-solid consistence.

Part used : Black oily juice of the shell.

Distribution : Indigenous to Mexico and Brazil. Naturalised and cultivated in coastal districts of India, especially in the West coast.

History and authority : Introduced by Hering: *Guiding Symptom*, Vol. I, 283; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 101.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Anacardium Occidentale (dried juice) in *coarse powder*	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) 2x and higher with *Dispensing Alcohol*.

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ANTIMONIUM OXIDATUM

(Antim. ox.)

Chemical formula : Sb_2O_3 **Mol. Wt.**: 291.50

Common name : *English:* Antimony trioxide.

Description : Greyish-white powder, fuses at low heat. Insoluble in *water*, soluble in *hydrochloric acid*. Contains not less than 99.0 percent of Sb_2O_3 with reference to the substance dried to constant weight at 105°.

Identification : Dissolve 1.0 g in 3 ml of *dilute sulphuric acid.* Add 1 ml of 10 percent *potassium iodide solution* and 5 ml of *benzene*. Shake and add 1 ml of 0.2 percent *rhodamine B solution*; the benzene layer turns violet.

Chloride : Dissolve 1.0 g in 2 ml of *nitric acid* and proceed as per the *limit test for chloride,* H.P.I., Vol. I,

Sulphate : Dissolve 10 g in 10 ml of *nitric acid* and proceed as per the *limit test for sulphates,* H.P.I., Vol. I,

Heavy metals : Dissolve 2.5 g in 2 ml of *dilute nitric acid*. Adjust the pH with *dilute ammonia solution* between 6 and 7 and proceed as directed under the *limit test for heavy metals,* H.P.I., Vol. I,

Arsenic : Dissolve 0.5 g in 10 ml of *hydrochloric acid* and allow to stand for one hour, *limit for arsenic* is not more than 20 parts per million, H.P.I., Vol. I,

Iron : Dissolve 1.0 g in 2 ml *hydrochloric acid* and dilute to 40 ml with *water* and proceed as directed under *limit test for iron,* H.P.I., Vol. I,

Assay : Dissolve about 0.25 g accurately weighed in *dilute hydrochloric acid*, add 5 g of *potassium sodium tartrate*, dissolved in 30 ml of *water* and 2 g of *sodium bicarbonate*. Titrate with 0.1 N *iodine* is equivalent to 0.007288 g of Sb_2O_3.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. I, 376.

Preparation : (a) Trituration 1x — Drug strength 1/10

Antimonium Oxidatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I,; 6x may be converted to liquid 8x, H.P.I., Vol. I,

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ASPARAGUS OFFICINALIS
(Asp. off.)

Botanical name : *Asparagus officinalis* Linn. **Family**: Liliaceae

Common names : *English:* Asparagus; *French:* Asperge; *German:* Spargel.

Description : A perennial, deciduous herb, up to 2 m in height. Stem erect, unarmed, terete branching, ultimate branches filiform, 8 to 15 mm long, cladodes 3 to 3 in a fascicle, 0.6 to 2.54 cm long, terete; leaves scales with a short soft spur at base; pedicels solitary or paired lateral, 5 to 10 mm long, jointed in the middle. Flowers greenish-white, 1 to 4 in axils with cladodes or branches, companulate, 3 to 5 mm long. Fruit red, spherical about 8 mm thick.

Part used : Young shoots.

Identification : Evaporate 60 percent alcoholic extract on *water-bath* to remove *alcohol*. Extract with *chloroform*, separate the two layers and carry out TLC as follows:

(i) Carry out TLC of *chloroform* extract on silica gel 'G' using *chloroform* as mobile phase. It gives four spots at R_f 0.05, 0.12, 0.30 and 0.35 giving blue fluorescence in UV light. On spraying with *antimony trichloride* and heating, an additional spot appears at R_f 0.20.

(ii) Carry out TLC of the aqueous extract on *silica gel* 'G' using *butanol* : *acetic acid* : *water* (4 : 1 : 1) as mobile phase. On spraying with *ninhydrin reagent* and heating at 110°, two violet spots appear at R_f 0.21 and 0.54.

(iii) Spot the aqueous extract on Whatman paper, using *butanol : acetic acid : water* (4 : 1 : 1) as mobile phase. On spraying with *ninhydrin reagent* and heating at 110°, two spots appear at R_f 0.14 and 0.25 (violet).

Distribution : Europe.

History and authority : Introduced and proved by Buchner in 1840, *Hygea* XII, 426; Allen: *Encyclop. Mat. Med*., Vol. I, 527; Hering: *Guiding Symptom*, Vol. II, 231.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Asparagus Officinalis in *coarse powder*	100 g
Purified Water	400 ml

Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

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AURUM SULPHURATUM
(Aur. sul.)

Chemical formula : Au_2S_3 **Mol. Wt.**: 490.20

Common name : *English:* Gold trisulphide.

Description : Blackish brown powder; odourless; tasteless; soluble in *ammonium* and *potassium sulphides*; insoluble in *alcohol* and *water*. Freshly prepared and unheated gold trisulphide is yellow. It is sensitive to light and decomposes at 200º. Contains not less than 79.0 percent of Au, with reference to the substance dried to constant weight at 105°.

Identification : Dissolve 10 mg in 5 ml of *sodium sulphide solution*, divided into two parts.

(i) To one drop of the solution in a micro-test-tube add one drop of 1 percent *mercuric chloride solution* and one drop of 10 percent *stannus chloride solution* after 5 minutes, the suspension is centrifuged and clear solution is poured off, it is washed several times with *dilute hydrochloric acid*. After decanting and pipetting the last wash-liquid, the test tube is gently heated initially and then strongly to dispel off mercury. After cooling, run down two drops of *bromine-hydrochloric acid* (equal volumes of *bromine*, *water* and *hydrochloric acid*) from the side of the tube by means of the fine pipette. Add one drop of *hydrochloric acid* and one drop of aqueous *rhodamine solution*. The mixture is shaken with 6 to 8 drops of *benzene.* The *benzene* layer turns red violet to pink.

(ii) To another drop of the solution on a filter paper add one drop of *benzidine solution* in *acetic acid*; blue colour is produced.

Insoluble matter : Weigh about 0.5 g and suspend in 10 ml of *water*, warm and filter. Evaporate the filtrate on a water bath. The residue weighs not more than 0.5 mg.

Ether soluble impurities : Weigh about 1.0 g and shake with three successive quantities of 2 ml of *ether*. Decant each time in tared vessel. Evaporate; the residue weighs not more than 0.1 mg.

Assay : Weigh accurately about 0.2 g into a conical flask, containing 50 ml of *water* and 5 ml of concentrate *hydrochloric acid* and heat the solution to boiling; add 25 ml of 5 percent aqueous *hydroquinone solution*; (3 ml for every 25 mg of Au) and boil for 30 minutes. Allow to cool and filter through whatman No. 42 filter paper; wash thoroughly with hot *water*. The small particles of gold remaining in the bottom of the beaker (easily see with a small flash lamp) are

best removed with pieces of ashless filter paper; burn the filter paper in silica crucible and ignite upto a constant weight and weigh, each g is equivalent to 1.241 g of Au_2S_3.

History and authority : Introduced by Malin; Allen: *Encyclop. Mat. Med*., Vol. II, 23.

Preparation : (a) Trituration 1x — Drug strength 1/10

Aurum Sulfuratum in *Coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Keep in a well-closed container, protected from light.

BARIUM SULPHURICUM

(Bar.sul.)

Chemical formula : $BaSO_4$ **Mol. wt.**: 233.43

Common names : *English*: Barium sulphate; *French*: Burilsulphas; *German*: Glaubersalz

Description : Fine, white, heavy powder, free from grittiness. Odourless; tasteless; soluble in hot *sulphuric acid*; practically insoluble in *water*; contains not less than 97.5 percent and not more than 100.5 percent of $BaSO_4$.

Identification : (i) Mix 500 mg with 2 g each of *anhydrous sodium carbonate* and *anhydrous potassium carbonate,* heat the mixture in a crucible until fusion is complete, treat the resulting fused mass with hot *water* and filter; the filtrate, acidified with *hydrochloric acid,* responds to the *tests for sulphates*.

(ii) Dissolve a portion of the well-washed residue from test (i) in *acetic acid*; the solution responds to the *tests for barium*.

Acidity or alkalinity : Digest 1 g with 20 ml of *water* for 5 minutes; the *water* remains neutral to *litmus*.

Loss on ignition : Weigh accurately 2 g and ignite, the loss corresponds to not more than 2.0 percent of its weight.

Organic matters : Recently ignited test tube; no white fumes appear and no appreciable darkening is produced.

Phosphate : Boil 1 g with a mixture of 3 ml *nitric acid* and 5 ml *water* for 5 minutes and add *water* to restore the original volume. Filter and warm, add to the warm filtrate an equal volume of *ammonium molybdate*; no yellow precipitate is formed.

Sulphide : Boil 1 g with a mixture of 10 ml *dilute hydrochloric acid* and 90 ml *water* for 10 minutes in a 250 ml conical flask and expose *lead acetate paper* to the escaping vapours; the paper does not darken.

Arsenic : 2 g complies with the *limit test for arsenic*.

Assay : Weigh accurately not less than 0.58 g and not more than 0.62 g in a tared platinum crucible, add 10 g of *fusion mixture*. Fuse until a clear melt is obtained and heat for additional 30 minutes. Cool, transfer fused mass to a beaker; add 250 ml of *water* and heat to dissolve the melt. Cool the beaker in an icebath until the precipitate settles, decant the clear liquid, filter and wash the residue with about 10 ml of *dilute hydrochloric acid* and wash paper well with water. Add 100 ml water to the residue, 50 ml of *hydrochloric acid,*

10 ml *ammonium acetate solution* 25 ml *potassium dichromate solution* and 10.0 g *urea.* Digest it at 80° for 16 hours. Filter through a sintered glass crucible. Wash the precipitate with *potassium dichromate solution* and finally with about 20 ml *water*. Dry at 105° for 2 hours. Cool and weigh. The weight of the *barium chromate* so obtained multiplied by 0.9213 represents the weight of $BaSO_4$.

History and authority : Introduced by Kent: *New Remedies* (Indian Ed. 1963), 45.

Preparation : (a) Trituration 1x — Drug strength 1/10

Barium Sulphricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method. H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : To be kept in well-closed container.

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BAROSMA CRENATA
(Bar. cren.)

Botanical name : *Barosma crenulata* Linn. **Family**: Rutaceae

Common names : *English*: Oval Buchu; *French*: Feuilles de Bucco; *German*: Bukublater.

Description : Small shrub with slender stem, which shows leaf scars in opposite and decussate pairs, internodes being about 8 to 20 mm long and marked by four longitudinal ridges, brownish, red and somewhat rough on the surface owing to the presence of oil glands. Flowers pentamerous, about 12 mm across, corolla lobe white or pinkish, narrow, acute, lanceolate. Fruit a capsule, 5-valved about 7 mm long and 10 mm wide at the apex when dehisced, surface greenish-brown and rough due to presence of oil glands; single seed in each loculus. Seeds hard, smooth, oblong-ovoid, shining black, non-endospermic.

Part used : Leaf.

Macroscopical : Leaf oval-oblong, margin serrate, apex blunt but not-recurved; petiole rigid and brittle when dry but cartilaginous when moist; surface glabrous or nearly so. Lamina punctate owing to presence of the oil glands. Also at the base of each dentation is present a marginal gland and there is one at the apex of the lamina. Odour strong aromatic somewhat peppermint like and with similar taste.

Microscopical : Mid-rib projecting below and with a shallow groove above, 4 to 5 mm thick, contains a meristele which exhibits in transverse section and are of radiate xylem with about six xylem rays. Below is narrow band of phloem, backed by a crescent of unlignified pericyclic fibres about six cell wide at the middle point; above the xylem is a small amount of parenchyma; palisade tissue is continuous above the bundle, below the bundles are few layers of parenchyma. The upper epidermis consists of polygonal tabular cells with straight anticlinal walls and possesses a fairly thick cuticle, mucilage fills the lower half of the cells most of which also contains feathery or sphaerocrystals of diosmin which is insoluble in *ammonia* but is coloured yellow by caustic *potash*; stomata absent. The lower epidermis resembles the upper but contains stomata of the anomocytic type and shows over each oil gland, a patch of modified thin walled cells. In the mesophyll there are subspherical or ovoid sehizo-lysigenous glands, up to 25 µ in diameter and also some cells, each containing a cluster crystals of calcium oxalate. The trichomes are found on the upper surface of leaf near the base of the mid-rib region and on the short petiole are unicellular conical and short, 50 to 80 µ long.

Distribution : South Africa

History and authority : Boericke: *Homoeopathic Materia Medica and Repertory*—IX, Edition, 125.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Barosma Crenuata in moderately *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

BENZINUM NITRICUM
(Benz. nit.)

Chemical formula : $C_6H_5NO_2$ **Mol. wt.**: 123.10

Common names : *English*: Nitrobenzene; *French*: Essence de mirobarue; *German*: Mirbanol.

Description : A pale yellow liquid having odour; benzaldehyde like, taste sweet. Inmmiscible with *water*, miscible with *alcohol*, *benzene* and *ether*. It solidifies at low temperature to acicular crystals melting at about 5º. Readily volatilises with steam. Contains not less than 98.0 percent of $C_6H_5NO_2$.

Identification : To 2 ml, add 0.1 g of *zinc dust* and 5 ml of *hydrochloric acid*. Cool in ice, add 4 ml of a 1 percent *solution of sodium nitrate* and the mixture is poured into 2 ml of *b-naphthol solution* containing 1 g of *sodium acetate*; a heavy dark orange red precipitate is produced.

Distillation range : Not less than 95.0 percent distills between 209° to 211°.

Wt. per ml : 1.21.

History and authority : Allen: *Encyclop. Mat. Med.*, Vol. II, 130; X, 383; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. I, 273.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Benzinum Nitricum 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

Caution : Poison! Not to be dispensed below 3x.

BERYLLIUM METALLICUM

(Be. metal.)

Chemical formula : Be **At. wt.**: 9.01

Description : A grey, lustrous, hard metal. It is soluble in *dilute hydrochloric acid*, in *dilute sulphuric acid*, in *potassium hydroxide solution* and in *sodium hydroxide solution*; almost insoluble in *acetic acid.* Contains not less than 99.5 percent of Be.

Identification : (i) One drop of the solution in a dilute acid, when treated on a spot plate with a drop of 2 N *sodium acetate* and one drop of the *yellow alcoholic chromea aurole solution*; a deep violet colour develops.

(ii) One drop of the solution in dilute acid, when mixed on a spot plate with one drop each of *saturated EDTA solution*, 10 percent *sodium hydroxide solution* and 0.02 percent *aqueous solution* of the *Beryllon II*; a blue colour develops.

Assay : Dissolve about 0.05 g in *dilute hydrochloric acid* in quantity just enough to form the solution. Add *ammonia solution* to adjust pH between 8 and 9. Filter the precipitate and transfer the contents to a beaker. Add *dilute hydrochloric acid* to dissolve the precipitate. Dilute the solution with sufficient quantity of *water* to 100 ml and adjust the pH to 2. Add 5 ml of 15 percent *diammonium hydrogen phosphate solution* and a slight excess of 15 percent *EDTA solution*; both reagent solutions having a pH of 5.5, add 0.5 M *ammonium acetate* to the resulting solution until the pH is 5.5. Digest the solution at temperature below the boiling point for 3 to 10 minutes, cool, filter the granular precipitate, redissolve the precipitate in the minimum amount of 6 N *hydrochloric acid* and reprecipitate by adding 1 ml of each of the reagent. Filter again, wash with a 0.5 M *acetate buffer* (3.5 g of *ammonium acetate* and 3.0 ml of *glacial acetic acid* per 100 ml of *water*). Ignite at 1000° and weigh as $Be_2P_2O_7$. Each g of $Be_2P_2O_7$ is equivalent to 0.0938 g of Be.

History and authority : Proved by Templeton, *Brit. Hom. Journ.*, 43, 79, in 1953.

Preparation : (a) Trituration 1x — Drug strength 1/10

Beryllium Metallicum	100 g
Saccharum Lacits	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

BRACHYGLOTTIS REPENS

(Brc. rep.)

Botanical name : *Brachyglottis repens* Forst. **Family**: Compositae (Asteraceae)

Description : A shrub, up to 7 m in height with large board, deeply toothed, glossy leaves, dawny on under surface. Flower-heads numerous, small, yellow in terminal panicles.

Part used : Leaf with flower.

Microscopical : Leaf in transection dorsiventral and consist of a lamina with a single layered epidermis. Trichomes absent from the upper epidermis, while a dense growth of T-shaped, trichomes with blackish-brown single celled stock present in lower epidermis; stomata only on lower surface, single layer of collenchyma cells below the upper epidermis, palisade single layered, spongy parenchyma 4 to 5 layered; veins, each consisting of a conjoint, collateral bundle with sclerenchyma patches on both sides and covered by a lignified bundle sheath. Midrib consists of a single layered epidermis, 4 to 8 layered collenchyma; ground tissue of oval isodiametric parenchyma cells and a stele of single or double arc. The single arc stele consists of separate collateral-conjoint vascular bundles each containing abaxial phloem and covered all around by sclerenchymatous sheath; medullary and accessory bundles also present, when double arched, it consists of one arc reverse the other; the upper ventroconvex while the lower dorsoconvex each encircled by sclerenchyma.

Distribution : New Zealand.

History and authority : Introduced by Ficher, in 1870 *H.A.J. of Hom.* Vol. IX, 1878, 41; Allen: *Encyclop. Mat. Med*., Vol. X, 385; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 303; Hering: *Guiding Symptoms*, Vol. II, 499.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Brachyglottis Repens in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

BRANCA URSINA
(Branca)

Botanical name : *Heracleum sphondylim* Linn. **Family**: Umbelliferae (Apiaceae)

Common names : *English*: Bears Breach; *French*: Berce, Gereine Barenklau.

Description : Biennial to perennial herb with a large fusiform branching root, yellowish externally, whitish internally. Stem stout, l to 3 m tall, more or less pubescent or even, tomentose. Leaves pinnatifid with large sheathing petiole, leaflets with 3 to 5 lobes. Terminal umbel 10 to 20 cm wide; primary rays 15 to 30. Fruit obovate or somewhat of obcordate, about 10 mm long and nearly as wide, often pubescent.

Part used : Whole plant.

Identification : (1) Carryout TLC of the *chloroform* extract on silica gel 'G' using *cyclohexane* : *acetone* (9 : 1 v/v) as mobile phase; under UV light ten spots appear, at R_f 0.05, 0.10, 0.16 (all blue), 0.23 (red), 0.27 (grey), 0.35 (yellow), 0.48, 0.56, 0.72 and 0.89 (all blue). On spraying with *potassium permanganate*, six spots appear at R_f 0.05, 0.23, 0.35 (all white), 0.48 (yellow), 0.78 (greenish-yellow) and 0.96 (yellow) in pink background.

(2) Carryout TLC of *chloroform* layer on silica gel 'G' using *cyclohexane* : *acetone* (9 : 1 v/v) as mobile phase. On spraying with *Dragendorff's reagent*, three red spots appear at R_f 0.05, 0.10, 0.16.

Distribution : Europe and North America.

History and authority : Introduced and proved by Rosenburg, *Archiv. F. Hom.* 17, 46; Allen: *Encyclop. Mat. Med*., Vol. IV, 588.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Branca Ursina in *coarse power*	100 g
Purified Water	200 ml
Strong Alcohol	830 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CALCAREA MURIATICA

(Cal. mur.)

Chemical formula : $CaCl_2$ **Mol. wt.**: 110.99

Common names : *English*: Calcium chloride; *French*: Chlorure de calcium; *German*: Chloraleium.

Description : White cubic crystals, granules or fused masses, very deliquescent; odourless; taste saline and bitter. Fuses at red heat without any decomposition. Freely soluble in *water* and in *alcohol*. Contains not less than 98.0 percent of $CaCl_2$ calculated with reference to substance dried to constant weight at 200°.

Identification : Yields reactions characteristic of *calcium* and of *chlorides*.

Free alkali : A solution containing 2 g in 20 ml of *water* is not more than slightly turbid and requires for neutralisation not more than 2.0 ml of 0.1 N *hydrochloric acid* using *bromothymol blue* as indicator.

Heavy metals : Not more than 20 parts per million, H.P.I., Vol. I,

Iron : 4 g complies with the *limit test for iron*, H.P.I., Vol. I,

Loss on drying : Loses not more than 10.0 percent of its weight, when dried to constant weight at 200°.

Sulphates : 5 g complies with the *limit test for sulphates*, H.P.I., Vol. I,

Assay : Dissolve about 3 g accurately weighed, in sufficient *water* to produce 500 ml; dilute 25 ml to 50 ml with *water*, add 5 ml of 0.05 M *magnesium sulphate* and 10 ml of strong *ammonia ammonium chloride solution*. Tritrate with 0.05 M *di-sodium acetate*, using mordant black mixture as indicator. From the volume of 0.05 M *di-sodium acetate* required, substract the volume of 0.05 M *magnesium sulphate* added. Each ml of the remainder is equivalent to 0.00555 g of $CaCl_2$.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. X, 646; Clarke: *A Dict. of Practical Mat. Med*., Vol. I, 357.

Preparation : (a) Trituration 1x — Drug strength 1/10

Calcarea Muriatica	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted into liquid 8x, H.P.I., Vol. I,

Revised Monograph Appeared in HPI Vol. VIII

CALTHA PALUSTRIS
(Cal. pal.)

Botanical name : *Caltha palustris* Linn. **Family**: Ranunculaceae

Common names : *English*: Marsh marigold; *French*: Populage; *German*: Kuhblume.

Description : A perennial herb. Stem hollow, 20 to 60 cm long, branched above, basal leaves long petioled, the upper one progressively shorter petioled and uppermost nearly or quite sessile. Flowers bright yellow, on short or enlarged peduncle. Sepals elliptic to obovate. Anthers linear-oblong or lanceolate-oblong, about 2 mm long. Follicles, in bunches of 1 to 12, 10 to 15 mm long, abruptly or gradually narrowed into divergent style.

Part used : Whole plant.

Identification : Take 10 g, extract with 100 ml of 50 percent *alcohol*, evaporate the extract on water bath and extract the residue with *chloroform*. Carryout TLC on Silica gel 'G' using *chloroform : methanol* (9 : 1 v/v) as mobile phase. Under UV light four spots appear at R_f 0.11 (green), 0.36 (blue), 0.50 (yellow) and 0.88 (blue) with fluorescence.

Distribution : India in Himalayas at high altitude; North America, Cannada and temperate Asia.

History and authority : Asllen: *Encyclop. Mat. Med.*, Vol. II, 421.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Caltha Palustris, moist magma containing solid 100 g, plant moisture 400 ml	500 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies : 2x to contain one part of Mother Tincture, three parts of Purified Water, six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Original Monograph Appeared in HPI Vol. I

CHAMOMILLA
(Cham.)

Botanical name : *Marticaria chamomilla* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: German Chamomilla; *French*: Chamomille.

Description : A branched, annual herb, up to 60 cm. Leaves alternate, tripinnately divided below and bipinnate above, with filiform lobes. Flower heads having few white ligulate florets and numerous yellowish-orange to pale-yellow tubular on disk florets on conical, hollow receptacles, the latter up to 10 mm in breadth; disk or tubular florets perfect and without pappus; ray or ligulate florets from 10 to 20 pistillate; corolla of ligulate flowers, white, 3-toothed and 4-veined; involucre hemispherical compressed of about 20 to 30 imbricate, oblanceolate and pubescent scales; peduncles light-brown to dusky greenish-yellow; achenes more or less obovoid and faintly 3 to 5 ribbed; pappus none or only a slight membranous crown; odour characteristic and fragrantly aromatic; taste aromatic and bitter.

Part used : Whole plant.

Microscopical : Powder: moderate yellowish-brown to light olive-brown, fragments of corolla from ligulate florets with papillate epidermal cells, some epidermal cells of corolla with short-stalked, glandular hairs; numerous spinose or somewhat triangular pollen grains up to 25 µ in diameter with prominent conical projections of outer wall and 3 pores, papillose fragments of stigmas, the upper end being papillae; fragments of collapsed parenchyma; fragments of fibrovascular bundles with spiral annular and reticulate tracheae and sclerenchyma fibres; fragments of involucral bracts with epidermis having elliptical stomata up to 30 µ in length, also tracheae and fibers; fragment of achene tissue with epidermal cells having scalariform markings or wavy longitudinal walls and parenchyma containing rosette aggregates of calcium oxalate; fragments of characteristic tissue of anthers composed of elongated cells with scalariform walls.

Distribution : India, Asia and Europe.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. III, 89.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Chamomilla, moist magma containing solids 100 g and plant moisture 500 ml	600 g
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

CHLOROFORMUM
(Chlorf.)

Chemical formula : $CHCl_3$ **Mol. wt.**: 119.4

Common name : *English*: Chloroform.

Description : Colourless, volatile liquid, odour characteristic; taste sweet and burning. Freely miscible with *alcohol* and *ether;* very slightly miscible with *water*. It is heavier than *water*. Pure chloroform is light sensitive and therefore 0.5 to 1 percent *alcohol* is added as stabiliser.

Identification : (1) Non inflamable. In Bunsen flame, produces a green colour and gives noxious vapours having a characteristic odour.

(2) Warm one drop with one drop of *aniline* and 1 ml of *sodium hydroxide solution*; extremely poisonous phenyl isocyanide with foul odour is produced.

Wt. per ml : 1.47 g, H.P.I., Vol. I,

Boiling point : 61°.

Acidity : Shake 10 ml with 20 ml of freshly boiled and cooled *water* for 3 minutes and allow to separate. To a 5 ml of the aqueous layer, add 0.1 ml of *solution of litmus*; the colour produced is not different from that produced on adding 0.1 ml of solution of *litmus* to 5 ml of freshly boiled and cooled *water*.

Non-volatile : 25 ml, when evaporated and dried to constant weight at 105°, leaves not more than 1 mg of residue.

History and authority : Proved by Lambke, *A.H.Z.* 39, 369; Allen: *Encyclop. Mat. Med.*, Vol. III, 263; Hering: *Guiding Symptoms,* Vol. IV, 98.

Preparation : (1) Mother Tincture ϕ Drug strength 1/10

Chloroformum	100 ml
Strong Alcohol	900 ml

to make one thousand millilitres of the Mother Tincture.

(2) Potencies: 2x and higher with *Dispensing Alcohol*.

Storage : Preparation below 6x to be kept in well-closed containers protected from light.

CHLORUM
(Chlorum)

Chemical formula : Cl_2 **Mol. wt.**: 71.90

Common names : *English*: Chlorine; *French*: Chlore; *German*: Chlor.

Description : Chlorum is a greenish-yellow, clear *chlorine water* containing at least 0.4 percent chlorine having suffocating odour.

Identification : (1) It gives reaction characteristic of *Acidum hydrochloricum*, H.P.I., Vol. I,

(2) When treated with *potassium iodide solution*, it evolves *iodine*.

Arsenic : Not more than 1 part per million, H.P.I., Vol. I,

Lead : Not more than 5 parts per million, H.P.I., Vol. I,

Residue on evaporation : Leaves not more than 0.001 percent of v/v of residue when evaporated to dryness on a water bath and dried to constant weight at 105°.

Assay : Take 100 ml in an iodine flask, add through stoppered funnel excess of *potassium iodide solution*. Shake for five minutes and titrate the liberated *iodine* so evolved with 0.1 N *sodium thiosulphate solution* using *starch* as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.003456 g of Cl_2.

History and authority : Proved by Hering, *Archives*, 2, 3, 165; Allen: *Encyclop. Mat. Med.*, Vol. IV, 102.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Chlorum, containing 0.4 percent Chlorine	250 ml
Purified Water	750 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 4x with Purified Water. 5x and higher with *Dispensing Alcohol*.

Storage : Preparations below 6x to be kept in well-closed containers protected from light.

Caution : Preparation below 6x to be freshly made.

CHRYSAROBINUM

(Chrys.)

Common names : *English*: Chrysarobin; *French*: Chrysarobine; *German*: Chrysarobin.

Description : A neutral principle in its impure commercial form extracted from Goa powder, a substance found deposited in cavity of the trunk of *Andira araroba.* Aquiar of family Leguminosae (Fabaceae). It consists of 70 to 85 percent of *anthraquinone* derivatives. Brownish-yellow to orange yellow, microcrystalline powder; odourless; tasteless. Very slightly soluble in *water*, slightly soluble in *alcohol*.

Identification : (i) Dissolve 0.1 g in 5 ml of *potassium sodium hydroxide solution*, a dark brownish-red solution produced; 5 drops of this solution when diluted with 10 ml of *water* shows a green fluorescence.

(ii) Mix about 1 mg on a white tile with a drop of fuming *nitric acid*; a brownish-red liquid is produced; add a drop of *dilute ammonia solution*, an evanescent violet colour is produced at the surface of contract.

Reaction : Alcoholic solution is neutral to *litmus*.

Ash : Not more than 0.8 percent.

History and authority : Boericke: *Homoeopathic Materia Medica and Reportory*, 9th Edn.

Preparation : (a) Trituration 1x — Drug strength 1/10

Chrysarobinum in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I, .

Revised Monograph Appeared in HPI Vol. X

CINERARIA MARITIMA

(Cin. mar.)

Botanical name : *Senecio cineraria* D.C. **Family**: Compositae (Asteraceae)

Synonym : *Cineraria maritima* Linn.

Common names : *English:* Dusty miller.

Description : A perennial shrub, up to 75 cm high, branching from the base, very white, woolly throughout, especially under the leaves. Leaves pinnatified with oblong and obtuse segments. Head usually radiates 0.6 to 1.25 cm high, disposed in small compact cymes. Ray florets yellow, but the colour is eclipsed by the whole plant which appear as whitish bloom.

Part used : Whole plant.

Microscopical : Leaf: epidermal cells covered with cuticle, lower epidermal cells covered with thick growth of long unicellular trichomes. Upper epidermis followed by 2 to 3 layers of palisade cells. Below palisade is present spongy parenchyma. In midrib the lower epidermis is followed by chlorenchyma tissue. Vascular bundles encircled by sclerenchymatous bundle sheath. Ground tissue parenchymatous. Petiole cordate in outline bearing palisade like epidermal cells, radially elongated with heavy thickening on outer tangential walls. Trichomes numerous, uniseriate, whip-like forming a web-like covering on epidermal cells. Collenchyma 6 to 7 layered at the ridge; chlorenchyma 1 to 4 layered present at furrows; vascular bundles in a ring in parenchymatous ground tissue; stone cells with pits numerous, scattered throughout the ground tissue.

Identification : Evaporate 10 ml of succus on water-bath to remove alcohol, extract the residue with 10 ml *chloroform* after making it alkaline with *strong ammonia solution* and separate the chloroform layer. Carry out TLC of chloroform layer on silica gel 'G' using *ethanol* : *ammonia* (100 : 1.6 v/v) as mobile phase, two spots appear at R_f 0.93 and 0.95 on spraying with *Dragendorff's reagent.*

Acidity : Near neutral.

Assay : Take 25 ml of succus and evaporate alcohol, extract with *chloroform* making it alkaline with *ammonia*; evaporate combined chloroform extract and dissolve it in 10 ml 0.1 N *hydrochloric acid*. Titrate the excess *hydrochloric acid* with 0.1 N *sodium hydroxide*. Each ml of 0.1 N *hydrochloric acid* will be equivalent to 0.0134 mg. Total alkaloid with reference to senacelonine should not be less than 0.085 percent weight by volume.

Distribution : Mediterranean region, also being cultivated in India.

History and authority : Boericke: *Mat. Med. and Repertory*, 9th Ed., 210; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 525.

Preparation : I. (a) Mother Tincture ϕ — Drug strength 1/10

Cineraria Maritima in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

II. Succus:

Extracted juice	87 per cent
Strong Alcohol	8 per cent
Glycerine	5 per cent
Phenyl mercuric nitrate	0.001 per cent

Revised Monograph Appeared in HPI Vol. VII

COCAINUM MURIATICUM
(Coca. mur.)

Chemical formula : $C_{17}H_{21}NO_4HCl$ **Mol. Wt.**: 339.81

Common name : *English:* Cocaine hydrochloride.

Description : Colourless crystals or white crystalline powder; hygroscopic. Odourless; taste bitter and numbing. Very soluble in *water*. Freely soluble in *alcohol*, *glycerin* and soluble in *chloroform;* almost insoluble in *ether* and insoluble in fixed oils.

Identification : (1) To 50 mg add 1.5 ml of *water*, shake well, add 8.5 ml of *solution of alum,* 5 ml of *solution of potassium permanganate* and stir briskly for sometime; characteristic rectangular violet plates are formed.

(2) Yields the *reactions* characteristic of *chlorides*.

Melting range : 195° to 197°.

Acidity : Dissolve 0.5 g in 10 ml of *water* and titrate with 0.02 N *sodium hydroxide*, using *methyl red* as indicator; not more than 0.5 ml is required.

Specific rotation : In a 2 percent w/v solution, − 70° to 72°.

Loss on drying : Loses not more than 1.0 percent of its weight when dried over *phosphorus pentoxide* for three hours.

Sulphated ash : Not more than 0.1 percent.

History and authority : Boericke: *Materia Medica with Reportory*; Allen: *Encyclop. Mat. Med.,* Vol. III, 369; Hering; *Guiding Symptoms,* Vol. IV, 244.

Preparation : (a) Trituration 1x — Drug strength 1/10

Cocainum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted into liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x to be kept in well closed containers.

Caution : Not to be dispensed below 3x.

COMOCLADIA DENTATA

(Com. dent.)

Botanical name : *Comocladia dentata* Jacq. **Family**: Anacardiaceae

Common names : *English*: Guao; *French*: Comoclade; *German*: Die Astlose.

Description : An evergreen shrub, 1.2 to 2.4 m high, trunk erect not much branched. Top branches tufted. Leaves pinnate, leaflets 6 to 10 pairs with an old terminal one, acute, toothed, with a brownish tinge at the margin, shining green above, downy beneath. Flowers small, bluish-brown in clusters, appearing in July. All the parts emit a milky, glutinous juice; becoming black by exposure, staining linen or skin indelibly. If the tree be wounded it emits an odour of dung.

Part used : Leaf and bark.

Identification : Take 10 g, extract with 100 ml 80 percent alcohol, evaporate 20 ml of the extract and extract the residue with *chloroform* and separate the two layers.

(1) Carry out TLC of *chloroform* extract on silica gel 'G' using *benzene* : *methanol* (95 : 5 v/v) as mobile phase and *antimony trichloride solution* as spraying reagent. Two spots appear at R_f 0.65 (pinkish-violet) and 0.75 (pinkish-brown).

(2) Carry-out TLC of aqueous extract over silica gel 'G' using n-*butanol* : *acetic acid* : *water* (4 : 1 : 1 v/v) as mobile phase; under UV light one spot appears at R_f 0.82 (blue fluorescence).

(3) To 1 ml of the extract add 1 drop of 5 percent *ammonium molybdate* solution; a cream coloured precipitate is produced.

Distribution : Cuba and San Domingo.

History and authority : Proved by Howard, *Phil. J. of Hom.* IV, 74; Allen: *Encyclop. Mat. Med*., Vol. III, 509, Vol. X, 478.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Comocladia Dentata in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	830 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

CURCUMA LONGA
(Curcuma)

Botanical name : *Curcuma longa* Linn. **Family**: Zingiberaceae

Common names : *Hindi:* Haldi; *English:* Turmeric.

Description : A perennial herb; rhizome erect, bearing fleshy ovate or pyriform or elongated branches (secondary rhizomes), roots and leaves. Leaves oblong-lanceolate, tapering to the base, up to 1.2 m or more, arising in tufts; the petiole about as long as the blade. Flowers in terminal spikes 10 to 15 cm long, peduncles 15 cm or more concealed by the sheathing petiole, flowering bracts pale green tinged with pink.

Part used : Rhizome.

Macroscopical : Ovate, oblong or pyriform (round turmeric) or cylindrical to elongated and often short branched (long turmeric); the round form half as broad as long, the long form, 2.5 cm long and 1 to 1.8 cm in diameter; externally yellowish to yellowish-brown, with root scars and annulated due to scars of the leaf bases; fracture horny, internally orange-yellow to orange, waxy, showing a cortex separated from a central cylinder (about twice as broad as cortex) by a distinct endodermis; in both cortex and central cylinder scattered bundles are present. Odour aromatic; taste characteristic aromatic and bitter.

Microscopical : Epidermis single layered of rectangular cells; wide cortex composed of oval, isodiametric cells containing starch grains also present large sac-shaped idioblasts containing yellowish curcumin starch, endodermis single layered of large dumbbell-shaped thick walled cells, a wide ground tissue of oval or isodiametric parenchyma cells; scattered conjoint collateral vascular bundles, numerous idioblasts, starch grains which are 28 to 36 µ by 10 to 12µ. Transverse section turns deep crimson red when treated with *alcoholic sulphuric acid.*

Distribution : Cultivated throughout India.

History and authority : Introduced and proved by Arya, Balachandran and Augustine, *Hahnemannian Gleanings,* XLIV, No. 7, 1977, 320-30.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Curcuma Longa in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of Mother Tincture, three parts of Purified Water and six parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

CYPRIPEDIUM PUBESCENS
(Cypr. pub.)

Botanical name : *Cypripedium pubescene* Willd. **Family**: Orchidanceae

Synonym : *Cypripedium luteum* Franch.

Common names : *English*: Lady's slipper; *French*: Valeriane americaine; *German*: Galbrauenschuh wurzel.

Description : A perennial horizontal plant, the leaf scars present on upper region of the rhizome but with many fibrous rootlets present below. Stem pubescent 30 to 60 cm high, erect and leafy. Leaves alternate, pubescent, large, ovate, lanceolate, sheathing at base. Flowers large, yellow, odourless, terminal, solitary or in pairs.

Part used : Rhizome.

Distribution : United States.

History and authority : Introduced by Hale, *New Remedies;* Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 653; Hering: *Guiding Symptoms*, Vol. V, 78.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Cypripedium Pubescens in *coarse powder*	100 g
Purified water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

DUBOISIA MYOPOROIDES
(Dub. myop.)

Botanical name : *Duboisia myoporoides* R. Br. **Family**: Solanaceae

Common name : *English*: Cork-wood tree.

Description : A tall shrub or small tree, quite glabrous. Leaves alternate, obovate-oblong to oblong-lanceolate, obtuse or rarely acute and entire; petiole 5 to 10 cm long. Panicles terminal, sometimes leafy at the base, usually much branched broadly pyramidal or corymbose; bracts minute; calyx broadly campanulate with broad obtuse teeth. Flowers arranged in terminal white or pale lilac centrifugal panicles and have four didynamous stamens with reniform anthers with lobes rather short and obtuse; stamens included in the tube. Fruit an indehiscent black berry, small and nearly globular.

Part used : Leaf.

Macroscopical : Leaf about 25 to 100 cm long, with a length-breadth ratio of about 3 or 4 to 1, lamina simple, pinnately veined; midrib prominent on both surfaces, lateral veins anastomosing near the margin, which is entire and slightly revolute; apex acute or sometimes obtuse and somewhat emarginate, base acute, outline oblanceolate, the surface is nearly glabrous and texture thin and brittle. Petiole short, the phyllotaxis alternate. Odourless; taste very slightly bitter.

Microscopical : Lamina in transection, consists of single layered epidermis of tabular cells followed by a layer of palisade cells, spongy parenchyma of 8 to 10 cells containing several idioblasts. Midrib, pronounced adaxially with a single layered epidermis of tabular cells followed by 2 to 4 layered collenchyma of angular cells, a wide parenchymatous medulla containing a central arc-shaped stele with phloem on both sides; idioblasts numerous, scattered in medula and phloem. In the surface view, epidermal cells from both surfaces bear distinct striations, anisocytic stomata and glandular stalked trichomes. Petiole club-shaped in outline and consisting of a single layered epidermis of tabular cells covered with cuticle, followed by a parenchymatous ground tissue containing arc-shaped stele consisting of exarch xylem encircled on both aspect by phloem. Parenchyma cells oval, isodiametric, containing inter-cellular spaces. Powdered leaf consists of multicellular glandular trichomes 60 to 78 µ into 16 to 20 µ, thick-walled, cuticularised, striated epidermal cells 32 to 64 µ into 28 to 40 µ, anisocytic stomata 16 to 20 µ diameter. Palisade cells, 20 to 28 µ in diameter, spiral vessel 8 to 12 µ in diameter. Palisade ratio 1.25 to 1.50; stomatal number 10 to 15 per sq. mm for upper epidermis and 25 to 30 per sq. mm for lower epidermis.

Identification : Evaporate 10 ml of alcoholic extract (10 g is extracted with 100 ml 70 percent *alcohol*) on water-bath to remove *alcohol*. Extract the aqueous solution with 15 ml of *chloroform*. Carry out TLC of *chloroform* layer over silica gel 'G' using *methnol : ammonia* (100 : 1.5 v/v) as mobile phase and acidified *iodoplatinate* as spray reagent; three more sports appear on standing after 24 hrs. at R_f 0.07, 0.19 and 0.34. Spots at R_f 0.19 and 0.55 correspond with *hyoscyamine* and *hyoscine* respectively.

Distribution : New South Wales and Queensland, Australia, New Calendania.

History and authority : Introduced by Helfrich *N.A.J.H.,* XIII, 267; proved by Norii, *A.J.*, 447, 1887; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 682.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Dubosia Myoperoides in *coarse powder*	100 g
Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

EPIPHAGUS VIRGINIANA

(Epi. vir.)

Botanical name : *Epiphagus virginiana* (Linn.) Bart. **Family**: Orobanchaceae

Synonym : *Orobanche virginiana* Linn.

Common names : *English*: Beechdrop; *French*: Orobanche de virginie; *German*: Krebwur.

Description : Parasite on the roots of Beech. Stem pale-brown, usually marked with fine brownish-purple lines, 10 to 50 cm tall, with numerous, elongate ascending branches. Leaf scales triangular, ovate, 2 to 4 mm long. Lower flowers about 5 mm long, upper flowers about 1 cm long, corolla white, commonly with two strips of brownish-purple. Capsule somewhat oblique, about 5 mm long, dehiscent across the top.

Part used : Whole plant.

Identification : (1) To 1 ml of the 60 percent alcoholic extract, add two drops of *lead acetate* solution; a cream coloured solution with turbidity is formed.

(2) To 2 ml of the alcoholic extract, add two drops of *copper sulphate* solution; a green colour is produced.

(3) To 2 ml of the alcoholic extract, add one drop of *phloroglucinol* / *hydrochloric acid*; a turbidity with light orange colour is produced.

Distribution : North America.

History and authority : Proved by Morlen and introduced by Jones; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 706.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Epiphagus Virginiana in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, three parts Purified Water; six parts *Strong Alcohol*, 3x and higher with *Dispensing Alcohol*.

EUPHORBIA COROLLATA

(Euphor. c.)

Botanical name : *Euphorbia corllata* Linn. **Family**: Euphorbiaceae

Synonym : *Tithymalopsis corollata* Klbtzsch & Garcke.

Common names : *English*: Blooming spurge; *French*: Euphorbe; *German*: Wolfs.

Description : A perennial herb, up to 1 m in height, usually glabrous, slender and diffusely branched above, having milky, acrid juice. Leave ovate-oblong or lanceolate, 2.5 to 5 cm long, those of inflorescence much smaller and opposite; involural glands 5, with conspicuous white appendages. Flowers in auxilliary and terminal branches of 5 to 7 rays, each 2 to 3 forked.

Part used : Root.

Microscopical : Cork thick, homogenous; secondary cortex broad, amyliferous containing laticiferous canals. Xylem in narrow radiating groups, containing reticulate tracheae surrounded by fibres, xylem groups separated from each other by broad parenchyma rays.

Identification : Take 10 g, extract with 100 ml of 50 percent *alcohol*, evaporate 25 ml of the extract on water-bath and extract the residue with *chloroform*. Carry out TLC of *chloroform* extract over silica gel 'G' using *benzene* : *methanol* (95 : 5 v/v) as mobile phase. Under UV light it shows three spots with blue fluorescence at R_f 0.59, 0.82 and 0.96. After spraying with *antimony trichloride solution* and heating, six spots appear at R_f 0.07 (pink), 0.17 (yellowish-brown), 0.51 (pink), 0.82 (brown), 0.88 and 0.93 (both pink).

Distribution : North America.

History and authority : Proved by Hale, *H. Am. Journ. of Hom.*, 11, 49, 1862; Allen: *Encyclop. Mat. Med.*, Vol. IV, 224.

Preparation : (a) Mother Tincture ϕ

	Drug strength 1/10
Euphorbia Corollata in *coarse powder*	100 g
Purified water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water; five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

EUPIONUM
(Eupion)

Description : A colourless, transparent light oil; tasteless and having a flower-like odour. It is miscible with *water*, *alcohol*, *ether*, fixed and volatile oils. It volatilises appreciably at ordinary temperature. It remains unchanged by acids and alkalies but reacts without decomposition with bromine, iodine and chlorine. It is obtained from wood tar during the process of distillation.

Wt. per ml : 0.65 at 20°.

Boiling range : 34° to 36°.

History and authority : Introduced and proved by Wahle and Bertoldi, *Int. Hom. Presse*, V, 91; Allen: *Encyclop. Mat. Med*., Vol. IV, 266; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 743.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Eupionum	100 ml
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Strong Alcohol*; 6x and higher with *Dispensing Alcohol*.

Caution : Preparation below 4x to be freshly made.

FERRUM MAGNETICUM
(Fer. mag.)

Chemical formula : Fe_3O_4 **Mol. wt.**: 231.55

Common names : *English*: Magnetic oxide of iron; *French*: Oxyde ferrose ferrique; *German*: Eisenoxydoxydul.

Description : A brown black, odourless, tasteless powder. When strongly heated in air, it is transformed into *red ferric oxide.* It has magnetic property and is more stable than other oxides of iron; soluble in mineral acids, insoluble in *water* and *alcohol.* Prepared from a mixture of ferrous and ferric salts in equal proportions and in excess of *sodium hydroxide.*

Identification : (1) Yields reactions characteristic of iron, H.P.I., Vol. I,
(2) Possesses magnetic property.

Assay : Dissolve about 0.5 g accurately weighed in 20 ml of *dilute hydrochloric acid,* 10 ml of *potassium iodide solution* and keep in dark for fifteen minutes; titrate the liberated *iodine* with 0.1 N *sodium thiosulphate* using *starch* as indicator until the solution becomes colourless. Each ml of 0.1 N *sodium thiosulphate* used is equivalent to 0.023155 g of Fe_3O_4.

History and authority : Introduced by Casperi, *Jahr manual of Hom. Medicine;* Allen: *Encyclop. Mat. Med.,* Vol. X, 522; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. I, 764.

Preparation : (a) Trituration 1x — Drug strength 1/10

Ferrum Magneticum in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted into liquid 8x, H.P.I., Vol. I,

GAULTHERIA PROCUMBENS

(Gal. proc.)

Botanical name : *Gaultheria procumbens* Linn. **Family**: Ericaceae

Common names : *English*: Wintergreen; *French*: The dee canada; *German*: Canadischer Thee.

Description : A small shrub. Stem creeping, giving erect branches, up to 15 cm high bearing towards their ends. Leaves dark-green, oval or obovate, almost glabrous, 2.5 to 5 cm long, with ciliate teeth. Flowers solitary, nodding; corolla ovate, white, about 5 mm long; calyx saucer-shaped. Fruit berry bright red, 7 to 10 mm in diameter.

Part used : Leaf.

Microscopical : Leaf isobilateral, mesophyll bearing mostly paracytic stomata on lower epidermis, groups of sclerenchyma at the margins; vascular bundles accompanied by few layers of fibres. Petiole exhibits a single concentric vascular strands; cortical region often tending to be composed of cells of very unequal size, thus giving a spongy appearance in transverse section.

Distribution : Northern United States from Georgia to New Foundland and in Canada.

History and authority : Proved and introduced by Gallaher, Townsend and Hooker; Allen: *Encyclop. Mat. Med*., Vol. IV, 384; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 804.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Gaultheria Procumbens in *coarse powder*	100 g
Purified Water	215 ml
Strong Alcohol	815 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

GENTIANA CRUCIATA

(Gent. c.)

Botanical name : *Gentiana cruciata* Linn. **Family**: Gentianaceae

Synonym : *Cruciata verticillata* Gilib.

Common names : *English*: Crosswort gentiana; *French*: Gentiane Croisette; *German*: Kreuze Eozain.

Description : An erect and leafy perennial herb. Stem smooth. Leaves opposite, sessile, ovate-lanceolate, crowded, the upper connate-perfoliate, internodes equal. Flowers axillary in sparse clusters, dark blue.

Part used : Root.

Identification : Take 10 g and extract with 100 ml of 60 percent *alcohol*. Carry out TLC of chloroform extract on silica gel 'G' using *chloroform* : *methanol* (95 : 5 v/v) as mobile phase. With *antimony trichloride* as spray reagent it gives six spots at R_f 0.98 (brown), 0.94 (pink), 0.71 (dark blue), 0.40 (pink), 0.34 (pink), 0.21 (pink).

(1) Carry out TLC of aqueous extract on silica gel 'G' using *n-butanol* : *acetic acid : water* (4 : 1 : 1 v/v) as mobile phase and with *aluminium trichloride solution* as spray reagent, under UV light three spots appear at R_f 0.86,0.71, 0.56 (all yellow).

(2) Carry out TLC of aqueous extract on silica gel; 'G' using *n-butanol* : *acetic acid* : *water* (4 : 1 : 1 v/v) and *aniline-phthalate* as spray reagent; three spots appear at R_f 0.31, 0.56, 0.66 (all brown).

(3) Carry out TLC of *chloroform* extract after making alkaline with *ammonia* on silica gel 'G' using *methanol* : *ammonia* (100 : 1.5) as mobile phase and *Dragenderffs reagent* as spray reagent. One spot appears at R_f 0.81.

Distribution : North and Central Europe, Asia minor, Turkistan and W. Siberia.

History and authority : Proved and introduced by Watz ke. *Oest. Zeit. F. Hom*., I, 2, 133, in 1845; Allen: *Encyclop. Mat. Med*., Vol. IV, 404; Clarke: *A Dictionary of Practical Mat. Med*., Vol. I, 815.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Gentiana Cruciata in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

GRATIOLA OFFICINALIS
(Grat. off.)

Botanical name : *Gratiola officinalis* Linn. **Family**: Scrophulariaceae

Common names : *English*: Hedge hyssop; *French*: Gratiole; *German*: Gnadenkrant.

Description : A perennial, deciduous herb with a creeping, scaly rhizome. Stem 30 cm high. Leaves opposite, sessile, three nerved lanceolate, serrate, smooth, pale-green. Flowers whitish or reddish, solitary, axillary, tubular, corolla two lipped with yellow hairs in the tube. Odourless; taste an acrid bitter.

Part used : Whole plant.

Microscopical : Stem: ridged and furrowed in outline. Epidermis single layered with sinuous radially elongated cells; cortex parenchymatous with large intercellular spaces; endodermis distinct, single layered; pericycle of isolated strands of selerenchyma fibres; phloem small; xylem in a closed cylinder with vessels mostly less than 40 µ. Medullary rays absent; centre hollow.

Powder: with both thin and thick-walled fibres, tapering at ends or blunt on the other vessels with annular or spiral, annulo-spiral, thickenings; fragments of hexagonal sclerenchyma cells; parenchyma cells variously shaped, oval 15 to 100 µ by 9 to 56 µ elongated, being rectangular up to 120 µ by 4 µ hexagonal 46 to 88 µ by 28 to 40 µ.

Leaf: dorsiventral with upper and lower epidermal cells with sinuous anticlinal walls; stomata on the lower epidermis only anomocytic. Trichomes, abundant on both sides, of two types viz. multicellular uniseriate non-glandular and glandular with head 1 to 4 celled and stalk single celled. Palisade 1 to 2 layered extending a little inside midrib; spongy parenchyma 3 to 4 cells wide. Palisade ratio 3.5 to 6.0. Midrib and lateral veins with identical conjoint, collateral central vascular bundle, with fan shaped xylem consisting of vessels with spiral thickenings and simple pits; collenchyma absent.

Distribution : Central Europe, North America and Extra-tropical Australia.

History and authority : Introduced and proved by Nenning, Hartlaub and Trinks, *Reine Arzenim* 2, 1; Allen: *Encyclop. Mat. Med.*, Vol. IV, 491; Hering: *Guiding Symptoms*, Vol. V, 478.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Gratiola Officinalis in *coarse powder*	100 g
Purified Water	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*.3x and higher with *Dispensing Alcohol.*

HEDERA HELIX
(Hed. hel.)

Botanical name : *Hedera helix* Linn. **Family**: Araliaceae

Synonyms : *Hedera nepalenis* Koch, *H. himalaica* Tobler.

Common names : *English*: English ivy; *Hindi*: Lablab.

Description : A large, evergreen, woody climber with stem up to 30 cm in diameter, climbing by numerous adventitious rootlets. Leaves 5 to 10 cm long, alternate, simple, shape variable, linear lanceolate to cordate ovate usually comparatively deeply lobed when arising from vegetative shoots than arising from flowering shoots. Flowers yellowish-green, polygamous; in globose penduculate umbels; bracts triangular; pedicels stellately hairy, bracteoles minute or absent; petals 5, broad and short; calyx entire, scarcely prominent extending half-way to the ovary; stamens 5; styles united into a very short structure; berry globose, 7 to 8 cm in diameter, yellow or red; seeds 3 to 5, ovoid, the albumen deeply wrinkled.

Part used : Flowering branch.

Microscopical : In transection, stem wavy in outline, epidermis single layered covered with thick cuticle; collenchyma 4 to 5 layered; cortex parenchymatous; vascular bundle in a ring; conjoint, collateral, open with sclerenchymatous pericycle in patches above phloem; primary bundles distinct; secretory ducts numerous, scattered in cortex and pith parenchyma. Pericycle absent in stem branches from young twinges.

Petiole: wavy in outline, epidermis single layered covered with extremely thick cuticle; collenchyma 4 to 5 layered, ground tissue parenchymatous of oval isodiameteric cells; stele of 6 to 8 arc-shaped conjoint, collateral bundles capped abaxially by sclerenchymatous pericycle; secretory ducts scattered in cortical region; pith parenchymatous. Secretory ducts mostly absent in petiole of young leaves.

Leaf: epidermis single layered; collenchyma below the upper epidermis; mesophyll not well differentiated into palisade and spongy parenchyma; stomata on lower surface only. Midrib with papillose epidermis, followed by 3 to 4 layered collenchyma and ground tissue of thick walled lignified cell; secretory ducts around the horse-shoe shaped stele with abaxial phloem. In young leaves lamina lacks collenchyma, patches of lignified cells present below the abaxial bundles only; ground tissue parenchymatous. Palisade ratio 1.25 to 1.75 and stomatal number of lower epidermis is 40 stomata per sq. mm.

Distribution : Throughout Himalayas up to 3000 m; Khasi hills up to 1800 m. Also extending to N. Africa, Europe and from W. Asia to Japan.

History and authority : Introduced by Hahnemann, *Apotheker-Lexiken,* Leipzig I, 274 (1793); proved by Mezger, *Hom. Arznil,* 346 (1951). English translation by Whitment and Stephenson, Jou. Amer Instt. Hom., 51, 74, (1958).

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Hedera Helix, moist magma containing solids 100 g and plant moisture 400 ml	500 g
Strong Alcohol	625 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain two part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

HELIANTHUS ANNUS

(Hel. ann.)

Botanical name : *Helianthus annus* Linn. **Family**: Compositae (Asteraceae)

Common names : *Hindi*: Suraj Mukhi; *English*: Sunflower; *French*: Grand-soleil; *German*: Sonnenblume.

Description : An annual herb with erect, rough, hairy stem, up to 5 m high. Leaves 10 to 30 cm long alternate, long stalked, broadly ovate to cordate coarsely toothed, roughly pubescent on both sides. Flower heads usually 7.5 to 15 cm wide, but attaining 30 to 60 cm width under cultivation; flower head single or double, terminal on the main axis and branches; receptacles by 4 rows of bracts; ray floret yellow, surrounding a brown purple centre of discflorets; fruit achenes cylindrical; obovoid-compressed, 0.95 cm long and 0.6 cm broad, white, black or striped grey and black; pappus falling early.

Part used : Mature flower head.

Macroscopical : Ray florets bracteate, ligulate, neutral, zygomorphic, hairy, disc florets tubular actinomorphic, bisexual, calyx modified into pappus, corolla gamopetalous, hairy; stamens 5, syngenecious, epipetalous anthers bilobed, tetralocular; bicarpellary, syncarpous pistil, ovary inferior, unilocular with basal placentation. Stigma bifid.

Microscopical : Powder: parenchymatous receptacle, multiseriate and glandular hairs, broad at the base and pointed at the apex; anomocytic stomata in bracts; pollen grains 29 to 40 µ in diameter; vessels with spiral thickenings 249 to 400 µ length and 15 to 30 µ in width.

Distribution : Cultivated through India.

History and authority : Introduced and proved by Cessoles, *B.J. of Hom.* 2, 169 (trans. From Bib. Hom. de Geneva); Allen: *Encyclop. Mat. Med.,* Vol. IV, 545; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. I**,** 874.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Helianthus Annus, moist magma containing solids 100 g and plant moisture 233 ml	333 g
Purified Water	267 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

HYOSCYAMINUM
(Hyosm.)

Chemical formula : $C_{17}H_{23}NO_3½H_2SO_4$ **Mol. wt.**: 338.4

Common name : *English: Hyoscyamine hemi* sulphate.

Description : White odourless, crystalline powder; taste bitter. Freely soluble in *water* and *alcohol.* Contains not less than 98.0 percent and not more than equivalent of 101.0 percent of $C_{17}H_{23}NO_3½H_2SO_4$ with reference to the substance dried to constant weight at 105°.

Identification : (i) Dissolve 2 mg in 2 ml of *alcohol*, evaporate to 0.5 ml, cool and add a drop of *fuming nitric acid,* evaporate it on a water bath, the residue is moistured with freshly prepared 3 percent w/v *alcoholic potassium hydroxide solution*; purple colour appears.

(ii) Yields reaction characteristic of *sulphates,* H.P.I., Vol. I,

(iii) Carry out TLC of a 1 percent w/v solution in 2 N *acetic acid* of silica gel 'G', using *strong ammonia solution* : *methanol* (1.5 : 100 v/v) as mobile phase. On spraying with *acidified iodoplatinate;* a reddish violet spot appears at R_f 0.4.

Melting range : 206 to 212 after drying at 100°.

Reaction : 1 percent w/v solution in *water* is acidic.

Assay : Take about 0.2 g accurately weighed and add 25 ml of *water* and 10 ml of *dilute ammonia solution*. Extract with 20 ml of *chloroform,* four times until complete extraction of Hyoscyamine is effected, washing each extract with the same 10 ml of *water*, remove the *chloroform* add 2 ml of *alcohol* and evaporate the alcohol. Dissolve the residue in 2 ml of *alcohol*, add 20 ml of 0.1 N *hydrochloric acid* and titrate the excess of acid with 0.1 N *sodium hydroxide* using solution of *methyl* red as indicator. Each ml of 0.1 N *hydrochloric acid* is equivalent to 0.03384 g of $C_{17}H_{23}NO_3 ½ H_2SO_4$.

History and authority : Introduced by Harely, *Old Veg. Neurotics*; Allen: *Encyclop. Mat. Med.,* Vol. V**,** 20; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. I**,** 938.

Preparation : (a) Trituration 2x — Drug strength 1/10

Hyoscyaminum Sulphuricum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

IODOFORMUM

(Iodof.)

Chemical formula : CHI_3 **Mol. wt.**: 393.73

Common name : *English*: Iodoform.

Description : Shining lemon-yellow crystals or powder, unctuous to touch; odour characteristic persistant and disagreeable; taste sweetish and *iodine* like. Volatile at room temperature. Its solutions decomposes in light and air liberating *iodine*. Freely soluble in *benzene* and in *acetone*; soluble in *ether*, *chloroform* and warm *alcohol*; sparingly soluble in cold *alcohol*; practically insoluble in *water*. Contains not less than 99.0 percent of CHI_3 with reference to the substance dried to constant weight over silica-gel.

Identification : On heating iodine vapours are evolved.

Reaction and clarity of solution : Shake 5.0 g vigorously with 50 ml of *water* for one minute and filter. The filterate is colourless. To 10 ml of the filtrate add 2 drops of *bromothymol blue solution*. Not more than 0.1 ml of 0.1 N *sodium hydroxide solution* is required to produce blue colour from yellow green or not more than 0.05 ml of 0.1 N *hydrochloric acid* to produce yellow colour from yellowish-green.

Sulphates : 10 ml complies with the *limit test for sulphates*, H.P.I., Vol. I,

Chloride : Shake 10 g with 50 ml of *water* and filter; 5 ml of this complies with the *limit test for chlorides*, H.P.I., Vol. I,

Ash : Not more than 0.2 percent, H.P.I., Vol. I,

Assay : Dissolve about 0.2 g, accurately weighed, in 25 ml of *alcohol* and add 25 ml of 0.1 N *silver nitrate solution*, 10 ml *nitric acid* and heat with a reflux condenser on a water bath for 30 minutes, protecting the reaction flask in dark. Wash the condenser with *water* and add 100 ml of *water*. Titrate excess *silver nitrate* with 0.1 N *ammonium thiosynate solution* using *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *silver nitrate solution* is equivalent to 0.01312 g of CHI_3.

History and authority : Proved by Underwood; Allen: *Encyclop. Mat. Med.*, Vol. V**,** 116; Hering: *Guiding Symptoms*, Vol. VI, 200.

Preparation : (a) Trituration 1x — Drug strength 1/10

Iodoformum	100 g
Sachharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : All preparations below 6x to be kept in well-closed containers protected from light.

Revised Monograph Appeared in HPI Vol. IX

JUNCUS EFFUSUS
(Juncus)

Botanical name : *Juncus effusus* Linn. **Family**: Juncaceae

Synonym : *Juncus communis* E. Mey.

Common names : *English:* Common rush; *French*: Jonc commune.

Description : A perennial grass like herb, 1 m high with matted, running, short rhizome, giving rise to thick tufts of serial stems which are finely striated and ribbed. Scape erect, cylindrical, containing soft spongy pith and at base short leaflets or leaf bearing sheaths. Culms contain subepidermal sclerenchyma strands or girders. Flowers numerous, greenish, in a sessile spreading panicle, protruding from the side of scape; anthers 3, wide as long as filaments. Seeds yellowish, about 6 mm long.

Part used : Root stock and root.

Identification : Take 10 g, extract with 100 ml of 60 percent *alcohol*. Evaporate 20 ml of the extract on water bath. Extract the residue with *chloroform* and separate the two layers.

(i) Carry out TLC of chloroform extract on silica gil ‘G’ using *benzene* : *methanol* (95 : 5 v/v) as mobile phase. Seven spots appear under UV light at R_f 0.04 (blue), 0.18 (blue); 0.26 (blue); 0.35 (yellowish-blue); 0.41 (blue), 0.74 (blue) and 0.85 (bright blue). On spraying with *antimony trichloride* it gives six spots having R_f 0.09 (blue), 0.22 (blue), 0.56 (blue); 0.70 (reddish changes to violet), 0.75 *brown) and 0.81 (brown).

(ii) Carry out TLC of chloroform extract on silica gel ‘G’ using *benzene* : *methanol* (95 : 5 v/v) as mobile phase and *aluminium chloride solution* as spray reagent. The blue coloured fluorescence having R_f value 0.18 changes to yellow.

(iii) Carry out TLC of aqueous layer on silica gel 'G' using *ethyl acetate* : *methylethyl ketone* : *formic acid* : *water* (5 : 2 : 2 : 1 v/v) as mobile phase and *aniline phthalate* as spray reagent. On heating, it gives yellowish-brown spot at R_f 0.70.

Distribution : North temperate and arctic zones.

History and authority : Proved by Wahle, *Archiv S: Hom. Hoill* XIX, 2, 183; Allen: *Encyclop. Mat. Med.*, Vol. V, 204; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 78.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Juncus Effusus in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

KALI CHROMICUM

(Kali. chr.)

Chemical formula : K_2CrO_4 **Mol. wt.**: 194.20

Common name : *English*: Potassium chromate.

Description : Lemon-yellow crystals; freely soluble in *water*, insoluble in *alcohol*. Contains not less than 99.0 percent with reference to the substance dried to constant weight at 105°.

Identification : (i) Yields reactions characteristics of *potassium* and *chromates*, H.P.I., Vol. I,

(ii) To an aqueous solution add a drop of *acetic acid-benzidine solution*; blue ring is formed.

Free alkali : Dissolve 0.5 g in 15 ml of *water* and add two drops of *phenolphthalein solution*; if a pink colour is produced, it requires not more than 0.1 ml of 0.01 N *hydrochloric acid* to discharge the colour.

Chloride : 10 g complies with the *limit test for chlorides*, H.P.I., Vol. I,

Sulphate : 5 g complies with the *limit test for sulphates*, H.P.I., Vol. I,

Assay : Dissolve about 0.25 g accurately weighed, in 200 ml of recently boiled and cooled *water*. Add 3.0 g of *potassium iodide* and 7 ml of *hydrochloric acid*. Keep in dark for 10 minutes. Titrate with 0.1 N *sodium thiosulphate* using *starch* as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.006473 g of K_2CrO_4.

History and authority : Allen: *Encyclop. Mat. Med.*, Vol. X, 562.

Preparation : (a) Trituration 1x — Drug strength 1/10

Kali Chromicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

LITHIUM BENZOICUM
(Lith. ben.)

Chemical formula : $C_7H_5O_2Li$ **Mol. wt.**: 128.05

Description : A white crystalline powder; odourless; taste sweetish and saline. Freely soluble in *water* and soluble in *alcohol.* Contains not less than 98.5 percent of $C_7H_5O_2Li$ calculated with reference to the substance dried to constant weight over *silica gel*.

Identification : (i) 10 percent aqueous solution gives buff coloured precipitate with *ferric chloride solution.*

(ii) With *dilute hydrochloric acid* yields; a white crystalline precipitate of *benzoic acid* which has melting point about 122°.

(iii) A drop of the neutral or alkaline test solution is mixed in micro test tube with a drop of a saturated solution of *sodium chloride*, followed by 2 drops of the reagent. A blank test with *water* is also done. Both tubes are dipped in *water* at 45 to 50° for 15 to 20 seconds; a yellowish-white turbidity develops in the test solution, while blank remains clear.

Arsenic : Not more than 5 parts per million.

Lead : Not more than 10 parts per million.

Assay : Dissolve about 1 g, accurately weighed, in 25 ml of *water* and neutralise the solution, if necessary, with 0.1 N *sulphuric acid solution* using *phenolphthalein* as indicator, add 25 ml of solvent *ether* and few drops of a *solution of bromophenol blue* and titrate with 0.5 N *sulphuric acid* with constant shaking, until the colour of the indicator begins to change; separate the lower layer; wash the etheral layer with 10 ml of *water* and to the separated aqueous layer add the washings and a further 20 ml of solvent *ether*; complete the titration with the 0.5 N *sulphuric acid*, shaking constantly. Each ml of 0.5 N *sulphuric acid* is equivalent to 0.06399 g of $C_7H_5O_2Li$.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 293; Blackwood: *Mat. Med*. and *Therapeutics*.

Preparation : (a) Trituration 1x — Drug strength 1/10

Lithium Benzoicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

LOBELIA CARDINALIS
(Lob. card.)

Botanical name : *Lobelia cardinalis* Linn. **Family**: Lobeliaceae

Synonyms : *Lobelia coceirnes, Trachelium americanum*.

Common name : *English*: Cardinal-flower.

Description : A deciduous, perennial herb, erect, usually branched. Stem stout, smooth or short acute or acuminate, tapering at both ends, slightly dentate, cartilaginous, lower ones short-petioled, upper smaller, nearly or quite sessile. Flowers 3 to 4 cm long, in racemes, lobular, bright intense scarlet; bracts at the base linear 8 to 12 mm long; corolla with 3 lower lobes narrow. Seeds distinctly tuberculate.

Part used : Whole plant.

Identification : Take 10 g, extract with 100 ml of 50 percent *alcohol*:

(i) To 0.5 ml of the extract, add 1 ml *potassium hydroxide* solution, dilute with *alcohol*; a bluish-violet colour is produced.

(ii) Distil 5 ml of the extract, add a few drops of *alcoholic potassium hydroxide* and *m-dinitrobenzene* followed by the addition of few drops of *sodium hydroxide* solution; a red precipitate is formed.

(iii) To 1 ml of the extract, add 1 ml of *sodium hydroxide* solution and a pinch of *sulphanillic acid* and *sodium nitrite* with 1 ml of *water* and 1 ml of *hydrochloric acid*; a red precipitate is formed.

Distribution : North America and Gulf of Mexico.

History and authority : Proved by Dubs, *Trans. American Inst. Hom.* I, 200, 1845; Allen: *Encyclop. Mat. Med.* Vol. V, 609.

Preparation : (a) Mother Tincture ϕ

	Drug strength 1/10
Lobelia Cardinalis in *coarse powder*	100 g
Purified Water	400 g
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LOLIUM TEMULENTUM
(Lol. tem.)

Botanical name : *Lolium temulentum* Linn. **Family**: Gramineae (Poaceae)

Synonyms : *Lolium arvense* With., *L. robustum* Reich.

Common names : *Hindi*: Mochini; *English*: Bearded Darnel; *French*: Ivraie; *German*: Taumlloch.

Description : Culms single or a few together, 40 to 80 cm tall scabrulous; leaf blades glabrous beneath, scabrous above, 3 to 8 mm wide; spike 1 to 2 cm long, with scabrous margins; spikelets 5 to 8 flowered; glume firm, straight, strongly 5 to 7 nerved, equaling or surpassing the upper most lemma, 12 to 22 mm long, lemma obtuse, awned or awnless. Grains elliptic, oblong, semi-terete, grooved.

Part used : Seed.

Distribution : Native of temperate Asia, Southern Europe and Northern Africa. Cultivated in Punjab and Kashmir; occurs as weed in fields.

History and authority : Introduced and proved by Wierius, Seeger and Burghard et el; Allen: *Encyclop. Mat. Med.*, Vol. V, 622; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 317.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Lolium Temulentum in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	537 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

LYCOPERSICUM ESCULENTUM
(Lyco. es.)

Botanical name : *Lycopersicum esculentum* Mill. **Family**: Solanceae

Synonym : *Solanum lycopersicum* Linn.

Common names : *Hindi*: Tamatar; *English*: Tomato; *French*: Pomme d' amour; *German*: Liebsapfel.

Description : Decumbent to semierect and erect. Decumbent forms have few short branches which attain a length up to 0.75 m and about 2.5 cm diameter at the base. Large erect types, up to 2 m in length, the main stem very thick branching usually sympodial but monopodial at the base of the plant. Leaves usually alternate, pinnate, the number of larger leaflets ranging from 7 to 9 rarely 11 and between adjacent pairs of these, a variable number of smaller ones occur, the margins of the leaflets variously incised; petioles 3.0 cm in length. Inflorescence usually two ranked raceme of branched racemose-cyme, with 4 to 12 or more flowers. Flowers pendent, perfect hypogynous and regular, cultivated varieties with 5 to 10 corolla lobes, corolla rotate, tubular with 5 or more greenish-yellow lobes; stamens 5, filaments short, anthers united laterally to form a hollow cone, around the pistil; pistil bicarpellary to polycarpellary, style elongated and stigma smooth. Fruit red berry, globose, pyriform or depressed lobes.

Part used : Whole plant.

Microscopical : Stem: epidermal cells with capitate glandular and large pointed non-glandular hairs; a zone of chlorenchymatous cortex followed by a band of well developed collenchyma. Stele amphiphloic siphonostele in which bicollaterel bundles are at first separated by broad medullary rays; later form a continuous xylem cylinder. Inner phloem in the form of scattered strands separated from each other and from xylem by parenchyma. Outer phloem also a discontinuous ring at first becoming continuous as a result of development of secondary phloem. Secondary xylem vessels and wood parenchyma, interfascicular cambium present. Inner pericyclic fibre groups are less numerous than the outer ones. Endodermis sometimes with casparian strips on the walls.

Leaf: walls of single layered upper epidermis, much less sinuous than those of lower epidermis, stomata anomocyctic, single row of palisade cells and a very loosely organised spongy region of 4 to 5 layers. Bundles bicollateral like the stem.

Petiole: epidermis pubescent, underlying chlorenchymatous cortex 3 or 4 cell in thickness followed by an uninterrupted band of collenchyma which is 3 to 6 cell thick within this is the parenchymatous zone surrounding a circle of vascular strands but

open towards the adaxial surface. In older petioles, some of the bundles may be interconnected by an interfascicular cambium. Bundles bicollateral like the stem.

Root: cortex 3 or 4 layers thick. Endodermis with prominent casparian strips. Primary root diarch, pericycle uniseriate, secondary roots, commonly tetrarch, occasional pentarch.

Distribution : Cultivated throughout India.

History and authority : Proved by Gross; Allen: *Encyclop. Mat. Med*. Vol. V, 627; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 325.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Lycopersicum Esculentum, moist magma containing solids 100 g and plant moisture 500 ml	600 g
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol;* 3x and higher with *Dispensing Alcohol*.

MANCINELLA
(Mancin.)

Botanical name : *Hippomane mancinella* Linn. **Family**: Euphorbiaceae

Common names : *English*: Manchineel; *French*: Mancenillier Veneneux; *German*: Manschinapel.

Description : A tree, 6 to 15 m high, much branched with thick necked twigs. Leaves shiny green, stalked, with elliptical edges cut like saw-teeth, a single gland on upper side where the stalk and leaf join; very small inconspicuous, flowers on long slender spikes, females placed singly at base, males in little clusters, on the upper part with a two parted calyx and two or four stamens joined by their filaments; females with a many celled ovary, crowned with 4 to 8 styles and reflex stigmas. Fruit a berry, rounded, fleshy, yellow green.

Part used : Leaf, bark and fruit.

Microscopical : Leaf: dorsiventral, epidermis single layered with elongated rectangular cells covered with thick cuticle; mesophyll with palisade 2 to 3 layered and spongy parenchyma 10 to 14 layered; small veins with collateral bundles unsheathed by a single layered scelerenchymatous bundle sheath with adaxial and abaxial extensions, sometimes with transparent stands. Midrib with a few-celled collenchyma below upper and lower epidermis, followed by lignified thick-walled oval isodiametric parenchyma cells containing large brown dots at places; stele consisting of a large arc-shaped dorso-convex collateral bundle, capped above the phloem by a patch of sclerenchyma fibres and 4 to 5 medullary bundles above the grap between the ends of the abaxial arc; madullary bundles collateral with patches of sclerenchyma above the ventral phloem.

Powder: stomata paracytic, on lower epidermis only; stomatal index for lower epidermis 75.8 to 77.7; palisade ratio 6.2 to 6.4; laticiferous ducts branched; septate; upper epidermis bearing widely spaced round crystal bearing cells, 20 to 28 µ by 12 to 28 µ.

Petiole: circular in outline with single layered epidermis of dumbbell-shaped cells covered by thick cuticle; collenchyma 4 to 5 layered. Ground tissue wide, containing oval, isodiametric thick-walled parenchyma cells and four collateral widely spaced vascular bundles arranged in a ring, each capped by a patch of sclerenchyma fibres; numerous brown dots and cluster crystals in parenchyma cells. Center wide, oval, isodiametric thick-walled cells, numerous brown dots and cluster crystals present in parenchyma.

Bark: Cork 6 to 10 layered; cork-cambium 4 to 5 layered; secondary cortex 15 to 24 layered containing oval thick-walled parenchyma cells, with numerous brown oval dots, aggregate of crystals;

secondary phloem wide, containing uniseriate, thick-walled rays, abundant bast and a little parenchyma. Powder containing branched, septate laticiferous duct.

Distribution : Coast of Central America, W. Indies and adjoining South America and South Florida.

History and authority : Introduced and proved by Bute; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 396.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Mancinella in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, two parts of Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

MANGANUM MURIATICUM
(Mng. Mur.)

Chemical formula : $MnCl_2. 4H_2O$ **Mol. wt.**: 197.91

Common names : *English*: Manganous chloride, Manganese chloride.

Description : Tetrahydrate, pale rose-coloured masses, of a crystalline texture, monoclinic crystals and deliquescent; odourless. Freely soluble in *water* and *alcohol*; insoluble in *ether*. Decomposed by heat in a moist atmosphere giving off hydrochloric acid and leaving a residue of *manganous-manganic oxide.* It is prepared with dry chlorine gas and manganous carbonate.

Identification : (i) Yields reactions characteristics of *manganese* and *chloride.*

(ii) Add little *sodium periodate* and *acidic potassium permanganate solution*, warm; it decolorises.

Water insoluble matter: Dissolve 10 g in 100 ml of *water* and heat on water bath for 30 minutes, filter the undissolved matter, wash and dry at 105°. The residue is not more than 1.0 mg.

Iron : Dissolve 1 g in 10 ml of *water*, add 2 ml of *hydrochloric acid* and dilute to 50 ml. Add about 30 mg of *ammonium per sulphate* and 3 ml of *ammonium thiocyanate*; red colour produced not darker than that a blank to which 0.01 mg of *iron* has been added.

Assay : Take about 2 g, accurately weighed and dissolved in 50 ml *water*, add 100 ml of 0.1 N *silver nitrate*. Titrate excess of *silver nitrate* with 0.1 N a*mmonium thiocynate* using *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *silver nitrate* is equivalent to 0.009895 g of $MnCl_2$ $4H_2O$.

History and authority : Proved by Lemleke *N.Z.F.H.Kl.,* (2) 28; Allen: *Encyclop. Mat. Med.,* Vol. VI, 165; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 406.

Preparation : (a) Mother Tincture ϕ Drug Strength1/10

Manganum Muriaticum 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

MANGANUM OXYDATUM NIGRUM

(Mang. oxy.)

Chemical formula : MnO_2 **Mol. wt.**: 86.94

Common names : *English*: Manganese dioxide; *German*: Braunstein Mangansuperoxyd.

Description : Iron-black of steel-grey, opaque, lustrous crystalline or amorphous masses or rhombic crystals. Soluble in *hydrochloric acid*. Insoluble in *water*. Contains not less than 70.0 percent MnO_2, calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) To 10 ml of 5 percent solution in *dilute nitric acid* add 1 ml of *sodium sulphide solution*; a pink precipitate soluble in *acetic acid* is produced.

(ii) To 0.1 g add 2 g of *lead dioxide* and 5 ml of *picric acid*, boil gently for a few minutes, dilute with about 100 ml of *water* and filter; the filtrate is magenta-coloured.

Assay : Take about 0.2 g accurately weighed in a stoppered flask, add 50 ml of *water*, 3 g of *potassium iodide* and 10 ml of *dilute hydrochloric acid* and shake until solution is complete; titrate the liberated *iodine* with 0.1 N *sodium thiosulphate* using *starch* as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.004347 g of MnO_2.

History and authority : Introduced and proved by Lembke, *Zeit. F. Hom. KI.* 3 (1854); Allen: *Encyclop. Mat. Med.*, Vol. VI, 166; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 407.

Preparation : (a) Trituration 1x

	Drug strength1/10
Manganum Oxydatum Nigrum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

MERCURIUS ET KALI IODATUS
(Merc. ki.)

Chemical formula : HgI_2 2KI **Mol. wt.**: 786.48

Common name : *English*: Potassium mercuric iodide.

Description : Yellow crystals of long prisms, deliquescent in air, odourless, taste strong metallic; soluble in *alcohol* and very soluble in *water* but decomposes. Contains not less than 98.0 percent and not more than equivalent of 102.0 percent of $HgI_2$2KI with reference to the substance dried to constant weight at 105°.

Assay : Dissolve about 12 g, accurately weighed, in *water*, dilute the solution to a volume which should contain equivalent of about 0.4 g of *mercuric iodide*, add an equal volume of *glacial acetic acid* and 2 g of *zinc fillings* and boil the mixture for 30 minutes under reflux condenser. Cool, pour off the liquid and wash the amalgam with *water;* dissolve the *mercury*. Add *potassium permanganate solution* until a permanent pink colour is produced; decolourise the solution by adding a little quantity of f*errous sulphate*, titrate with 0.1 N *ammonium thiocyanate*, using *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *ammonium thiocyanate* equivalent to 0.07864 g of $HgI_2$2KI.

History and authority : Introduced by Hale; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. II, 459.

Preparation : (a) Trituration 1x — Drug strength 1/10

Mercurius Et Kali Iodatus	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

MERCURIUS NITRICUS
(Merc. nit.)

Chemical formula : $Hg(NO_3)_2$ **Mol. wt.**: 324.66

Common names : *English*: Mercuric nitrate; *German*: Queck selver oxydul nitrat.

Description : White or slightly yellow, deliquescent crystalline powder; odour of *nitric acid*. Solube in *water* but decomposes in excess of *water.* Contains not less than 99.0 percent of $Hg(NO_3)_2$ with reference to the substance dried to constant weight over siliga gel.

Identification : (i) Solution of *sodium hydroxide* yields a yellow precipitate with its solution in *water*.

(ii) Solution of *potassium iodide* added to a neutral solution, produces a scarlet precipitate soluble in excess of precipitant and in a considerable excess of the solution of the *mercuric salt.*

(iii) It liberates red brown fumes when warmed with *sulphuric acid* and *copper*.

(iv) An aqueous solution when cautiously mixed with *sulphuric acid* and a crystal of *brucine* is added; a red colour is produced.

Non-volatile matter : Moisten 2 g with *sulphuric acid* and ignite; not more than 1 mg of residue obtained.

Assay : Dissolve about 0.5 g accurately weighed in 100 ml of *water* containing 5 ml of *nitric acid*. Titrate with 0.1 N *ammonium thiocyanate* using 5 ml of *ferric ammonium sulphate* as indicator. Each ml of 0.1 N *ammonium thiocyanate* is equivalent to 0.01623 g of $Hg(NO_3)_2$.

History and authority : Introduced by Hanson; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 469.

Preparation : (a) Trituration 2x — Drug strength 1/10

Mercurius Nitricus	10 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NARCOTINUM
(Narcot.)

Chemical formula : $C_{22}H_{23}NO_7$ **Mol. wt.**: 413.42

Common names : *English*: Narcotine; *German*: Dejrosnesches Salz.

Description : An alkaloid obtained from opium. It occurs as a fine, almost white odourless, tasteless crystalline powder. Insoluble in *water;* slightly soluble in *alcohol* and *ether;* soluble in *acetone* and *benzene;* very soluble in *chloroform*. Contains not less than 98.5 percent of $C_{22}H_{23}NO_7$ calculated with reference to the substance dried to constant weight at 105°.

Identification : A 1 cm layer of a 0.001 percent w/v solution in *methyl alcohol* containing 0.4 percent w/v of *potassium hydroxide* exhibits light absorption with a maximum at 307 µ. The ratio of the extinction at 307 µ to that at 261 µ about 3.13.

Melting Point : 174° to 176°.

Morphine : Dissolve 0.10 g in 10 ml of N/10 *hydrochloric acid*. To 1 ml of this solution, add a mixture of 1 ml *potassium ferricyanide solution*, 0.05 ml *ferric chloride* solution and 4 ml *water;* no blue or dark green colour develops within one minute.

Loss on Drying : When dried to constant weight at 105°, loses not more than 1.0 percent of its weight.

Sulphated ash : Not more than 0.1 percent.

Assay : Take about 0.5 g accurately weighed carrying out non-aqueous titration. Each ml of 0.1 N *perchloric acid* is equivalent to 0.04134 g of $C_{22}H_{23}NO_7$.

History and authority : Proved by Tully, *Bost. Med. and Surg. Journ.*, 1832, Vol. VII, 28; Allen: *Encyclop. Mat. Med.* Vol. VI, 468.

Preparation : (a) Trituration 1x — Drug strength 1/10

Narcotinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x to be kept in well-closed containers.

NATRUM BROMATUM

(Nat. brom.)

Chemical formula : NaBr **Mol. wt.**: 102.91

Common names : *English*: Sodium bromide; *French*: Bromure de soude; *German*: Bromatrium.

Description : Small colourless transparent or opaque, cubical crystals or a white granular powder; odourless; taste intensely saline and slightly bitter. Absorbs moisture from air. Freely soluble in *water* and soluble in *alcohol*.

Identification : Yields reactions characteristics of *sodium* and of *bromides*, H.P.I., Vol. I,

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Barium : Dissolve 0.5 g in 10 ml of *water* and add 1 ml of *dilute sulphuric acid*; no turbidity is produced within 5 minutes.

Iron : 0.5 g complies with the *limit test for iron*, H.P.I., Vol. I,

Heavy metals : Dissolve 2 g in 10 ml *water*, add 2 ml *dilute acetic acid* and *water* to make 25 ml; the *limit of heavy metals* is 10 parts per million.

Bromate : Powder 1 g and add 1 ml *dilute sulphuric acid*; no yellow colour is produced immediately.

Chloride : Dissolve 1 g in 75 ml *water* and 25 ml of *nitric acid* in a 500 ml distillation flask fitted with a bung carrying a thermometer and a tapered air inlet tube adjusted so that it is above the surface of the liquid. Pass a gentle stream of air, heat to 105°, lower the inlet tube into the liquid and continue to heat for 1 minute, maintaining the temperature at 105°. Remove the source of heat and pass a brisk stream of air for 10 minutes. Add 5 ml of 0.1 N *silver nitrate* and 5 drops of *nitro-benzene* and shake. Titrate the excess of *silver nitrate* with 0.1 N *ammonium thiocyanate*, using solution of *ferric ammonium sulphate* as indicator and shaking vigorously near the end point; not less than 3.7 ml of 0.1 N *ammonium thiocyanate* is required.

Sulphate : 2 g, complies with the *limit test for sulphates*, H.P.I., Vol. I,

Alkali : Dissolve 5 g in 50 ml of freshly boiled and cooled *water* and add 0.2 ml 0.1 N *sulphuric acid*; no colour is produced on the addition of a drop of solution of *phenolphthalein.*

Loss on drying : Loses not more than 5 percent of its weight when dried to constant weight at 105°.

Assay : Weigh accurately about 0.4 g and dissolve in 40 ml of *water* and 5 ml of *nitric acid.* Add 50 ml of 0.1 N *silver nitrate* and 5 ml of *nitrobenzene* and shake. Titrate with 0.1 N *ammonium thiocyanate* using *ferric ammonium sulphate* as indicator and shaking vigorously as the end point is approached. Correct for the amount of *chloride* present, as determined by the test for *chloride*. Each ml of 0.1 N *silver nitrate* is equivalent to 0.0119 g of NaBr.

History and authority : Introduced by Laborde, Archif de physiol, 1869 *A.H.Z.*, 87, 46; Allen: *Encyclop. Mat. Med.,* Vol. VI, 498.

Preparation : (a) Trituration 1x — Drug strength1/10

Natrum Bromatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NATRUM CHLORATUM
(Nat. chl.)

Chemical formula : $NaClO_3$ **Mol. wt.**: 106.45

Common name : *English:* Sodium chlorate.

Description : Colourless; odourless crystals or white granules, liberates oxygen on heating and decomposes entirely at higher temperature; very soluble in *water*; slightly soluble in *alcohol*. *Sodium chloride* diminishes its solubility in *water*. The aqueous solution is neutral. Contains not less than 99.0 percent of $NaClO_3$ calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) Yields the reactions characteristic for *sodium*, H.P.I., Vol. I,

(ii) To 100 mg add 5 ml *water* and 2 ml of 5 percent solution of *silver nitrate*; no precipitate appears. Now add 100 mg *zinc dust* and 1 ml dilute *sulphuric acid* and warm; a white precipitate appears.

Arsenic : Not more than 20 parts per million.

Chloride : Not more than 100 parts per million.

Sulphate : Not more than 100 parts per million.

Heavy metals : Not more than 50 parts per million.

Assay : Weigh accurately about 0.5 g and dissolve it in 20 ml of *water*, add 1 g *zinc dust* and 20 ml *dilute sulphuric acid* and warm for 15 minutes and filter. To the filtrate add 20 ml of 5 percent *silver nitrate solution* and shake well and filter through sintered glass crucible; dry in hot air and weigh to constant weight. Each gram of residue is equivalent to 0.7290 g of $NaClO_3$.

History and authority : Boericke: *Materia Medica and Repertory*, 9th Ed., 458.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Chloratum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Keep out of contact with organic matter and other oxidisable substance.

NATRUM IODATUM
(Nat. iod.)

Chemical formula : NaI **Mol. wt.**: 149.90

Common names : *English*: Sodium iodide; *French*: Iodure de soude; *German*: Natrum Jdiode.

Description : Colourless crystals or white crystalline powder. Deliquescent in moist air, slowly turns brown in air due to liberation of *iodine*; odourless; taste saline and slightly bitter. Very soluble in *water* and freely soluble in *alcohol*. Contains not less than 99.0 percent of NaI, calculated with reference to the substance dried to constant weight at 105°.

Identification : Yields reactions characteristic of *sodium*, H.P.I., Vol. I, and *iodide*, H.P.I., Vol. II,

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,
Sulphate : 1.0 g complies with the *limit test for sulphate*, H.P.I., Vol. I,

Lead : Not more than 10 parts per million, H.P.I., Vol. I,

Loss on drying : When dried to constant weight at 105° loses not more than 5.0 percent of its weight.

Iodate : Dissolve 0.5 g in 10 ml of *water* freshly boiled and cooled, add 2 drops of *dilute sulphuric acid* followed by a drop of *starch mucilage*; no blue colour is produced immediately.

Assay : Dissolve about 0.5 accurately weighed with 50 ml *water* and 60 ml *hydrochloric acid* and titrate with 0.05 N *potassium iodate* until the brown solution which is formed becomes pale brown. Add 1 ml of *amarnanth solution* and continue the titration until the red colour changes to pale yellow. Each ml of 0.05 N *potassium iodate* is equivalent to 0.01499 g of NaI.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 548; Boericke: *Mat. Med. and Repertory*, 468.

Preparation : (a) Trituration 1x — Drug strength1/10

Natrum Iodatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NATRUM SILICATUM

(Nat. sil.)

Chemical formula : $Na_2SiO_3.H_2O$ **Mol. wt.**: 353.4

Common names : *English*: Sodium silicate; *French*: Silicate desoude; *German*: Natriumsilikat.

Description : A white or colourless or greyish-white crystal like pieces or lumps. Slightly soluble in cold *water* and soluble in hot *water*. Contains not less than 50.0 percent of *sodium silicate*.

Identification : (i) Yields the reactions characteristic of *sodium* and *silicate.*

(ii) To a solution in *water* and *hydrochloric acid*; a gelatinous precipitate is produced.

Loss on ignition : When gently ignited to constant weight loses not less than 35 percent and not more than 50 percent of its weight.

Assay : Weigh accurately about 0.4 g of finely powdered material into a platinum dish; add 10 to 15 ml of *water*. Cover the dish with a clock glass and place on the water bath and add gradually 25 ml of 50 percent *hydrochloric acid*. Stir with glass-rod till the powder is completely decomposed. Evaporate to dryness and place the dish in an oven at 110° for 1 hour to dehydrate the silica. Moisten the residue with 5 ml concentrate *hydrochloric acid*; add 75 ml *water* and heat on steam bath for 10 to 20 minutes. Filter and wash the precipitate with 5 percent dilute *hydrochloric acid,* followed by hot *water*. Place the filter paper in silica crucible, dry and burn off over a low flame and heat for an hour to complete dehydration. Cool in a dessicator and weigh. Each g of residue will be equivalent to 3.534 g of $Na_2SiO_3.H_2O$.

History and authority : Introduced by Kent: *New Remedies* (Indian Ed. 1963), 120; Boericke: *Mat. Med. and Repertory,* 9th Edition, 462.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Silicatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b)Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NATRUM SULPHUROSUM
(Nat. sulph.)

Chemical formula : $Na_2SO_3.7H_2O$ **Mol. wt.**: 252.18

Common names : *English*: Sodium sulphite; *French*: Sulfite de soude; *German*: Schwefel saures Natron.

Description : Heptahydrate, efflorescent, colourless, opaque crystals nearly odourless and having a cooling, saline, bitter taste, soluble in *water* and slightly soluble in *alcohol.* It is prepared by passing a current of *sulphurdioxide* into a solution of *sodium carbonate.* Contains not less than 96.0 percent of $Na_2SO_3.7H_2O$**.**

Identification : Yields the reactions characteristic of *sodium* and *sulphite*.

Water insoluble matters : Dissolve 20 g in 200 ml of *water* and heat on steam bath for one hour. Filter any undissolved matter. Wash it with *water* and dry at 105°. The weight of the insoluble residue does not exceed 1.0 mg.

Free acid : Dissolve 1 g in 10 ml of *water* and add 2 drops of *a solution of phenolphthalein*; a pink colour is produced.

Thiosulphate : Dissolve 1 g in 15 ml of *water* and slowly add 5 ml of *hydrochloric acid*; no turbidity is produced in 5 minutes.

Assay : Weigh accurately about 0.25 g and add 50 ml of 0.1 N *iodine*. Allow to stand for 5 minutes, add 1 ml of *hydrochloric acid* and titrate the excess of *iodine* with 0.1 N *sodium thiosulphate*, using *starch* as indicator. Each ml of 0.1 N *iodine* is equivalent to 0.01261 g of $Na_2SO_3.7H_2O$.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 579.

Preparation : (a) Trituration 1x — Drug strength 1/10

Natrum Sulphurosum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NICCOLUM CARBONICUM

(Nic. carb.)

Chemical formula : $NiCO_3.\ 2Ni(OH)_2.\ 4H_2O$ **Mol. Wt.**: 342.13

Common names : *English*: Hydrated carbonate of nickel; *French*: Hydrated Nickel carbonate; *German*: Nickelkarbonat.

Description : The hydrated nickel carbonate which is more stable than anhydrous *nickle carbonate*. A greenish-white powder; soluble in *ammonium carbonate*, insoluble in *water*. Contains not less than 45 percent *nickle* with reference to substance dried to constant weight at 105°.

Identification : (i) To 1 g add a few drops of *hydrochloric acid* effervescence produced; pass the gas through aqueous solution of *calcium hydroxide;* a white precipitate is produced.

(ii) Dissolve 100 mg in a little quantity of *hydrochloric acid*, place 2 to 3 drops of the solution on a white tile and add one drop of 1 percent ethanolic solution of *dimethyl glycerine*, add 2 to 3 drops of *ammonia solution*; a red coloured precipitate is produced.

Assay : Weigh accurately about 0.2 g in a 500 ml beaker provided with a clock glass cover and stirring rod. Dissolve in 15 ml of *dilute hydrochloric acid* and dilute to 200 ml with *water*. Heat at 70° to 80°, add 60 ml *dimethyl-glycerine* (1 percent solution in *alcohol*) and immediately add *dilute ammonia solution* drop wise directly to the solution, with constant stirring until precipitation takes place and then add a slight excess. Allow to stand on the water bath for 20 to 30 minutes and test the solution for complete precipitation when the red precipitate has settled down. Allow to stand for 1 hour in ice cold *water*. Filter and cold solution through a tared Gooch sintered glass crucible of G-4 porosity and weigh it after cooling in a desiccator, wash the precipitate with cold *water* until free from chloride and dry it at 110° to 120° for 45 to 50 minutes.

Allow to cool in a desiccator and weigh. Repeat the drying until constant weight is attained. Each g of precipitate Ni $(C_4H_7O_2N_2)_2$ is equivalent to 0.2032 g of hydrated nickel carbonate.

History and authority : Proved by Nenning, Hartlaub and Trinks, *Annalen.* 3, 353; Allen: *Encyclop. Mat. Med.*, Vol. VI, 633.

Preparations : (a) Trituration 1x — Drug strength 1/10

Niccolum Carbonicum	222 g
Saccharum Lactis	778 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Note: Instead of 100 g pure *nickel carbonate* 300 g of hydrated *nickel carbonate* should be taken to equivalent 100 g of *nickel carbonate* the main drug used in Homoeopathy.

NICCOLUM METALLICUM
(Nic. met.)

Chemical formula : Ni **At. wt.**: 58.70

Common names : *English*: Niccolum, Nickel; *German:* Funfcentstuck.

Description : A lustrous, white, malleable, ferromagnetic metal, stable in air at ordinary temperature; burns in oxygen, turning nickel oxide; slowly attacked by *dilute hydrochloric* and by *sulphuric acid*, readily attacked by *nitric acid.* Contains not less than 99.5 percent Ni.

Identification : Dissolve in *dilute hydrochloric acid*, add a little *ammonium chloride* and *ammonium hydroxide solution* and pass *hydrogen sulphide gas*; black precipitate is produced.

Lead : Not more than 30 parts per million.

Cobalt : Not more than 500 parts per million.

Assay : Dissolve about 0.5 g accurately weighed in minimum quantity of concentrate *hydrochloric acid*, dilute with *water* and add 15 ml of 5 percent *dimethyl glycerine* (*alcoholic*), stir well, add strong *ammonia solution* drop by drop till complete precipitation takes place. Heat on water bath for 30 minutes, filter through Gooch crucible No. 4, dry the precipitate to constant weight and weigh the precipitate; each g of precipitate is equivalent to 0.2032 of Ni.

History and authority : Proved by Nenning, Hartlaub and Trinks, *Annalen,* 3, 353; Allen: *Encyclop. Mat. Med.*, Vol. VI, 633; Hering: *Guiding Symptoms*, Vol. VIII, 35.

Preparation : (a) Trituration 1x — Drug strength1/10

Niccolum Metallicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

NYMPHAEA ODORATA

(Nym. odo.)

Botanical name : *Nymphaea odorata* Soland **Family**: Nymphaeaceae

Common names : *English*: Sweet water-lily; *German*: Seerose.

Description : Perennial, aquatic herb with a thick horizontal root stock. Stem absent. Leaves floating, orbicular, smooth, shining, entire and dark-green above, wine coloured beneath; stipules broadly triangular, knotted at the apex and appressed to the root stock. Flowers large, solitary, axillary white, fragrant, often 15 cm in diameter; sepals 4, elliptical, nearly free; petals numerous stamens indefinite; ovary large globular depressed 18 to 24 celled. Fruit depressed globular flesh; seeds oblong.

Part used : Root.

Identification : Take 10 g, extract with 100 ml of 50 percent *alcohol*. To 5 ml of the extract add 1 ml *acetic acid*, 2 percent w/v *ferrous sulphate solution* and a few drops of *hydrogen peroxide solution*; a dirty purple colour is produced.

Distribution : Eastern and Southern parts of U.S.A.

History and authority : Proved by Cowles, *Hale: New Remedies 2nd Ed.*; Allen: *Encyclop. Mat. Med.,* Vol. VII, 127; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. II, 632.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Nymphaea Odorata in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	468 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain on part Mother Tincture, four parts Purified Water; five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

OENANTHE CROCATA

(Oen. croc.)

Botanical name : *Oenanthe crocata* Linn. **Family**: Umbelliferae (Apiaceae)

Synonym : *Oenanthe abiifolia* Brot.

Common names : *English*: Water dropwort, water hemlock; *French*: Oenanthe safranee; *German*: Safrandolde.

Description : A stout, erect, branched, glabrous, perennial, 50 to 150 cm, root tubers 2 to 3 cm diameter. Stem fusiform hollow, grooved. Leaves 30 cm or more deltoid, 3 to 4 pinnate, segments ovate or sub-orbicular, cuneate at base, 1 to 2 lobed, serrate, teeth obtuse or sub-acute with a minute apiculus, segments of stem leaves narrower; petioles entitely sheathing. Flowers 2 mm diameter with outer petals unequal, in umbels 5 to 10 cm diameter. Bracts and bracteoles many, caducous linear-lanceolate. Fruit 4 to 6 mm, cylindrical; style 2 mm erect. Root taste, sweet but poisonous and contains yellow juice when fresh.

Part used : Root.

Identification : Carry out TLC of an alcoholic extract using *benzene* : *methanol* (9:1) as mobile phase; four spots are observed at R_f 0.12, 0.28, 0.33 (all brownish) and 0.42 (violet), after spraying with *antimony trichloride solution* and on heating at 105° for 15 minutes.

Distribution : Great Britain and British Islands, Ireland, Spain, France, Belgium and Portugal.

History and authority : Introduced by Ray, *Phillos Trans.* 1699, Archiv XIV, 2, 188 in (1834); Allen: *Encyclop. Mat. Med*., Vol. VII, 128; Hering: *Guiding Symptoms*, Vol. VIII, 182.

(a) Mother Tincture ϕ — Drug strength 1/10

Oenanthe Crocata in *coarse powder*	100 g
Purified Water	600 m
Strong Alcohol	435 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*, 3x and higher with *Dispensing Alcohol.*

PALLADIUM

(Pallad.)

Chemical formula : Pd **At. wt.**: 106.40

Description : It is a silvery white metal in fine powder; it is black. It readily absorbs *hydrogen*; soluble in hot concentrated *sulphuric acid*, rapidly in presence of *ammonium sulphate.* Contains not less than 99.5 percent Pd with reference to the substance dried to constant weight at 105°.

Identification : (i) When exposed to iodine vapour; blackens owing to the formation of the insoluble *di-iodide*.

(ii) One drop of a saturated *mercuric cyanide solution* followed by a drop of the test solution and further drop of *mercuric cyanide solution* are placed on a filter paper. Palladium precipitates as palladous cyanide in the middle of the 'fleck'. *Stannous chloride* is put on the middle of the 'fleck'; an orange or golden yellow colour is produced.

Iron : Not more than 10 parts per million, H.P.I., Vol. I,

Lead : Not more than 10 parts per million, H.P.I., Vol. I,

Assay : Weigh accurately about 0.3 g, dissolve in hot *concentrated sulphuric acid* in the presence of small quantity of *ammonium sulphate*, neutralise free acid by adding 1 N *sodium hydroxide solution* using *bromocresol green* as indicator. Add 5 ml of 0.1 N *hydrochlorc acid*, 0.2 g *potassium nickel cyanide*; dilute to 100 ml with *water*. Add 5 ml of *ammonia ammonium chloride* buffer solution of pH 10, 25 ml of 0.01 *M EDTA solution*, 0.1 g of *ascorbic acid* and few drops of *eriochrome black-T* as indicator. Titrate the excess of EDTA with 0.01 M *magnessium sulphate solution* until the colour of the solution turns to red; perform blank. Each ml of 0.01 M *magnesium sulphate* is equivalent to 0.001064 g of Pd.

History and authority : Introduced and proved by Hering: *Guiding Symptoms*, Vol. VIII, 247; Clarke: *A Dictionary of Practical Mat. Med*., Vol. II, 711.

Preparation : (a) Trituration 1x Drug strength1/10

Palladium in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

PASTINACA
(Pastin.)

Botanical name : *Pastinaca sativa* Linn. **Family**: Umbelliferae (Apiaceae)

Synonym : *Peucedanum sativum* S. Wats.

Common name : *English*: Parsnip.

Description : Biennial robust herb, up to 1.5 m high. Stem grooved and smooth. Leaves pinnately compound, leaflets 5 to 10 cm long, oblong to ovate, obtuse serrate or lobed or sometimes completely divided into 2 to 5 segments; petiole sheathed. Flowers yellow in flat terminal umbel; fruits broadly elliptic or obovate 5 to 7 mm long. Roots fusiform, fleshy, long succulent, white or cream coloured; sweet and aromatic.

Part used : Root.

Microscopical : Consists of cortex of large amyliferous phloem parenchyma, xylem often diarch sometimes triarch. Oil ducts in the pericycle and primary phloem are relatively ephemeral.

Identification : Take 10 g, extract with 100 ml of 70 percent *alcohol*. Evaporate 25 ml of the extract on water-bath and extract the residue with *chloroform* twice. Concentrate the combined *chloroform* extract and carry out the TLC over silica gel 'G' using *benzene* : *acetone* (9 : 1 v/v) as mobile phase. Under UV light five spots appear at R_f 0.75, 0.66, 0.46, 0.39 and 0.31 (all blue fluorescence); on spraying it with solution of *antimony trichloride* in *chloroform*, four spots appear at R_f 0.28 (pink), 0.30 (blue), 0.49 (pinkish) and 0.58 (pink).

Distribution : Europe, Asia, North and South America, Australia and New Zealand.

History and authority : Proved by Unger, *Craz. Des. Hop. Sept.* 1846; Allen: *Encyclop. Mat. Med*., Vol. VII, 291.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pastinaca in *coarse powder*	100 g
Purified Water	233 ml
Strong Alcohol	787 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

PAULLINIA PINNATA

(Paul. p.)

Botanical name : *Paullinia pinnata* Linn. **Family**: Sapindaceae

Synonym : *Serjania curassavia* Radlk.

Common name : *English*: Winged-leaved paullinia.

Description : An evergreen climbing shrub, with peduncular or axillary tendrils; branching roots hairy at the base. Stem about 3 m long of flexible tenacious wood with slender, slightly pubescent, branches with deep parallel furrows. Leaves imparipinnate, not dotted, petiole winged at the base, leaflets 7 to 15 cm long, leaflets 2 jugal, glabrous, ovate-oblong or oblong-lanceolate, with distinct, coarse serratures. Flowers small, white, appear in axillary spikes which are accompanied by leaflets; sepals 5, distinct (or two of them combined); petals 4, bearing scales; stamens 8; capsule pyriform, wingless. Seeds crustaceous, arillute.

Part used : Root.

Identification : Evaporate 10 to 15 ml of the 75 percent ethanolic extract on water-bath to remove *alcohol*. Extract it with *chloroform*.

(1) Carryout TLC of *chloroform* extract on silica gel 'G' using *benzene* : *methanol* (95 : 5 v/v) as mobile phase. It gives five spots under UV light at R_f 0.09 0.23, 0.25, 0.33 and 0.74 and on spraying with *antimony trichloride* gives nine spots, having R_f values at 0.09, 0.19, 0.23, 0.30, 0.41, 0.55, 0.67, 0.83 and 0.86 (all brownish except the spots at R_f 0.67 and 0.83 are light in colour).

(2) Carryout TLC of aqueous extract on silica gel 'G' using *ethyl acetate* : *butanone : formic acid : water* (5 : 2 : 2 : 1 v/v) as mobile phase and on spraying with *aniline-phosphoric acid;* one yellowish-brown spot having R_f value 0.63 developed.

(3) The alcoholic solution reduces *ammonical silver nitrate.*

(4) To the alcoholic solution, add a few drops of *bromine water;* brown precipitate is formed.

Distribution : Latin America and West Indies.

History and authority : Introduced by Mure, *Pathogen,* Brazil; Allen: *Encyclop. Mat. Med.*, Vol. VII, 292.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Paullinia Pinnata in *coarse powder* 100 g

Purified Water	233 ml
Strong Alcohol	737 ml

to make one thousand millilitres of the Mother `Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

PHELLANDRIUM AQUATICUM
(Phel. aqu.)

Botanical name : *Oenanthe phellandrium* Lanks. **Family**: Umbelliferae (Apiaceae)

Synonym : *Phellandrium aquaticum* Linn.

Common names : *English*: Water Hamlock; *French*: Cigus aquatique; *German*: Wasserfenchel.

Description : A biennial herb. Root spindle shaped, thick, horizontal, crooked, oblique, resembling a turnip. Stem 60 to 90 cm high, very stout at the base, hollow, furrowed, very bushy, with numerous spreading leafy branches. Leaves shining; petiolate, spreading, tripinnate with innumerable fine acute segments. Flowers in umbel and all fertile, white upper ones largest.

Part used : Fruit.

Identification : Take a solution of 5 g of *sodium nitrite* in 8 ml of *water*, add 5 ml *petroleum ether* extract, add slowly 5 ml of *glacial acetic acid*, shake gently, a flocculent precipitate at the junction of two layers indicate the presence of Phellandrene.

Distribution : Northern Asia and Europe.

History and authority : Introduced by Hartlaub and Trinks, *R.A.-M.L.* II, 138; Proved by Nenning and Richter, *Arznm,* II, 211; Allen: *Encyclop. Mat. Med.*, Vol. VII, 335; Clarke: *A Dictionary of Practical Mat. Med.* Vol. III, 757.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Phellandrium Aquaticum in *coarse powder* 100 g

Strong Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

PICROTOXINUM
(Picro.)

Chemical formula : $C_{30}H_{34}O_{13}$ **Mol. wt.**: 602.27

Common name : *English*: Cocculin.

Description : Colourless, odourless, flexible, shining prismatic crystals; taste bitter. Slightly soluble in *water* and *alcohol*, sparingly soluble in solvent *ether* and *chloroform*; freely soluble in acids and alkalies.

Identification : (i) Dissolve in concentrated *sulphuric acid* forming a golden yellow solution, which turns reddish-brown on addition of trace of *potassium dichromate.*

(ii) Take a few crystals in an evaporating dish, add 0.2 g *potassium nitrate* followed by the addition of 3 or 4 drops of *sulphuric acid*, add an excess of *sodium hydroxide solution* dropwise; acquires a red colour which fades after sometime.

(iii) To 10 mg, add a few drops of *dilute potassium cupri-tartarate solution*; a red precipitate is produced.

Alkaloids : A saturated solution yields no precipitate with *tannic acid solution* or with *potassium mercuric-iodide solution*.

Melting range : 199° to 202°.

Reaction : A saturated solution is neutral to *litmus* solution.

Sulphated ash : Not more than 0.2 percent.

History and authority : Introduced and proved by Henry, *Amor*. *Obs*. XV, 1878, 16; Allen: *Encyclop. Mat. Med*., Vol. X, 617; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 820.

Preparation : (a) Trituration 1x — Drug strength 1/10

Picrotoxinum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method H.P.I., Vol. I, 6x to be converted to liquid 8x, H.P.I., Vol. I,

PILOCARPINUM MURIATICUM

(Pil. mur.)

Chemical formula : $C_{11}H_{16}N_2O_2HCl$ **Mol. wt.**: 244.70

Common names : *English*: Pilocarpine hydrochloride; *French*: Hydrochlorate-de-pilocarpine; *German*: Pilocarpin hydrochlorid.

Description : Colourless crystals or white crystlline powder, hygroscopic; odourless; taste slightly bitter. Very soluble in *water*, freely soluble in *alcohol*, slightly soluble in *chloroform*; insoluble in *ether*. Obtained from the leaves of *Pilocarpus microphyllu* Staph and other species of Pilocarpus of Family, Rutaceae.

Identification : (i) To a small quantity dissolved in *sulphuric acid* when *potassium dichromate* is added; a bright grass green colour is produced.

(ii) A mixture of equal parts with *calomel* becomes blackened when moistened with *alcohol*.

(iii) Dissolve 10 mg in 5 ml of *water*, add 0.1 ml of *dilute sulphuric acid*, 1 ml of *hydrogen peroxide solution*, shake well and allow to separate in to two layers. The benzene layer turns bluish-violet and the aqueous layer remains yellow. It gives the characteristic test of *chloride*.

Ash : Not more than 0.1 percent.

Melting range : 200° to 205°.

Reaction : A solution in *water* is acidic to *litmus*.

Test for absence of ether alkaloids : Dissolve 0.2 g in 20 ml water; to 10 ml add a few drops of *dilute ammonium hydroxide solution* and to the remainder, a few drops of *potassium dichromate solution*; no turbidity is produced in *either* solution.

History and authority : Introduced by Ringer and Jaunsen, *Pharm.* I., Ser. III, 5, 965; Allen: *Encyclop. Mat. Med*., Vol. VII, 535.

Preparation : (a) Trituration 1x Drug strength1/10

Pilocarpinum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x to be converted to liquid, 8x, H.P.I., Vol. I,

Caution : Poison! Not to be dispensed below 3x.

Storage : All preparations below 6x to be kept in well-closed containers protected from light.

PINUS SYLVESTRIS
(Pin. syl.)

Botanical name : *Pinus sylvestris* Linn. **Family**: Pinaceae

Common name : *English*: Scotch pine.

Description : Tree up to 40 m in height, with spreading often somewhat pendulous branches, pyramidal when young, with broad and round-topped, often picturesque head in old age; branchlets dull greyish-yellow; winter buds oblong, ovate, brown, resinous. Leaves needle like in two's rigid, acute, twisted, bluish-green 1.8 to 7.5 cm long. Female cones short-stalked, conic-oblong, greyish or reddish-brown, 3.8 to 6.5 cm long; apphyses (apex of scales) little thickened, slightly keeled, only those near the base elongated, umbo small obtuse; seed dark grey, 4 mm long.

Part used : Young shoot.

Microscopical : Young stem: shown single layered epidermis with irregular outline, thick cuticle covering epidermis; hypodermis of large, thick-walled and lignified cells; cortex of many layers of rounded cells with conspicuous schizogenous secretion reservoirs; vascular bundles collateral, open and arranged in a ring; xylem of trecheids but not vessels; phloem of sieve tubes, parenchyma, but no companion cells; medullary ray between the vascular bundles; pith of parenchymatous cells. After secondary growth is characterised by presence of resin ducts throughout the stem; secondary wood consists of tracheids with bordered pits on their radial walls, distinct annual rings consisting of autumn wood and spring wood, the former of narrow and thick tracheids and latter of wider and thinner-walled tracheids, xylem rays uniseriate and occasional ray may be wider and includes a resin duct, wood soft, straight grained and splits longitudinally leaving smooth surface.

Leaf: transaction shows a layer of thick-walled epidermal cells with a thick cuticle; sunken stomata opening internally into a respiratory cavity; 1 to 3 layers of hypodermis interrupted by the stomata. Mesophyll of thin-walled polygonal or irregular cells containing abundant chloroplasts and starch grains with peg like projections of the cell walls into the cell cavity; resin ducts in the mesophyll; endodermis of conspicuous layer of large barrel-shaped cells; pericycle of many layers consisting of parenchyma and transfusion tissue; transfusion tissue consists of albuminous cells which lie close to phloem and are parenchymatous in nature and rich in protein and starch; tracheidel cells adjoining xylem are thin-walled elongated cells but provided with bordered pits like tracheids. Two vascular bundles lie embedded within many layered pericycle are collateral and open, xylem rays of tracheids towards the angular side of leaf and phloem of sieve tubes towards convex side.

Distribution : Central and North Europe, North Asia, widely cultivated as forest tree in Europe.

History and authority : Proved and introduced in 1853 by Demeures, *Journde la Soc. Gall; lre ser*, Vol. IV, 114; Allen: *Encyclop. Mat. Med*., Vol. VII, 541; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 821.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pinus Sylvestris in *coarse powder*	100 g
Purified Water	150 ml
Strong Alcohol	870 ml

to make thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

PLATINUM MURIATICUM

(Plat. mur.)

Chemical formula : H_2PtCl_6. $6H_2O$ **Mol. wt.**: 517.80

Common names : *English*: Platinum hydrochloride; *French*: Perchlorure de platine; *German*: Platinchlorid.

Description : Brownish-yellow, hexahydrate crystals; odourless; taste, sharp and metallic; soluble in *water* and *alcohol*. It is prepared by dissolving *paltinum metal* in *aqua regia*. The solution then evaporated and *hydrochloric acid* is added gradually until it is entirely free from *nitric acid*.

Melting point : 60°.

Reaction and clarity of solution : 0.1 g dissolves completely in 1 ml of *water* and in 1 ml of *alcohol* to yield clear solutions; the solution in *water* is yellow. It should not be red or brown.

Nitrate : To 2 ml of a 10 percent w/v solution, add 2 ml of 10 percent w/v *ferrous sulphate solution* and add continuously but slowly 2 ml of *sulphuric acid* to form a lower layer; no brownish-red colour is formed at the zone of contact within few minutes.

Sulphates : Dilute 5 ml of a 10 percent w/v solution with 5 ml of *water* and add 1 ml of *barium chloride solution*; no turbidity or precipitate develops within 1 hour.

Assay : Dissolve about 0.5 g, accurately weighed in 20 ml *water* (if insoluble matter is present filter, wash thoroughly and concentrate the filtrate by evaporation and washings, to about 20 ml). Add 10 ml of a *saturated* solution of *ammonium chloride*, cover and allow to stand over-night. Filter, wash the precipitate with 20 ml of *saturated ammonium chloride solution*, dry, ignite carefully and weigh. The residue should not be less than 0.10 mg.

History and authority : Proved and introduced by Hofer, *Gaz. Med. de Paris,* 1840, *Archiv. F. Hom.,* 19, 44; Allen: *Encyclop. Mat. Med*., Vol. VII, 589; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 849.

Preparation : (a) Trituration 1x — Drug strength 1/10

Platinum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

(c) Mother Solution ϕ — Drug strength 1/10

Platinum Muriaticum	100 g
Purified Water in sufficient quantity	

to make one thousand millilitres of the Mother Solution.

(d) Potencies: 2x with *Dilute Alcohol*; 3x and higher with *Dispensing Alcohol.*

PLUMBUM ACETICUM
(Pl. acet.)

Chemical formula : $Pb(CH_3CO_2)_2.3H_2O$ **Mol. wt.**: 379.34

Common names : *English*: Lead accetate; *French*: Acetate de plomb; *German*: Essigsures Bleioxyd, Bleizucker.

Description : Small, white, transparent, monoclinic prisms or heavy, crystalline masses; odour acetous; taste, sweet and astringent. Eflorescent in warm air, becomes basic when heated. Freely soluble in *water* and *glycerol*, sparingly soluble in *alcohol*. Contains not less than 99.5 percent and not more than the equivalent of 104.5 percent of $C_4H_6O_4Pb.3H_2O$

Identification : Yields the reaction characteristics of *lead*, H.P.I., Vol. I, and of *acetates*, H.P.I., Vol. I,

Copper, iron, silver and zinc : Dissolve 0.5 g in 10 ml of *water*, add 2 ml of *dilute sulphuric acid*, allow to stand for half an hour and filter, to the filtrate add an excess of *potassium ferrocyanide solution*; no precipitate or colour is produced.

Chloride : 1.0 g complies with the *limit test for chloride*, H.P.I., Vol. I,

Water insoluble matter : 1.0 g dissolved in 10 ml of recently boiled and cooled *water*, yields a solution which is, at most, faintly opalescent and becomes clear on the addition of 1 drop of *acetic acid*.

Assay : Dissolve about 0.8 g, accurately weighed, in a mixture of 100 ml *water* and 2 ml *acetic acid*, add 5 g of *hexamine* and titrate with M/20 *sodium edetate*, using 0.2 ml of *xylenol orange* as indicator, until the solution becomes pale yellow. Each ml of M/20 *sodium edetate* is equivalent to 0.01897 g of $C_4H_6O_4Pb.3H_2O$.

History and authority : Introduced and proved by Hartlaub, Trinks and Nenning; Allen: *Encyclop. Mat. Med.*, Vol. VII, 1; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 855; Hering: *Guiding Symptoms*, Vol. VIII, 475.

Preparation : (a) Mother Solution ϕ Drug strength1/10

Plumbum Aceticum 100 g

Purified Water in sufficient quantity

to make one thousand millilitres of the Mother Solution.

(b) Potencies: 2x with *Dilute Alcohol*; 3x and higher with *Dispensing Alcohol*.

(c) Trituration 1x — Drug strength1/10

Plumbum Aceticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(d) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : All preparation below 3x to be freshly made.

PLUMBUM CHROMICUM

(Pb. ch.)

Chemical formula : $PbCrO_4$ **Mol. wt.**: 323.22

Common name : *English*: Lead chromate.

Description : Yellow or orange yellow powder. Insoluble in *water;* soluble in *hydrochloric acid*, *nitric acid* and *sodium hydroxide solution.* Contains not less than 99.0 percent of the substance dried to constant weight at 105°.

Identification : (i) Yields reactions characteristic of *lead*, H.P.I., Vol. I, and of *chromates*.

(ii) Dissolve 0.1 g in 1 ml of 50 percent *sulphuric acid*, add 1 ml of a 1.0 percent *alcoholic diphenyl carbazide solution;* a violet colour is produced.

Soluble substances : Boil 0.1 g with 20 ml of *water* and 1 ml of *glacial acetic acid* with shaking, cool and filter. Evaporate the filtrate to dryness on water bath. Dry the residue to constant weight at 105°. Residue is not more than 0.15 mg.

Assay : Dissolve 0.5 g in 50 ml of 10 percent *sodium hydroxide solution*. Add 2.5 g of *potassium iodide*, 100 ml of *hydrochloric acid*. Keep in dark for 5 minutes. Titrate the liberated *iodine* with 0.1 N *sodium thiosulphate*, using *starch* as an indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01077 g of $PbCrO_4$.

History and authority : Introduced and proved by Linstow, *Vjs fur Cer. Med.* 1874, 60; Allen: *Encyclop. Mat. Med*., Vol. VIII, 129; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 864.

Preparation : (a) Trituration 1x Drug strength1/10

Plumbum Chromicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with method H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

POPULUS TREMULOIDES
(Pop. trem.)

Botanical name : *Populus tremuloides* Michx. **Family**: Salicaceae

Common name : *English*: Aspon.

Description : Medium sized tree with light greyish-green bark, becoming dark and furrowed. Leaves small, roundish-ovate with a slightly tapering or truncate or sometimes even semi-cordate at base, finely conate; petiole long, slender. Catkin drooping with silky, deeply 3 to 5-clefts scales or bracts, the pistillate becoming 8 to 10 cm long. Capsules conical, smooth.

Part used : Inner bark.

Microscopical : Bark with cork cells never thickened on outer walls; stone cells in phloem.

Distribution : North America and extending to Mexico in mountains.

History and authority : Introduced and proved by Hale *N. Am. J. of Hom.*, (1867), 391; Allen: *Encyclop. Mat. Med*., Vol. VIII, 154; Clarke: A *Dictionary of Practical Mat. Med.*, Vol. III, 881.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Populus Tremuloides in *coarse powder*	100 g
Purified Water	500 g
Strong Alcohol	533 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x contains one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

PRUNUS PADUS
(Prun. pad.)

Botanical name : *Prunus padus* Linn. **Family**: Rosaceae

Common names : *English*: European bird cherry; *German*: Ahlkerseh.

Description : A shrub or tree up to 15 m tall with purple bark. Leaves oblong-obovate, 5 to 10 cm long, short cuminate, finely and sharply toothed, petioles having two glands. Racemes loose and often dropping, 8 to 10 cm long with white odorous flowers; pedicles 10 to 15 mm long; calyx ovate, oblong, 2 mm long, corolla white, elliptic, 6 to 10 mm long. Fruit edible, nearly black, 6 to 8 mm long.

Part used : Leaf and bark.

Identification : Take 10 g, extract with 100 ml of 60 percent *alcohol;* evaporate and extract the residue with *chloroform*.

(1) Carry out the TLC of *chloroform* extract on silica gel 'G' using *benzene : ethyl acetate* (95 : 5 v/v) as mobile phase and spray with saturated solution of *antimony trichloride* in *chloroform;* four spots appear at R_f 0.92 (light red), 0.55 (pink), 0.35 (blue), 0.25 (light blue).

(2) Take 0.5 ml of the extract, dilute it with 0.5 ml of *methanol* and add one drop of 5 percent aqueous *ferric chloride;* greenish colour is observed.

Distribution : Native of Europe, also found in India and temperate Asia of Korea and Japan.

History and authority : Proved by Lembka, *All Homzeit* 45, 368; Allen: *Encyclop. Mat. Med*., Vol. VIII, 156; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 886.

Preparation : (a) Mother Tincture ϕ Drug strength 1/19

Prunus Padus, moist magma containing solids 100 g and plant moisture 185 ml	285 ml
Purified Water	215 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Despensing Alcohol.*

PYRUS
(Pyrus)

Botanical name : *Pyrus americana* Marsch. **Family**: Rosaceae

Common name : *English*: American mountain ash.

Description : A shrub or tree, up to 10 m high, with smooth, round greyish branches. Leaves odd pinnate, with 13 to 15 leaflets, leaflets lanceolate or narrowly oblong, long acuminate, 5 to 9 cm long, 1/3 to 1/5 cm wide, sharply serrate with pointed teeth, usually glabrous beneath; axillary buds pointed, glabrous and somewhat glutinous. Flowers white, in large and flat cymes; petals obovate, 3 to 4 mm long, narrowed to the base, conspicuously larger than the stamens. Fruit bright red, 4 to 6 mm in diameter.

Part used : Bark.

Identification : Take 10 g, extract with 100 ml of 70 percent *alcohol*:

(1) Carry out TLC of the extract over silica gel 'G' using *n-butanol: acetic acid : water* (4 : 1 : 1 v/v) as mobile phase; on exposure to *iodine vapour* five spots appears at R_f 0.50, 0.72, 0.81, 0.91 and 0.95.

(2) Evaporate 20 ml of the extract on water bath to remove *alcohol*. Then extract the residue with 20 ml *chloroform* and carryout TLC of *chloroform* extract over silica gel 'G' using *n-butanol : acetic acid : water* (4 : 1 : 1 v/v) as mobile phase and 5 percent *methanolic sulphuric acid* as spray reagent. Two brown coloured spots appear at R_f 0.58 and 0.83 after heating the plate.

(3) To 2 ml of the extract, add a solution of *B-naphthol* in concentrated *sulphuric acid;* a green yellow colour appears on warming and pale-orange on dilution.

Distribution : Maine to Pennsylvania and Michigan, southward along the whole length of the Alleghanies, found in swamps and mountain woods.

History and authority : Proved by Katchell, *Amer, Hom. Obs.* Vol. XV, 520; Allen: *Encyclop. Mat. Med*., Vol. X, 623; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1937.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Pyrus in *coarse powder*	100 g
Purified Water	285 ml
Strong Alcohol	740 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol.*

RADIUM BROMIDE

(Rad. br.)

Chemical formula : $RaBr_2$ **Mol. wt.**: 385.88

Description : White or slightly brownish crystals, becoming yellow or pink with age. Soluble in *water* and in *alcohol*. Commercial grade is usually associated with some barium salts. Radioactive.

Specific gravity : 5.79.

History and authority : Proved by Diffenbach; Boericke: *Mat. Med. with Repertory,* 543.

Preparation : (a) Trituration 1x Drug strength 1/10

Radium Bromide	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : (1) Radioactive, powerful corrosive, effect on skin. Handle with care.

(2) Poison! Not to be dispensed below 6x.

Storage : Glass bottles or sealed tubes enclosed in lead sheet.

Revised Monograph Appeared in HPI Vol. X

RANUNCULUS ACRIS

(Ran. acri.)

Botanical name : *Ranunculus acris* Linn. **Family**: Ranunculaceae

Common names : *English*: Tall buttercup; *French*: Renoncule acre; *German*: Scharfhahenfuse.

Description : An annual herb, stem slender, up to 1 m high, more or less pubescent, leafy mostly below the middle, the long branches bearing only a few widely separated greatly reduced leaves. Leaves reniform in general outline, deeply cleft into 3 broadly cuneate-obovate segments, which are in turn incised or cleft into oblong to linear lobes. Petals broadly obovate, often retuse, 8 to 16 mm long, about twice as long as sepals. Fruit an achene in a subglobose head, flat, margined, obliquely obovate, 2 to 3 mm long, beak 0.4 to 1 mm long.

Part used : Whole Plant.

Microscopical : Petiole: in transection through distal end show vascular bundles in adaxially flattened ring, widely spaced and accompanied by patches of pericyclic fibres over phloem.

Stem: circular in outline, vascular bundle in 1 to 2 circles, capped above phloem by patches of sclerenchyma; pith hollow.

Distribution : Native of Europe and introduced in U.S., found in meadows and fields.

History and authority : Proved by Franz *Arch F. Hom.* 7, 3, 218 and Lembke, *N. Zeit, f. Hom. Klin.,* 12, 26; Allen: *Encyclop. Mat. Med*., Vol. VIII, 256; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 944.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Ranunculus Acris in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

RAPHANUS SATIVUS
(Raph. sat.)

Botanical name : *Raphanus sativus* Linn. **Family**: Cruciferae (Brassicaceae)

Synonyms : *Raphanus hortensis* Backer, *Raphanus niger* Mill.

Common names : *Hindi*: Vilaiti Muli; *English*: Garden Radish; *French*: Rave; *German*: Garton-rettich.

Description : An annual or biennial, bristly herb with a variety or colours like grey, pink, red or combinations of grey or even black, spherical or conical or tuberous tap root. Stem simple or branched, erect, 20 to 100 cm. Basal leaves long, lyrately pinnate or pinnatisect, coarsely toothed; cauline leaves simple, linear. Flowers in long terminal recemes, usually white or lilac with purple veins. Fruit inflated, 25 to 90 mm long with a long tapering beak, irregularly constricted and filled inside with white pith between the seeds which are 2 to 8 in number, globose, yellow or brown.

Part used : Root.

Macroscopical : Root and hypocotyl constitute the succulent portion of the plant. Fleshy axis variable in size, shape and colour; spherical or bluntly conical or tuberous; the colour ranging from grey, pink, red and of variously mettled combinating to even black. The flesh white, crisp and tender. Taste sweet, acrid; odour characteristic pungent.

Microscopical : In transection it bears multilayered suberised cork cells; a cork cambium and secondary cortex of thin-walled parenchyma cells; prismatic secondary phloem in a ring, followed by a few layers of secondary cambia and wide xylem. Medullary rays traversing the vascular bundles present. Pith absent.

Distribution : Cultivated throughout India.

History and authority : Proved and introduced by Nussor in 1840; Allen: *Encyclop. Mat. Med.,* Vol. VIII, 277; Hering: *Guiding Symptoms,* Vol. IX, 21.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Raphanus Sativus moist magma containing solids 100 g and plant moisture 300 ml	400 g
Purified Water	200 ml
Strong Alcohol	537 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2X to contain one part Mother Tincture, four parts Purified Water and five parts *Strong Alcohol;* 3X and higher with *Dispensing Alcohol.*

RHAMNUS CATHARTICUS

(Rha. cath.)

Botanical name : *Rhamnus catharticus* Linn. **Family**: Rhamnaceae

Common names : *English*: Buckthorn; *French*: Bourguepine; *German*: Wegdorn.

Description : A deciduous shrub or a small tree, up to 6 m tall with some branches ending in short thorns. Leaves opposite broadly elliptic, oblong or elliptic obovate, minutely serrate, 3 to 6 cm long more than half as wide, lateral veins commonly 3 on each side, strongly curved upward; petiolate; one-third to two-third as long as the blade. Flower greenish-yellow, dioecious, in axillary clusters; sepals 2 mm long; petals erect, lanceolate, 1 to 1.3 mm long in the staminate flowers, 0.6 mm long in the pistillate; style 4 fid for about half its length. Drupe black, 5 to 6 mm in diameter, commonly with 4 stones. Fruit taste bitter and colours the saliva greenish-yellow.

Part used : Fruit.

Microscopical : Powder dusky and consists of numerous fragments of epidermal and subepidermal parenchyma, some of the parenchyma cells containing an amorphous substance, which is coloured purplish-red with *chloral hydrate;* fragments of sarcocarp, thin-walled, parenchyma and secretion cells with oil contents, thick-walled stone-cells with reddish-brown amorphous contents and monoclinic-prisms of calcium oxalate; endocarpic sclerenchyma, thick-walled fibres associated with crystal fibres and numerous fragments of endosperm containing fixed oil and aleurane grains.

Identification : Take 25 ml of 60 percent alcoholic extract. Evaporate on water bath to remove *alcohol*. Extract it with 5 ml *chloroform* twice; evaporate the *chloroform* layer and dissolve the residue in 5 ml of *methanol* and divide in two portions.

(1) To first portion of the residue, add a few drops of 5 percent aqueous *potassium hydroxide;* pink colour develops.

(2) To the second portion, add 0.5 percent methanolic solution of *magnesium acetate;* pink colour develops on heating.

(3) Carry out TLC of *chloroform* extract on silica gel 'G' using *chloroform : methanol* (95 : 5 v/v) as mobile phase and spray with 0.5 percent *magnesium acetate;* three pink spots appear at R_f 0.67, 0.8 and 0.98 corresponding with *aloe emodin*. *Emodin* and *chrysophenol*.

Distribution : Through out Europe, Asia and North Africa.

History and authority : Allen: *Encyclop. Mat. Med*., Vol. VIII, 301.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Rhamnus Catharticus, moist magma containing solids 100 g and plant moisture 400 ml	500 g
Strong Alcohol	625 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

ROBINIA PSEUDOCACIA
(Robinia)

Botanical name : *Robinia pseudocacia* Linn. **Family**: Leguminosae (Fabaceae)

Common names : *English:* Locust; *French:* Robinier; *German:* Falsche Acacien.

Description : A perennial, up to 25 m high with deep furrowed brown bark and prickly branches; young stem and peduncles finely pubescent; stipules frequently modified into stout woody thorns; leaflets 7 to 19, oval to elliptical, round or truncate and mucronate at the apex, glabrous or slightly pubescent while young, 2 to 4 cm long. Flowers white, very fragrant, 2 to 2.5 cm long, many in a pendulous puberlous racemes; calyx finely pubescent, the upper lip truncate or broadly notched. Pods linear-oblong, reddish-brown, flat, 5 to 10 cm long.

Part used : Bark of root and stem.

Microscopical : Root bark: in transverse longitudinal section consisting of a periderm with a phloem, 18 to 20 cells wide; a phellogen and a phelloderm, forming at places rhytodomes(enclosing secondary cortical secondary parenchyma between alternating zones of phellm); phloem rays, spindle shaped, 2 to 8 cells, wide, other constituents phloem parenchyma and sieve tubes, bast, crystal fibres; brachysclereid at times among phloem parenchyma. Powder: crystal fibres, 1050 to 2100 µ by 60 to 90 µ with rhomboid crystals 60 to 90 µ by 45 to 52.5 µ; sieve tubes 165 to 231 µ by 26.9µ; brachysclereid 40 to 92 µ by 30 to 60 µ.

Stem bark: in radial longitudinal section consisting a wide periderm, containing alternate zones of phellm, secondary cortical and phloem parenchyma (forming rhytodomes); numerous sclerenchyma and crystal fibres distributed all over and brachysclerids towards the periphery, phloem rays at right angles to the phloem parenchyma, sieve tubes, bast and crystal fibres. In transverse longitudinal section phloem rays spindle shaped, 3 to 9 cells wide, parallel to the phloem parenchyma, sieve tubes, bast and crystal fibres; rhomboid crystals 16 to 24 µ by 9.0 to 16 µ.

Identification : (1) To 2 ml of alcoholic extract, add 0.5 ml of 10 percent aqueous *lead acetate* solution; a yellowish-brown colour is produced.

(2) To 2 ml of alcoholic extract, add a little *magnesium metal* powder and a few drops of dilute *hydrochloric acid*; the solution becomes red.

(3) To 2 ml of alcoholic extract, add 2 drops of *alcoholic ferric chloride* solution; the solution becomes green, turns black on standing.

(4) T.L.C. with *benzene* : *pyridine* : *formic acid* (30 : 9 : 5) as mobile phase and spraying with *ammonia*, seven spots visible under UV light at R_f 0.93, 0.80, 0.71, 0.36, 0.20, 0.95, 0.59.

Distribution : United States, Southern Pennysylvania to Illinois, extensively naturalised in Europe, cultivated in India (Simla).

History and authority : Introduced by Burt in 1864, *American Hom. Obs.* I, 61; Allen: *Encyclop. Mat. Med.*, Vol. VIII, 402 and Vol. X, 608.

Preparation : (a) Mother Tincture ϕ

	Drug strength1/10
Robina Pseudocacia in *coarse powder*	100 g
Purified water	185 ml
Strong Alcohol	840 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

SANTONINUM
(Santon.)

Chemical formula : $C_{15}H_{18}O_3$ **Mol. Wt.**: 246.30

Common names : *English* and *French:* Santonine; *German:* Santonina.

Description : Colourless, flat, rhombic prisms or a white, crystalline powder; odourless; taste bitter. Turns yellow on exposure to light and irritates mucus membranes. Almost insoluble in *water;* sparingly soluble in *alcohol;* freely soluble in *chloroform.* A crystalline lactone obtained from various species of *Artemisia* (**Family**: Chompositate). Contains not less than 99.0 percent of $C_{15}H_{18}O_3$.

Identification : Warm 10 mg with 1 ml of a 10 percent *alcoholic potassium hydroxide solution*, a violet-red colour is produced.

Melting range : 171° to 174°, H.P.I., Vol. I,

Reaction : 0.1 g in 5 ml of *alcohol* (95.0 percent) forms a clear solution, neutral to *litmus.*

Colour of solution : A 20 percent w/v solution in *chloroform* shows no yellow colour.

Alkaloids : To 0.1 g add a mixture of 4 ml of *water* and 1 ml of *dilute sulphuric acid*, dilute, heat to boiling, cool and filter. The filtrate gives no precipitate with *potassium mercuric iodide solution.*

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I,

Assay : Take about 0.4 g, accurately weighed, in a flask, add 25 ml *alcohol* and 25 ml of 0.1 N *sodium hydroxide.* Boil under a reflex condenser for 2 minutes and titrate with 0.1 N *hydrochloric acid* using *phenolphthalein* as indicator. Repeat the operation in the same manner omitting the substance. Each ml of 0.1 N *sodium hydroxide* is equivalent to 0. 02463 g of $C_{15}H_{18}O_3$.

History and authority : Introduced by Knoblauch, Deutsch Klin., 1834-5; Allen: *Encyclop. Mat. Med.,* Vol. VIII, 497.

Preparation : (a) Trturation 1x — Drug strength 1/10

Santoninum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

SOLANUM CAROLINENSE
(Sol. caro.)

Botanical name : *Solanum carolinense* Linn. **Family**: Solanaceae

Common name : *English:* Hours nettle.

Description : A perennial herb. Stem erect, branches, up to 1 m spiny, loosely stellate-pubescent. Leaves ovate, 7 to 12 cm long and about half as wide, with 2 to 5 large teeth or shallow lobes on each side, more or less spiny along the principal veins, stellate-pubescent on both sides, the hairs sessile with 4 to 8 branches, the central branch often elongate. Inflorescence several flowered, elongating at maturity and forming a simple racemiform cluster. Corolla pale-violet to white, about 2 cm wide. Anthers equal. Fruit a berry, yellow, 1 to 1.5 cm in diameter, subtended but not enclosed by the calyx, 2-celled.

Part used : Whole plant.

Identification : (1) Take 5 ml of the 60 percent *alcoholic* extract and evaporate to dryness. To the residue add 2 ml of *water* and 1 ml of 10 percent *sodium bicarbonate solution*; effervescence is observed.

(2) To 2 ml of the *alcoholic* extract, add one drop of *ammonium ferric sulphate;* a dirty yellow precipitate produced which disappears immediately turning the solution to red colour.

Distribution : South America, Florida and other States of U.S.A.

History and authority : Introduced by Grahn, *H.R.* XII, 462; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1207.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Solanum Carolinense in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part *Mother Tincture*, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

Revised Monograph Appeared in HPI Vol. X

SOLIDAGO VIRGAUREA
(Sol. vir.)

Botanical name : *Solidago virgaurea* Linn. **Family**: Compositae (Asteraceae)

Synonyms : *Solidago virgaurea* var. *alpina* Bigel.

Common names : *English:* Goldenrod; *French:* Verge d' or; *German:* Goldrute.

Description : A deciduous, perennial herb, 30 to 90 cm in height with an oblique thin rhizome. Radical leaves, 5.0 to 5.5 cm wide, elliptical, acute, tapering into a petiole, slightly serrate, the cauline one lanceolate sessile or narrowed into margined petioles. Flowers in dense terminal, narrow and often interrupted thyrus, 20 to 30 cm long, bracts of the involucre acute or acutish.

Part used : Flowering top.

Identification : Extract in 60 percent *alcohol* and test as follows:

(i) Warm 3 ml of extract with 1 ml of *resorcinol* in *hydrochloric acid* and cool; a dark red turbidity is produced.

(ii) Evaporate 5 ml of the extract and dissolve in small quantity of *alcohol.* Add a little of *magnesium powder* followed by concentrated *hydrochloric acid;* a pink colour is produced.

(iii) To 1 ml of the extract, add 10 ml of *water* and 1 drop of *sodium hydroxide solution;* a yellow precipitate is produced.

Distribution : Alpine districts of North New England, Northern United State and Europe.

History and authority : Introduced by Rademacher's and Gucken, *H.R.,* IV, 205; Clarke: *Dictionary of Practical Mat. Med.,* Vol. III, 1219.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Solidago Virgaurea in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol.*

STERCULIA ACCUMINATA
(Ster. ac.)

Botanical name : *Cola accuminata* Schott. **Family**: Sterculiadceae

Synonym : *Sterculia accuminata* Ban.

Common name : *English:* Kola nut.

Description : A tree, up to 12 m high. Leaves oblong, 15 to 20 cm long, pointed at both ends, glabrous. Flowers unisexual, apetalous; calyx 5, bi-fid beyond the middle, furfuraceous, lobes oblong, pointed; anthers and carpel sessile. Fruit yellowish-brown consisting of 5 woody follicles, each containing 1 to 3 white or red, albuminous seeds.

Part used : Nut.

Identification : Evaporate 20 ml of 90 percent alcoholic extract to remove *alcohol*. Make it alkaline with *ammonia solution* and extract with *chloroform.*

(1) Carry out TLC of *chloroform* extract on silica gel 'G' using *methanol : ammonia* (100 : 1.5 v/v) as mobile phase; under UV light one spot appears at R_f 0.45 (blue fluorescence); on spraying with *iodoplatinate* reagent one more spot appears at R_f 0.22.

(2) Carryout TLC of aqueous extract on silica gel 'G' using *methanol : ammonia* (100 : 1.5 v/v) as mobile phase and on spraying with *iodine vapour* two spots appear at R_f 0.30 and 0.80.

Distribution : Naturalised in Trinidad; cultivated in Jamaica; Western and Central Tropical Africa, West Indies, Brazil and Congo.

History and authority : Boericke: *Mat. Med. and Repertory,* 9th Edn., 609.

Preparation : (a) Trituration 1x — Drug strength 1/10

Sterculia Accuminata in *coarse powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

STRONTIUM CARBONICUM

(Str. carb.)

Chemical formula : $SrCO_3$ **Mol. wt.**: 147.63

Common names : *English:* Strontium carbonate; *French*: Carbonate de Strontiene; *German:* Kohlensaurer Strohtaian.

Description : White, odourless and tasteless powder. Soluble in *dilute nitric acid* and *acetic acid;* insoluble in *water.* Contains not less than 99.0 percent of $SrCO_3$ with reference to the substance dried to constant weight at 105º.

Identification : (a) Yields the reactions characteristic of *strontium* and *carbonates,* H.P.I., Vol. I,

(b) Dissolve 0.1 g in 10 ml of *dilute hydrochloric acid*. Place a drop of the solution on filter paper previously impregnated with a saturated solution of *potassium chromate,* add a drop of 0.2 percent solution of *sodium rhodizonate* prepared in *water;* a brownish-red flock or circle is produced.

Chloride and Sulphate: 10 g complies with the *limit test for chlorides,* H.P.I., Vol. I, and for *sulphates***,** H.P.I., Vol. I,

Heavy metals : Not more than 10 parts per million, H.P.I., Vol. I,

Iron : 2 g complies with the *limit test for iron,* H.P.I., Vol. I,

Alkali and magnesium: To 1 g, add 10 ml of *water* and add drop wise *hydrochloric acid* until just dissolved. Dilute with 35 ml of *water*, heat to boiling and add 5 ml of 25 percent *sulphuric acid.* Cool to room temperature, add 50 ml of *alcohol* and *water* in quantity sufficient to make 100 ml. Mix and filter. Evaporate 50 ml of the filtrate in a tared dish to dryness, heat gently to expel excess of the *sulphuric acid* and finally ignite to constant weight. The weight of residue should not exceed 1 mg.

Alkali carbonates : Boil 1 g with 25 ml of *water* for 5 minutes. Cool, dilute to 25 ml and filter. To the filtrate add 2 drops of *pherolphthalein.* If a pink colour is produced, not more than 0.5 ml of 0.01 N *hydrochloric acid* is required to discharge pink colour.

Assay : Dissolve about 0.3 g, accurately weighed, in 5 ml *dilute hydrochloric acid* and dilute with *water* in quantity sufficient to make 100 ml. Add slowly a ten-fold excess of *dilute sulphuric acid* and *alcohol* in volume equal to that of the solution. Stir well and allow to stand for at least 12 hours. Transfer the precipitate to a tared glass crucible. Wash with 75 percent *alcohol* to which a few drops of *sulphuric acid* have been added and finally with *alcohol*

until the washings are free from sulphate. Dry and ignite the precipitate at dull redness to constant weight.

History and authority : Proved by Nenning, Schreter, Seidel, Trinks and Woost; Hartlaub and Trinks, *R.A.M.L.;* Allen: *Encyclop. Mat. Med.*, Vol. IX**,** 224; Hering: *Guiding Symptoms,* Vol. X, 89; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1281.

Preparation : (a) Trituration 1x

	Drug strength1/10
Strontium Carbonicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

STRYCHNINUM NITRICUM

(Stry. nit.)

Chemical formula : $C_{21}H_{22}O_2N_2HNO_3$ **Mol. Wt**: 397.40

Description : Colourless, shining needles; odourless; taste very bitter. Sparingly soluble in *water;* slightly soluble in *alcohol*. Decomposes on warming. Contains not less than 97.5 percent of $C_{21}H_{22}O_2N_2HNO_3$ with reference to the substance dried to constant weight at 105º.

Identification : (1) Dissolve a few crystals in 2 or 3 drops of *sulphuric acid* on a white porcelain plate, add a small crystal of *potassium dichromate;* an intense violet colour changing to red and finally to yellow is produced.

(2) Moist a few crystals with 2 to 3 drops of *sulphuric acid,* add about 50 mg of *ammonum vanadate* and stir the mixture well; a deep violet colour is produced, which changes to red after sometime; on dilution with *water* the liquid assumes a cherry-red colour.

(3) Yields the reactions characteristic of *nitrates.*

Assay : Weigh accurately about 0.5 g, add 40 ml of *water,* 12.5 ml of *dilute ammonia solution* and 25 ml of *chloroform,* shake well and allow to separate; repeat the extraction with 25 ml quantities of *chloroform* until complete extraction of the alkaloid is affected. Combine the *chloroform* extract with *water* and evaporate to a small volume. Add 5 ml of *alcohol,* evaporate and dry for half an hour at 100º. Moisten the residue with 1 ml of *alcohol* and 20 ml of 0.1 N *sulphuric acid;* boil, cool and titrate with 0.1 N *sodium hydroside* using *solution of methyl red* as indicator. Each ml of 0.1 N *sulphuric acid* is equivalent to 0.03974 g of $C_{21}H_{22}O_2N_2HNO_3$.

History and authority : Proved by Camper; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1289.

Preparation : (a) Trturation 2x — Drug strength 1/100

Strychninum Nitricum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Not to be dispensed below 3x.

STRYCHNINUM PHOSPHORICUM

(Stry. phos.)

Chemical formula : $C_{21}H_{22}N_2O_2.H_3PO_4.\ 2H_2O$ **Mol. Wt**: 468.00

Common name : *English:* Strychnine phosphate.

Description : White crystalline powder, soluble in *water*, slightly soluble in *alcohol.* Contains not less than 97.5 percent and not more than the equivalent of 100.5 percent of $C_{21}H_{22}N_2O_2.H_3PO_4.2H_2O$ calculated with reference to the substances dried to constant weight at 130°.

Identification : (i) Dissolve about 0.1 mg in 0.2 ml of *sulphuric acid* and slowly move a small crystal of *potassium dichromate* through the solution; an intense violet colour is produced, which changes through red to yellow.

(ii) To about 0.5 mg add 0.2 ml of *sulphuric acid* followed by 0.05 g of *ammonium vandate* and stir; a deep violet colour is produced, which changes to red; add 1 ml of *water*, the colour changes to cherry red.

(iii) Gives reaction characteristics of *phosphates.*

Reaction : Aqueous solution is acidic to *litmus.*

Sulphate : 0.25 g complies with the *limit test for sulphates.*

Brucine : To about 0.1 g add 1 ml of a mixture of equal volumes of *nitric acid* and *water;* no red or reddish colour is produced.

Sulphated ash : Not more than 0.1 percent.

Assay : Weight accurately about 0.5 g and transfer to a separating funnel, add 40 ml of *water*, 12 ml of *dilute ammonium hydroxide solution* and 25 ml of *chloroform*, shake well and allow to separate. Run off the lower layer and repeat the extraction with 25 ml quantities of *chloroform* until complete extraction of the alkaloids is affected. Wash each c*hloroform solution* with the same 20 ml of *water* contained in a second separating funnel, mix the chloroform solutions, evaporate to a small volume, add 5 ml of *alcohol*, evaporate and dry for half an hour at 100°. Moisten the residue with 1 ml of *alcohol*, add 20 ml of 0.1 N *sulphuric acid*, boil, cool and titrate with 0.1 N *sodium hydroxide* using *methyl red* as indicator. Each ml of 0.1 N *sulphuric acid* is equivalent to 0.0468 g of $C_{21}H_{22}N_2O_2.H_3PO_4.2H_2O$.

History and authority : Proved by Clarke; Boericke: *Mat. Med. and Repertory*, 9th Ed., 618; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1289.

Preparation : (a) Trituration 2x — Drug Strength 1/100

Strychninum Phosphricum	10 g
Saccharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Not to be dispensed below 3x.

STRYCHNINUM SULPHURICUM

(Stry. sul.)

Chemical formula : $(C_{21}H_{22}N_2O_2)_2H_2SO_4.\ 5H_2O$ **Mol. wt**.: 857.0

Common name : *English:* Sulphate of Strychnin; *French:* Sulfate de strychnin; *German:* Schwefelsaures strychnin.

Description : Colourless or transparent, odourless crystals or white crystalline powder; taste intensely bitter; efflorescent in dry air. Sparingly soluble in *water,* slightly in *alcohol, chloroform,* freely soluble in *glycerin* and insoluble in *ether.*

Identification : (i) Gives reaction characteristics of *sulphates,* H.P.I., Vol. I,

(ii) Dissolve 0.5 g in *water,* make it alkaline, extract with *chloroform* and dry to constant weight; melting point the substance (strychnine) about 268°.

(iii) To 0.05 mg, add 0.2 ml of *sulphuric acid,* followed by 0.05 g of *ammonium vanadate* and stir; deep purple colour is produced, which on addition of 1 ml *water* changes to cherry red, which persists for some time.

(iv) Dissolve 0.1 mg in 0.2 ml of *sulphuric acid* and slowly move a small crystal of *potassium dichromate* through the solution; a dark violet colour is produced which changes through red to yellow.

Reaction : A 1 percent solution in *water* neutral to *methyl red.*

Chloride : 0.4 g complied with the *limit test of chloride* H.P.I., Vol. I,

Assay : Dissolve about 0.5 g in 10 ml of *water,* make alkaline with *ammonia solution* and extract with *chloroform* 2 ml each; evaporate combined *chloroform* extracts, dissolve the residue in 5 ml of *alcohol,* previously neutralised to *methyl red;* add 25 ml of 0.1 N *sulphuric acid* and titrate the excess of acid with 0.1 N *sodium hydroxide* using *methyl red* indicator. Repeat the blank without *strychnine,* each ml of 0.1 N *sodium hydroxide* is equivalent to 0.085656 g of $(C_{21}H_{22}N_2O_2)_2H_2SO_4.\ 5H_2O$.

History and authority : Introduced by Hale; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1291.

Preparation : (a) Trituration 2x — Drug strength 1/100

Strychninum Sulphuricum	10 g
Schharum Lactis	990 g

to make one thousand grammes of the trituration.

(b) Potencies: 3x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

SULPHANILAMIDE

(Sul. amid.)

Chemical formula : $C_6H_8O_2N_2S$ **Mol. wt.**: 172.20

Common name : *English*: p-amino benzenesulphonamide.

Description : Colourless crystals or a white crystalline powder; soluble in *water* and in solutions of alkali hydroxides; sparingly soluble in *alcohol*; insoluble in *chloroform.* Odourless; taste slightly bitter but sweet afterwards. Contains not less than 99.0 percent and not more than equivalent of 100.5 percent of $C_6H_8O_2N_2S$ calculated with reference to the substance dried to constant weight at 105º.

Identification : (a) Heat about 10 mg an intense violet-blue colour is produced and on further heating the odour of *aniline* and *ammonia* are recognisable.

(b) Yields reactions characteristic of *primary-aromatic amines.*

Reaction : A saturated solution in *water* is neutral to *litmus*.

Melting point : 165º.

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I,

Iron : Ignite 1 g and fuse the residue with 1 g *anhydrous sodium carbonate;* cool and dissolve the residue in 15 ml of *dilute hydrochloric acid* and dilute to 45 ml with *water;* the solution complies with the *limit test for iron,* H.P.I., Vol. I,

Lead : Not more than 10 parts per million, H.P.I., Vol. I,

Chloride : 1 g complies with the *limit test for chlorides,* H.P.I., Vol. I,

Alkali insoluble matter: 1 g dissolves completely in 5 ml of 10 percent of w/w solution of *sodium hydroxide* in *water.*

Loss on drying : When dried to constant weight at 105º, loses not more than 0.5 percent of its weight.

Sulphated ash : Not more than 0.1 percent, H.P.I., Vol. I,

Assay : Dissolve about 0.5 g, accurately weighed, in 75 ml of *water* and 10ml *hydrochloric acid*. Adjust the temperature of the solution below 15º and titrate slowly with M/10 *sodium nitrate* until a distinct blue ring is immediately produced, when a drop of the titrated solution is placed on *starch-iodide paper,* 5 minutes after the last addition of the M/10 *sodium nitrate,* which should be added in quantities of 0.1 ml towards the end of the titration. Perform a

blank experiment. The difference between the two titrations represent the amount of sodium nitrite required to diazotise the *sulphanilamide*. Each ml of M/10 sodium nitrate is equivalent to 0.01722 g of $C_6H_8O_2N_2S$.

History and authority : Proved by Sutherland; *The Homoeopathic Recorder*, 55, 29-37, 1940, 59, 90-100, 1943.

Preparation : (a) Trituration 1x — Drug strength 1/10

Sulphanilamide	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 6x to be kept in well-closed containers protected from light.

SYMPHORICARPUS RACEMOSUS

(Sym. rac.)

Botanical name : *Symphoricarpus racemosus* Auct. **Family**: Caprifoliaceae

Synonyms : *S. albus* (Linn.) Blacke var. *laevigatus* (Fern) Blacke, *Vaccinium album* Linn.

Common name : *English*: Snow berry.

Description : A deciduous shrub, 1 to 3 m in height, spreading underground. Leaves, numerous yellowish-brown and glabrous, 2 to 4 cm, oval or ovate, obtuse, cuneate or rounded at base, entire or a few sinuately lobed, dull green and glabrous or sparsely pilose below; petiole 5 mm; leaves of the sucker shoots often conspicuously lobed. Flowers 3 to 7, in terminal spike like racemes, 2 mm or less; bracts and bractioles ovate, small, calyx 4 to 5 toothed, corolla 5 to 6 mm or less; bracts and bractioles ovate, small, calyx 4 to 5 toothed, corolla 5 to 6 mm campanulate, pink, hairy at the throat within. Fruit 1 to 1.5 cm globose, snow white berry.

Part used : Berry.

Identification : Take 20 to 25 ml of alcoholic extract and remove *alcohol*. Extract with *chloroform*, keep the aqueous extract separately.

(1) Carry out TLC of the *chloroform* extract on silica gel 'G' having mobile phase *benzene : methanol* (95 : 5); it gives four spots in UV light at R_f 0.14, 0.30, 0.37 and 0.83. On spraying with solution of *antimony trichloride* in *chloroform*, five spots appear after heating at R_f values 0.14, 0.24, 0.30, 0.49 and 0.65. Spots at R_f 0.30, 0.49 and 0.65 are violet, while spots at R_f 0.14, 0.24 are of brownish-red colour.

(2) Carry our TLC of the aqueous extract on silica gel 'G' having mobile phase *ethyl acetate* : *butanone* : *formic acid* : *water* (5:2:2:1); it gives two spots (blue fluorescence) in UV light, having R_f 0.68 and 0.73 and on spraying with *aniline phathalate* and on heating at 120° for 15 minutes; a yellowish-brown spot appears at R_f 0.47.

Distribution : Native of western North America from Alaska and Alberta to California and Colorado.

History and authority : Introduced by Burdick; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1339; Anshutz: *New and Old Forgotten Remedies*, 391.

Preparation : (a) Mother Tincture ϕ Drug strength 1/ 10

Symphoricarpus Racemosus in *coarse powder* 100 g

Purified Water	200 ml
Strong Alcohol	824 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

TAMUS COMMUNIS
(Tamus c.)

Botanical name : *Tamus communis* Linn. **Family**: Dioscoreaceae

Common names : *English*: Black Bryony; *French*: Le tamier; *German*: Schwarzwurzel.

Description : Perennial herb, stem twining, angled, up to 30 cm long. Leaves alternate, heart shaped, finely pointed, dark green and glossy, stalked. Flowers small, yellowish-green, unisexual, sexes on different plants, in recemes from leaf axils. Perianth bell-shaped with short tubes and 6 narrow spreading lobes. Male flower with 6 stamens; female flower with inferior 3-celled ovary with 2 ovules in each locule. Style one divided above into 3 two-lobed stigmas. Fruit globose, red berry containing 1 to 6 seeds. Seeds with endosperm, globose, pale yellow, wrinkled. Average weight 0.016 g.

Part used : Root.

Identification : Evaporate 20 ml 50 percent alcoholic extract to remove *alcohol*. Extract the remaining portion with 25 ml *chloroform* and separate *chloroform* of aqueous layers.

(1) Carry out TLC of *chloroform* extract on silica gel 'G' using *chloroform* : *methanol* (97 : 3 v/v) as mobile phase. Under UV light four spots appear at R_f 0.30, 0.50, 0.55 and 0.70 (all blue fluorescence). On spraying with *antimony trichloride* and heating at 100º for 15 minutes one additional spot appears at R_f 0.85 (bluish-violet) and the spot at R_f 0.70 also turns bluish-violet in colour.

(2) Carry out TLC of aqueous layer on silica gel 'G' using *R-butanol* : *acetic acid* : *water* (4 : 1 : 1 v/v) as mobile phase and *alcoholic ferric chloride* and *anilinephthalate* as spray reagents on two separate plates. With *alcoholic ferric chloride reagent* (5 percent) one spot appears at R_f 0.32 (red) and on spraying with *aniline phthalate* and heating the plate at 100º for 15 minutes, one spot appears at R_f 0.32 (light yellow).

Distribution : South and Western Europe, North America and Asia minor.

History and authority : Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1364; Boericke: *Mat. Med. with Repertory*, 9th Edn., 23.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Tamus Communis in *coarse powder*	100 g
Purified Water	500 ml
Strong Alcohol	573 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, five parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

TANACETUM VULGARE
(Tan. vulg.)

Botanical name : *Tanacetum vulgare* Linn. **Family**: Compositae (Asteraceae)

Common names : *English*: Tansy; *French*: Tanaisie; *German*: Rainfern.

Description : A coarse aromatic, perennial, with a stout rhizome, glabrous throughout. Leaves sessile or short petioled, punctate, pinnatified with evidently winged rachis, the pinnagte again pinnatified or deeply lobed with broadly winged rachis, the pinnules often again toothed. Heads discoid, numerous, about 20 to 200, the disk about 5 to 10 mm wide. Flowers yellow in dense terminal corymbs. Pappus a minute crown almost obsolute.

Part used : Leaf and flowering twig.

Identification : (1) Evaporate 20 ml 50 percent alcoholic extract to 2 ml and spot on a silica gel 'G', develop in *chloroform* solvent and spray with saturated solution of *antimony trichloride* in *carbon tetrachloride*. Four spot with R_f 0.09 (bluish-pink), 0.23 (blue), 0.35(pink), 0.83 (pink) are produced.

(2) Spot the evaporated extract on silica gel 'G' and develop in *benzene* : *methanol* (95 : 5). Spray with 2-4 *di-nitrophenyl hydrozine* in 2 N *hydrochloric acid*. Four spots developed at R_f 0.06 (greenish), 0.085 (pink), 0.14 (dirty pink), 0.19 (dirty pink).

Distribution : United States and Europe.

History and authority : Introduced by Hering, *Archiv,* 13, 1, 170; Allen: *Encyclop. Mat. Med.*, Vol. IX, 503.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Tanacetum Vulgare in *coarse powder*	100 g
Purified Water	350 ml
Strong Alcohol	687 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

THALLIUM
(Thal.)

Chemical formula : Tl **At. wt.**: 204.37

Common name : *English*: Thallium.

Description : Bluish white metal, hexagonal crystals closely packed, in elastic, easily fusible very soft, leaves streak on paper on marking; oxidises superficially in air forming a coating of Tl_2O; readily amalgamates with mercury. Insoluble in *water;* contains not less than 99.5 percent of Tl.

Identification : (1) Dissolve about 10 mg in *dilute sulphuric acid* and add a few drops of 10 percent *potassium iodide solution;* a yellow precipitate is produced which is insoluble in *sodium thiosulphate solution.*

(2) Dissolve 1 g in minimum quantity of *sulphuric acid* and dilute to 100 ml. Place a drop of the solution on a filter paper followed by addition of a drop of *phosphomolybdic acid solution* and one drop of 50 percent *hydrobromic acid;* a dark or light blue stain is produced.

Arsenic : Not more than 20 parts per million, H.P.I., Vol. I,

Chloride : Not more than 100 parts per million, H.P.I., Vol. I,

Sulphate : Not more than 100 parts per million, H.P.I., Vol. I,

Heavy metals : Not more than 20 parts per million, H.P.I., Vol. I,

Assay : Dissolve 0.1 g in minimum quantity of *sulphuric acid*, dilute with 10 ml of *water*. Neutralise the solution with *dilute ammonia solution.* Heat to about 80º and add 2 g of *potassium chromate.* Allow to stand at room temperature for at least 12 hours. Filter and wash with 1 percent *potassium chromate solution* then with 50 percent *alcohol* and dry at 120º to constant weight, weigh as Tl_2CrO_4; each g of the residue is equivalent to 0.7786 g of Tl.

History and authority : Proved by Lamy and Miame; Allen: *Encyclop. Mat. Med.*, IX, 582.

Preparation : (a) Trituration 1x — Drug strength 1/10

Thallium in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Poisonous! Not to be dispensed below 3x.

THEA CHINENSIS
(Thea)

Botanical name : *Camellia sinensis* Linn. Kuntz. **Family**: Theaeceae

Synonyms : *Thea sinensis* Linn., *Camellia thea* Link, *C. theifera* Griff.

Common names : *Hindi*: Chai; *English*: Tea; *French*: The vert imperial; *German*: Chinesicher Thee.

Description : Evergreen shrub, with many alternate branches. Leaves elliptic-lanceolate or obovate-lanceolate, short petioled, acuminate serrate on the margins, smooth on both sides, occasionally pubescent beneath, green, shiny pinnately veined, with prominent midrib. Flowers pedicellate, white, auxiliary; sepals orbicular, glabrous with membranous ciliate edges; petals obovate, obtuse, glabrous or pubescent on back; stamens numerous, ovary villous; styles 3, glabrous, connate for two thirds of their length. Capsule depressed leathery, three cornered, one to rarely two-seeded. Seed about 1.8 cm in diameter, nearly globose or obtusely angled, smooth, pale brown with shining hard testa.

Part used : Green leaf.

Macroscopical : 5 to 10 cm long, usually broadly lanceolate, firm in texture, rather thick, each tapering to a short petiole. Upper surface glossy, under surface pubescent in young leaves but nearly glabrous in older leaves. The serrated margin is slightly inrolled and bears characteristic shrunken, glandular teeth, which readily break off. Odour agreeable aromatic; taste bitter and astringent.

Assay : Transfer about 5 g accurately weighed to a 500 ml flask. Add 10 g of *heavy magnesium oxide* and 200 ml of *water.* Reflux for two hours gently. Cool, dilute to 500 ml and filter. To the filtrate add 10 ml of 50 percent *sulphuric acid* and boil until the volume is reduced to 100 ml, filter in a separating funnel, wash the flask with 1 percent *sulphuric acid.* Combine filtrates and washings. Make alkaline with 10 percent *potassium hydroxide solution.* Extract with six successive quantities each of 25, 20, 15, 10, 10 and 10 ml. Combine the chloroform extracts and wash with 5 ml of 1 percent *potassium hydroxide solution.* The chloroform layer is filtered through cotton containing *anhydrous sodium sulphate.* The filtrate is evaporated in a tared crucible and weighed to constant weight at 105º. It should weigh not less than 0.015 g.

Distribution : Grown in Assam, Sikkim and Darjeeling in the Himalayas and Nilgiris.

History and authority : Proved and introduced by Roth, *Mat. Med.* I, 510; Allen: *Encyclop. Mat. Med.,* Vol. IX, 583; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1406.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Thea Chinensis in *coarse powder*	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water and six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

THIOSINAMINUM

(Thiosin.)

Chemical formula : $NH_2CSNHCH_2CH_2CH_2$ **Mol. wt.**: 116.19

Common name : *English*: Allylthiourea.

Description : White aromatic crystals; garlic like odour; taste bitter. Freely soluble in *water* and very soluble in *alcohol;* slightly soluble in *ether;* insoluble in *benzene.* Prepared by warming a mixture of equal parts of *allyl mustard oil* and *absolute alcohol* with an equal amount of 30 percent *ammonia.*

Melting point : 76° to 78º.

Identification : (i) A solution in *water* gives white precipitate with *mercuric chloride solution* and *silver nitrate solution* and a grey precipitate with *mercurous nitrate solution.*

(ii) When heated, white alcoholic vapours are evolved and a carbonaceous residue is left.

History and authority : Introduced by Alfred, Moore and Aushutz: *New old and Forgotten Remedies.*

Preparation : (a) Trituration 1x Drug strength1/10

Thiosinaminum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Revised Monograph Appeared in HPI Vol. X

THLAPSI BURSA PASTORIS

(Thal. b. p.)

Botanical name : *Capsella bursa pastoris* Moench.

Family: Cruciferae (Brassicaceae)

Common names : *English:* Shepherd's Purse; *French:* Bourse de Pasture; *German:* Hirtentasche.

Description : A glabrous or hairy herb, with long and tapering root, 15 to 20 cm tall, sparingly branched. Basal leaves oblong, 5 to 10 cm long, pinnately lobed, cauline leaves much smaller, lanceolate to linear, entire or denticulate, auriculate at base; recemes at anthesis congested, at maturity, greatly elongate, often forming half the total height of the plant, pedicels at maturity widely spreading, 1 to 2 cm long. Flowers 2 mm wide; petals about twice as long as the sepals. Fruit obcordate-triangular, 5 to 8 cm long, the lateral margins straight or outwardly curved.

Part used : Whole plant.

Microscopical : Leaf: shows single layer of papillose epidermal cells with stellate trichomes; stomata on the epidermis; mesophyll differentiated into palisade and spongy parenchyma cells; midrib having 1 to 3 vascular bundles with xylem towards the upper epidermis and phloem towards the lower epidermis; each vascular bundle capped on both sides by sclerenchyma cells.

Stem: shows single layer of columnar epidermal cells; wide zone of cortex of parenchymatous cells; distinct primary bundles composed of xylem parenchyma, xylem vessels, cambium and a fairly large phloem interrupted by ray cells; pericycle sclerenchymatous only above the primary phloem. Secondary xylem and secondary phloem formed by inter-fascicular cambium, at places it fails to form secondary phloem; large pith of isodiametric parenchyma cells.

Root: shows cork; cork cambium; secondary cortex of parenchymatous cells; single layered endodermis; xylem of xylem parenchyma cells; wide phloem zone composed of phloem parenchyma, ray cells and bast, pith absent.

Distribution : A weed of cultivation throughout India, particularly abundant in North-Western Himalayas.

History and authority : Proved by Macfarlan and Mc George; Hering: *Guiding Symptoms,* Vol. X, 304.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Thlapsi Bursa Pastoris containing solid 100 g, Plant moisture 233 ml	333 g
Purified Water	200 ml
Strong Alcohol	600 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, three parts Purified Water, six parts *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

THYMOLUM
(Thymol)

Chemical formula : $C_{10}H_{14}O$ **Mol. wt**.: 150. 20

Common names : *English*: Isopropyl meta cresol, 2-isopropyl-5-methylphenol.

Description : Obtained from oils of thymol, *Thymus vulgaris* (Labiatae or Lamiaceae), *Monarda punctata* (Labiatae or Lamiaceae) and *Trachyspermus amin* (Ajewan) (Umbelliferae or Apiaceae) or it may be prepared synthetically. Colourless crystals, odour characteristic; pungent, aromatic and taste. Slightly soluble in *water* and *glycerol;* very soluble in *alcohol*, *chloroform* and *ether*. Also soluble in many volatile and fixed oils. It sinks in cold *water* but when temperature raised to about 45º, it melts and rises to the surface.

Identification : (i) When 1 g is heated in a test tube in a water bath with 5 ml of a 10 percent w/v *solution of sodium hydroxide*, a clear, colourless or pale red solution is formed which becomes darker on standing; but no oily drops separate. On adding a few drops of *chloroform* and shaking; a violet colour is produced.

(ii) Dissolve a small crystal in 1 ml of *glacial acetic acid* and add 6 drops of *sulphuric acid* and 1 drop of *nitric acid;* the liquid shows a deep bluish-green colour when viewed by reflected light.

Freezing point : Not below 49º.

Reaction : A solution in *alcohol* is neutral to *litmus.*

Non-volatile matter : Leaves not more than 0.05 percent of residue when heated in an open dish on a water-bath and dried to constant weight at 105º.

History and authority : Introduced by Griggs, *The Hahnemannien,* 76; 657-667, 1941.

Preparation : (a) Mother Tincture ϕ Drug strength 1/10

Thymolum 100 g

Dispensing Alcohol in sufficient quantity

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

Storage : Preparation below 6x to be kept in well-closed containers protected from light.

TILIA EUROPAEA

(Til. euro.)

Botanical name : *Tilia vulgaris* Hayne. **Family**: Tiliaceae

Synonyms : *Tilia intermedia* D.C., *Tilia europaea* Linn.

Common name : *English*: Common Linden.

Description : Deciduous tree, up to 36 m, young branchlets glabrous. Leaves broadly ovate, abruptly acuminate, oblique, cordate or truncate at the base, serrate with short pointed teeth, dark green above, light green beneath, glabrous except axiliary tufts of hairs, 7 to 10 cm long; petiole about half as long as the blade. Flowers 5 to 10, yellowish-white, fragrant, in small clusters. Fruit ovoid or globose, apiculate, tomentose, thick shelled.

Part used : Blossom (young flowers).

Macroscopical : Flowers in pedunculous cymes, 5 to 10 in number, yellowish-white, fragrant, nector bearing occur in clusters. Peduncle arising half way the leaf-like bract. Flowers with 5 sepals and 5 petals; petals oblanceolate, longer than sepals; originally 5 stamen, each developing into a cluster; style glabrous.

Identification : Evaporate 10 ml of 60 percent alcoholic extract on water bath to remove *alcohol*, extract the residue with 10 ml chloroform, separate the two layers and concentrate the chloroform layer.

(i) Carry out TLC of *chloroform* layer on silica gel 'G' using *chloroform* : *methanol* (9 : 1 v/v) as mobile phase and spray with saturated solution of *artimony trichloride*. Four spots appear at R_f 0.07 (yellow), 0.14 (red), 0.68 (blue) and 0.92 (yellow).

(ii) Using *benzene* : *methanol* (9 : 1 v/v) as mobile phase with same spray regent as in test I, five spots appear at R_f 0.07 (yellow), 0.27 (red), 0.36 (blue), 0.71 (orange) and 0.94 (yellow).

(iii) Carry out TLC of aqueous extract on silica gel 'G' using *n-betanol* : *acetic acid* : *water* (4 : 1 : 1 v/v) as mobile phase and *aluminium chloride solution* as spray reagent. Four spots appear at R_f 0.18 (red), 0.32 (blue), 0.57 (orange) and 0.81 (yellow).

Distribution : Britain, South Europe and U.S.A.

History and authority : Proved by frohlich: *Austria Oest, Zeit. Fur. Hom.,* Vol. IV, 2, 300; Allen: *Encyclop. Mat. Med.,* Vol. X, 1.

Preparation : (a) Mother Tincture ϕ Drug strength1/10

Tilia Europaea in *coarse powder* 100 g

Purified Water	400 ml
Strong Alcohol	635 ml

to make one thousand millilitres of Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four parts Purified Water, Five parts *Strong Alcohol*; 3x and higher with *Dispensing, Alcohol.*

TITANIUM
(Titan.)

Chemical formula : Ti **At. wt.**: 47.90

Description : Dark grey, lustrous metal, hexagonal or cubic crystals, brittle when cold, malleable when hot, ductile when free of oxygen.

Identification : Fuse 0.5 g with 2.5 g of *potassium carbonate* and ignite at 950º for 30 minutes. Cool and extract with 20 ml *dilute sulphuric acid* and filter.

(1) To 5 ml of the filtrate, add few drops of *sodium hydroxide solution;* a white gelatinous precipitate is produced.

(2) To 5 ml of the filtrate, add a piece of *granulated zinc* and allow to stand for sometime; a violet colour is produced.

(3) To 5 ml of the filtrate, add 0.2 ml of *hydrogen peroxide solution;* a yellow to orange-red colour is produced.

Arsenic : Not more than 5 parts per million, H.P.I., Vol. I,

Assay : Dissolve about 0.4 g accurately weighed in 100 ml *dilute hydrochloric acid* and filter. Add 4 g *ammonium thiocyanate* and dilute to 20 ml with *water*. Add *dilute ammonia solution* until the odour persists, then 1 ml *concentrated sulphuric acid* and 4 ml of 10 percent *tannic acid solution.* Dilute to 40 ml, stir thoroughly and cool. Introduce a 20 percent *aqueous solution* of *antipyrine* with constant stirring until an orange-red precipitate is obtained. Stop the stirring and continue the addition of *antipyrine solution,* until a white cheese like precipitate is formed in addition to the red precipitate. Boil the mixture and add 4 g of *ammonium sulphate* and allow to cool with the occasional stirring. Filter and wash the precipitate with 10 ml of 2 percent *sulphuric acid*, 1 g *ammonium sulphate* and 0.1 g *antipyrine.* Dry the precipitate at 100º. Transfer it to a weighed crucible, heat gently at first and then ignite at 700° to 800° to constant weight. Each g is equivalent to 0.6 g of Ti.

History and authority : Proved by Sharp, *Am. Hom. rev.,* Vol. III, 316 (1863); Allen: *Encyclop. Mat. Med.,* Vol. X, 14.

Preparation : (a) Trituration 1x Drug strength1/10

Titanium in *fine powder*	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

TRIFOLIUM PRATENSE
(Tri. prat.)

Botanical name : *Trifolium pratense* Linn. **Family**: Leguminosae (Fabaceae)

Common names : *English*: Red lover; *French*: Trefle; *German*: Ackerklee.

Description : Perennial but of short duration. Stem erect, decumbent or ascending up to 80 cm high, sparsely to densely appressed, pubescent. Stipules oblong, free portion abruptly narrowing into a short awn. Lower leaves long petioled, the upper short petioled to sessile. Flowers sessile or on peduncles, up to 2 mm long; calyx glabrous to sparsely pilose, tube 3 to 4 mm long, lobes setaceous, one 4 to 7 mm long, four 2 to 5 mm long; corolla magenta varying to nearly white; standard obovate-oblong, equaling or slightly exceeding the oblong, obtuse wings.

Part used : Flower.

Identification : (1) Evaporate 20 ml of alcoholic extract on water bath. Extract the residue with *chloroform*. Carryout TLC of *chloroform* extract on silica gel 'G' with *chloroform : ethyl acetate* (90 : 10 v/v) as mobile phase and *antimony trichloride solution* as spray regent; it gives eight spot having R_f value 0.22, 0.28, 0.59, 0.63, 0.75, 0.88, 0.95, 0.98; all spots brown except at R_f 0.75 which is pink.

(2) The residue left after *chloroform* extraction, is extracted with *methanol*. Carry out TLC on silica gel 'G' of the *methanolic* extract, using mobile phase *benzene* : *methanol* (90 : 10 v/v) and 1 percent *ethanolic* solution of *aluminium chloride* as spray reagent; it gives two yellow spots having R_f values 0.13 and 0.24.

Distribution : Great Britain. Introduced into the United States from Europe.

History and authority : Introduced by Duncan: *Trans New York State Hom. Soc.* VIII, 237 in 1870; Allen: *Encyclop. Mat. Med.,* Vol. X, 22.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Trifolium Pratense in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, two parts Purified Water, seven parts. *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

TUSSILAGO PETASITES
(Tuss. pet.)

Botanical name : *Petasites japonicus* F. Schm. **Family**: Compositae (Asteraceae)

Synonym : *Tussilago petasites* Vell.

Common names : *English*: Butter Bur; *French*: Herbe aux tcigenux; *German*: Pestilenwurz

Description : Large perennial herb. Leaves large 1.05 to 1.20 m across, radical; peduncle with 2 or 3 linear bracts, flower heads in a fartigiate thyrse.

Part used : Whole plant.

Identification : Evaporate 40 percent alcoholic extract to remove alcohol. Then extract the remaining part with *chloroform* and separate the two layers.

(1) Carry out TLC of *chloroform* extract on silica gel 'G' using *chloroform : n-butanol* (95 : 5 v/v) as mobile phase; it gives three spots at R_f 0.17, 0.27 and 0.85 under UV light. On spraying with *antimony trichloride solution* one blackish-violet spot appears at R_f 0. 85.

(2) Carry out TLC of aqueous extract on silica gel 'G' using *n-butanol : ethyl acetate : water* (4 : 1 : 1 v/v) as mobile phase and 5 percent *methanolic sulphuric acid* as spray regent. Two spots appear at R_f 0.41 and 0.90 under UV light which turns dark brown on spraying with *methanolic sulphuric acid.*

Distribution : Great Britain.

History and authority : Introduced and proved by Kuchenmeister et al; *A.H.J.*, 32, 131; Allen: *Encyclop. Mat. Med.,* Vol. X, 32; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1471.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Tussilago Petasites in *coarse powder*	100 g
Purified Water	567 ml
Strong Alcohol	470 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part Mother Tincture, four Purified Water, five parts *Strong Water*, five parts *Strong Alcohol*; 3x and higher with D*ispensing Alcohol*.

URANIUM NITRICUM
(Uran. nit.)

Chemical formula : $UO_2(NO_3)_2.6H_2O$ **Mol. wt.**: 502.18

Common name : *English*: Uranium nitrate.

Description : Brilliant yellow crystals with a greenish fluorescence. Freely soluble in water, soluble in *alcohol* and in *ether*. Contains not less than 99.0 percent of $UO_2(NO_3)_2.6H_2O$ with reference to the substance dried to constant weight at 105°.

Identification : (a) Dissolve 0.1 g in 10 ml *water*. Add 3 percent *potassium ferrocyanide solution;* a brown precipitate is produced.

(b) Yields the reactions characteristic of *nitrates*, H.P.I., Vol. I,

Chloride : 10 g complies with the *limit test for chlorides*, H.P.I., Vol. I,

Heavy metals : Not more than 5 parts per million.

Iron : 4 g complies with *limit test for iron*, H.P.I., Vol. I,

Assay : Dissolve about 0.5 g accurately weighed, in 100 ml of *water*. Heat the solution to boiling and add *carbon dioxide-free ammonium hydroxide* until no further precipitation is produced. Filter, wash with a 1 percent *aqueous solution of ammonium nitrate*, then ignite gently with free access of air to constant weight. Weigh the residue and calculate the weight of U_3O_8 using 1.789 as calculation factor.

History and authority : Introduced and proved by Blake; *Hanemann Mat. Med.*, 2, 1871; Allen: *Encyclop. Mat. Med.*, Vol. X, 41; Hering: *Guiding Symptoms*, Vol. X, 357; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1447;

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Uranium Nitricum	100 g
Strong Alcohol in sufficient quantity	

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

(c) Trituration lx — Drug strength 1/10

Uranium Nitricum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Caution : Poison! Not be dispensed below 3x.

Storage : All preparations below 3x to be freshly made.

USNEA BARBATA
(Usnea b.)

Botanical name : *Usnea barbata* Heffm. **Family**: Usneaceae

Synonym : *Usnea dasypoga* (Ach).

Common name : *English*: Bearded usnea.

Description : Filamentous, pendulous, long, crowded, scabrous and tabullous, more or less cylindrical, variously branched, greyish-green or yellowish-green attached at the base by a sheath or by a penetrating holdfast; structure radiate, with a firm chondroid central axis or rarely hollow, the cortical layer thin, of branching swollen hyphae. Apothecia mostly rather large, lateral or terminal peltate, the disc mostly light-coloured with a thalline generally ciliate margin; hypothecium, colourless with underlying gonidia; paraphyses concreate, branched, septate, spores 8, small ellipsoid, simple, spermogones lateral, immersed or slightly branched stigmata and acrogenous spermatia.

Part used : Entire lichen.

Identification : Take 25 ml of the alcoholic extract and evaporate to remove *alcohol*. Dissolve the residue in *chloroform* and extract the *chloroform* layer with 20 ml 5 percent *sodium bicarbonate solution* 3 times and combine the aqueous extract.

(1) Carry out TLC or *chloroform* layer on silica gel 'G' using *cyclothemane* : *ether* (1 : 1) as mobile phase and saturated solution of *antimony trichloride* in *carbon-tetrachloride* as spray reagent. Five spots appears at R_f value 0.31, 0.40, 0.60, 0.70 (yellow) and 0.81 (brown).

(2) The *sodium-bi-carbonate* extract layer is neutralised with 10 percent of *hydrochloric acid*, add slight excess and then extract with *solvent ether*. Carry out TLC or the other layer on silica gel 'G' using *benzene : methanol* (85 : 15) as mobile phase and *2, 4 dinitrophenyl hydrazine* as spray reagent; two spots appear at R_f value 0.51 and 0.60.

(3) Carry out TLC of the ether layer on silica gel 'G' using *benzene: methanol* (9:1) as mobile phase and *bromocresol-green/ bromphenol blue; potassium permanganate* as spray reagent; two yellow spots appear at R_f value 0.10 and 0.20.

Distribution : India and U.K., chiefly on trees in the forests occasionally grown on rocks.

History and authority : Introduced by Anshutz: *New old and forgotten remedies,* 418; Clarke: *A Dictionary of Practical Mat. Med.* Vol. III, 1487.

Preparation : (a) Mother Tincture ϕ — Drug strength 1/10

Usnea Barbata in *coarse powder*	100 g
Purified Water	300 ml
Strong Alcohol	730 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x to contain one part of the Mother Tincture, two part of Purified Water, seven parts of *Strong Alcohol*; 3x and higher with *Dispensing Alcohol*.

YUCCA FILAMENTOSA
(Yuc. fila.)

Botanical name : *Yucca filamentosa* Linn. **Family**: Liliaceae

Common names : *English*: Adam's needle, Bear grass.

Description : Stem short, up to 30 to 50 cm tall. Leaves numerous, stiff, narrowly spathulate, up to 80 cm long, 3 to 7 cm wide, abruptly narrowed or even rounded or concave at the summit and prolonged into a short stout spine, fibrous along the margins, somewhat folded along the midrib, more or less scabrous. Inflorescence paniculate, 1 to 3 m tall, many flowered usually glabrous. Flower white or creamy white; segments of the perianth 5 to 7 cm long and 2 to 3 cm wide, rounded above, short accuminate; style nearly 1 cm long. Capsule thick cylindric, often slightly constricted near the middle, 2 to 4 cm long; seed flat, black about 6 mm long, about 2/3 as wide.

Parts used : Root, leaf and flower.

Identification : Take 10 g, extract with 100 ml of 80 percent *alcohol;* carryout TLC on silica gel 'G' using *chloroform : acetone* (4 : 1 v/v) as mobile phase and 30 percent *chlorosulphonic acid* in *acetic acid* as spray reagent. On heating, four spots appear at R_f 0.16 (bluish-violet) 0.50 and 0.61 (bluish-grey) and 0.83 (light brown).

Distribution : Eastern N. America up to Florida and Louisiana.

History and authority : Introduced and proved by Rowell, *North Amer. Journ. of Hom. New Sery*, VI, 29 in 1875; Allen: *Encyclop. Mat. Med.,* Vol. X, 172; Clarke: *A Dictionary of Practical Mat. Med*., Vol. III, 1579.

Preparations : (a) Mother Tincture ϕ — Drug strength 1/10

Yucca Filamentosa in *coarse powder*	100 g
Purified Water	185 ml
Strong Alcohol	840 ml

to make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2x and higher with *Dispensing Alcohol*.

ZINCUM ACETICUM
(Zinc. ac.)

Chemical formula : $(CH_3COO)_2$ Zn.$2H_2O$ **Mol. wt.**: 219.50

Common names : *English*: Acetate of zinc, *French*: Ace'tate de zinc; *German*: Zinkacetat.

Description : Soft, white, silky plates or monoclinic crystals of a pearly luster; odour faint and acetous; taste sharp, disagreeable and metallic. Soluble in *water* and sparingly soluble in *alcohol*. *C*ontain not less than 99.5 percent $(CH_3COO)_2Zn.2H_2O$ with reference to substance dried at 150°.

Identification : Yields reactions characteristics of *zinc* and *acetates,* H.P.I., Vol. I,

Reaction : A 5 percent solution in *water* is faintly acidic to *litmus*.

Insoluble matter : Take 20 g and dissolve in 150 ml of *water* containing 1 ml of *glacial acetic acid*. The residue does not weigh more than 1.0 mg.

Iron : 0.1 g complies with *limit test for iron,* using 6 drops of *thioglycolic acid,* H.P.I., Vol. I,

Chloride : 1 g complies with the *limit test for chlorides,* H.P.I., Vol. I,

Sulphate : 1 g complies with the *limit test for sulphate,* H.P.I., Vol. I,

Assay : Dissolve about 0.4 g accurately weighed, in 100 ml of *water;* add 5 ml of *ammonium hydroxide, ammonium chloride* and *disodium ethylene diamine tetracetate* until the solution is deep blue in colour. Each ml of 0.05 M *disodium ethylene diamine tetracetate* is equivalent to 0. 01305 g of $(CH_3COO)_2Zn.2H_2O$.

History and authority : Introduced by Franz and proved by Hahnemann; Allen: *Encyclop. Mat. Med.,* Vol. X, 213; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1595.

Preparation : (a) Trituration 1x — Drug strength 1/10

Zincum Aceticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

ZINCUM BROMATUM

(Zinc. br.)

Chemical formula : $ZnBr_2$ **Mol. wt.**: 225.21

Common names : *English*: Zinc bromide; *French*: Bromure de zinc; *German*: Rinkbromid.

Description : White granular, powder; odourless; taste strongly saline and metallic; markedly deliquescent; freely soluble in *water* and in *alcohol.* Contains not less than 97.0 percent of $ZnBr_2$ with reference to the substance dried to constant weight at 105°.

Identification : Dissolve about 1.0 g in 20 ml of *water:*

(i) Gives reactions characteristic of *zinc* and *bromide,* H.P.I., Vol. III,

(ii) To 2 ml of the above solution, add 1 ml of *phosphoric acid* and mix with 0.05 ml of 0.1 percent w/v *solution of copper sulphate* and 2 ml of *solution of mercuric ammonium thiocyanate;* a violet precipitate is produced.

Reaction : Aqueous solution is acidic to litmus.

Assay : Take about 0.3 g accurately weighed, add 10 ml of 1 N *hydrochloric acid,* dissolve, neutralise to litmus with *dilute ammonia solution,* add 3 ml of *dilute hydrochloric acid* and 5 g of *hexamine* and titrate with 0.05 M *sodium edetate* using 0.4 ml of *xylenol orange* as indicator until the colour becomes yellow. Each ml of 0.05 M *sodium edetate* is equivalent to 0. 01126 g of $ZnBr_2$.

History and authority : Proved by Hale; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1597.

Preparation : (a) Tritureation lx — Drug strength 1/10

Zincum Bromatum in *coarse powder*	100 g
Xaccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

ZINCUM MURIATICUM

(Zinc. mur.)

Chemical formula : $ZnCl_2$ **Mol. wt.**: 136.30

Common names : *English:* Zinc chloride; *French*: Chlorure de zinc; *German*: Zinkchlorid.

Description : A white or almost white, deliquescent, caustic, granular powder or opaque, white sticks of masses; soluble in *water*, in *alcohol* and *glycerine;* soluble in *acetone* and *ether*. Contains *zinc* equivalent to not less than 95.0 percent of $ZnCl_2$.

Identification : Yields reactions characteristic of *zinc* and of *chlorides.*

Reaction : 5 percent solution in *water* is acidic to litmus.

Iron : 0.1 g complies with *the limit test for iron,* using 6 drops of *thioglyollic acid.*

Ammonia : Dissolve 1 g in 5 ml of *water;* add 5 ml of *sodium hydroxide solution* and warm; no ammonia is evolved.

Oxychloride : Dissolve about 0.2 g, accurately weighed, in 50 ml *water* and titrate with 0.1 N *hydrochloric acid* using *methyl orange* as indicator; not more than 12.5 ml of 0.1 N *hydrochloric acid* per gramme is required.

Assay : Dissolve about 0.2 g, accurately weighed, in 120 ml of *water*, acidified with 2 to 4 drops of *dilute sulphuric acid,* add 25 ml of *mercuric ammonium thiocyanate solution,* set aside for 5 minutes, stir thoroughly to induce crystallisation and allow to stand for one hour. Transfer to a small suction filter, washing 5 times with quantities, each of 10 ml, of a mixture of 1 volume of *mercuric ammonium thiocyanete solution* and sufficient *water* to produce 50 volumes, so as to transfer the whole of the precipitate to the filter paper in the process. Transfer the filter paper and precipitate completely to a 300 ml stoppered bottle, add 5 ml of *water* and shake well. Add 40 ml of *hydrochloric acid* and 5 ml of *chloroform;* titrate immediately with M/5 *potassium iodate*, shaking vigorously after each addition until the violet colour disappears from the *chloroform* layer. Each ml of M/5 *potassium iodate* is equivalent to 0.004543 g of $ZnCl_2$.

History and authority : Allen: *Encyclop. Mat. Med.,* Vol. X, 215; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1599.

Preparation : (a) Trituration 1x — Drug strength 1/10

Zincum Muriaticum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

ZINCUM OXYDATUM
(Zinc. ox.)

Chemical formula : ZnO **Mol. wt.**: 81.32

Common names : *English*: Zinc oxide; *French*: Oxydo do zinc; *German*: Zinkoxyd.

Description : A soft, white or faintly yellowish-white powder, free from grittiness. It gradually absorbs carbon dioxide from air. Insoluble in *water,* in *alcohol;* soluble in solution of *alkali hydroxides* and in dilute mineral acid. Odourless; tasteless. It contains not less than 99.0 percent of ZnO calculated with reference to the substance dried to constant weight at 105º.

Identification : (i) When strongly heated it assumes a yellow colour which disappears on cooling.

(ii) A solution in *dilute hydrocholic acid,* after neutralisation of the excess acid, yields the *reactions* characteristic of *zinc*.

Reaction : Mix 1 g with 10 ml of hot *water* and add two drops of *solution of phenolphthalein* if a red colour is produced, not more than 0.3 ml of 0.1 N *hydrochloric acid* required to discharge it.

Carbonate and insoluble matters : Mix 2 g with 10 ml of water, add 30 ml of *dilute sulphuric acid* and heat on water bath with constant stirring; no effervescence occurs and the resulting solution is clear and colourless.

Iron : Dissolve 0.1 g in a mixture of 5 ml of *water* and 0.5 ml of *iron free hydrochloric acid* and dilute to 40 ml with *water;* the solution complies with the *limit test for iron,* using 6 drops of *thioglycollic acid*.

Lead : Dissolve 2 g in mixture of 20 ml of *water* and 5 ml of *glacial acetic acid* and add 5 drops of solution of *potassium chromate; the* solution remains clear, H.P.I., Vol. I,

Metallic zinc : Dissolve 2 g in a mixture of 30 ml of *dilute hydrochloric acid* and 10 ml of *water* to which has been added 1 drop *solution of lead acelate;* the solution is clear and colourless.

Loss on drying : Loses not more than 1 percent of its weight when ignited to constant weight.

Assay : Weigh accurately about 1.5 g and dissolve in 50 ml of 1 N *sulphuric acid* containing 2.5 g of *ammonium chloride*. Titrate the excess of acid with 1 N *sodium hydroxide* using *methyl orange* as indicator. Each ml of 1 N *sulphuric acid* is equivalent to 0.04069 g of ZnO.

History and authority : Proved by Wernek, Buichner and Michaelis; Clarke: *A Dictionary of Practical Mat. Med.*, Vol. III, 1601.

Preparation : (a) Trituration 1x — Drug strength 1/10

Zincum Oxydatum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

Storage : Preparations below 3x to be kept in well-closed containers.

ZINCUM PHOSPHORATUM

(Zinc. phos.)

Chemical formula : Zn_3P_2 **Mol. wt.**: 258. 10

Common names : *English*: Phosphide of Zinc; *French*: Phosphure de zinc; *German*: Phosphorzink.

Description : A dark grey or steel-grey crystalline substance; odour characteristic when moist it releases, phosphine, odour, garilic-like repulsive. Soluble in *benzene* and *carbon disulphide.* Insoluble in *water* and *alcohol*, decomposed by mineral acids with violent reaction with evolution of phosphine. Contains not less than 95.0 percent of Zn_3P_2 with reference to the substance dried to constant weight at 105°.

Identification : (a) Acidic solution gives reaction characteristic of *zinc*, H.P.I., Vol. I, and *phosphides*, H.P.I., Vol. I,

(b) 1.0 g of the finely powdered substance, when treated with an *aqueous solution of ammonium chloride* and kept overnight, should weigh not less than 0.9 g after washing successively with *water, alcohol, ether* and drying.

Arsenic : Not more than 10 parts per million, H.P.I., Vol. I,

Iron : Dissolve 0.1 g in 10 ml *dilute nitric acid* and 0.5 ml *iron free-hydrochloric acid* and dilute to 40 ml with *water*, complies with *limit test for iron* using 6 drops of *thioglycollic acid.*

Metallic zinc : Dissolve 0.1 g in a mixture of 30 ml *dilute nitric acid,* 10 ml of *dilute hydrochloric acid* to which has been added one drop of *solution of lead acetate;* the solution is clear and colourless.

Assay : Weigh accurately about 10 g, suspend in 75 ml *water*, add cautiously *conc. nitric acid;* a violent reaction ensures, cool, keep on adding *conc. nitric acid* drop wise, until the reaction is complete. Cool the mixture, add a drop of *phenolphthalein* and add a *dilute ammonium hyaroxide solution* till the precipitation is complete. Collect it on a sintered glass crucible, wash with *water* and dry at 105º. Weigh as Zn_3PO_4. Each g of precipitate is equivalent to 0.6649 g of Zn_3P_2.

History and authority : Introduced by Thompson, *Practitioner,* 1873 (2) 271; Allen: *Encyclop. Mat. Med*., Vol. X, 221.

Preparation : (a) Trituration 1x Drug strength 1/10

Zinc Phosphoratum	100 g
Saccharum Lacits	900 g

to make on thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with the method, H.P.I., Vol. I, 6x be converted to liquid 8x, H.P.I., Vol. I,

Caution : Poison! Not to be dispensed below 3x .

Storage : All preparations below 6x to be kept in well-closed container protected from light.

ZINCUM VALERIANICUM

(Zinc. val.)

Chemical formula : $Zn(C_5H_9O_2)_2$ **Mol. wt.**: 267.62

Common names : *English*: Valerianate of zinc; *French*: Valerianate dezinc; *German*: Zinc vaelerianat.

Description : Anhydrous, white lamellar crystals, soft to tough, having a metallic taste and an odour of valerianic acid; loses valerianic acid on exposure to air. Soluble in *alcohol* and sparingly soluble in *water.* Generally prepared from the *sodium valeriant* and *zinc sulphate*.

Identification : (1) Take 0.5 g and add 3 ml of *water* and 1 ml of *hydrochloric acid; valerianic acid* is liberated and appears as oily drops upon the surface of the liquid.

(2) Take 0.5 g and heat, moist the residue with *cobalt chloride solution* and heat to redness; the residue becomes green.

Reaction : Its aqueous solution is acidic to *phenol red.*

Residue on Ignition : To 1 g, add a small quantity of *nitric acid,* dry at a gentle heat and then heat to redness; the residue should not be less than 0.29 g.

Assay : Take about 0.1 g accurately weighed and dissolve in minimum quantity of *alcohol* and acidify it with 2 to 5 ml of *acetic acid* to pH, 3 to 4 to be determined by pH paper. Heat to boiling and add 3 percent *sodium quinaldate solution* with stirring until precipitation is complete. Allow to cool to room temperature. Wash the precipitate by decantation with cold *water,* collect it on a sintered glass crucible. Wash with a little *alcohol* and dry. Each g of residue is equivalent to 0.6258 g of $Zn(C_5H_9O_2)_2$.

History and authority : Introduced and proved by Finney; Clarke: *A Dictionary of Practical Mat. Med.,* Vol. III, 1607.

Preparation : (a) Trituration 1x — Drug strength 1/10

Zincum Valerianicum	100 g
Saccharum Lactis	900 g

to make one thousand grammes of the trituration.

(b) Potencies: 2x and higher to be triturated in accordance with method H.P.I., Vol. I, 6x may be converted to liquid 8x, H.P.I., Vol. I,

APPENDICES

APPENDIX—I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Acetic acid : Of the H.P.I., Vol. I

Acetone : Of the H.P.I., Vol. III

Alcohol : Of the H.P.I., Vol. II

Alum, Solution of : A 5.0 percent w/v solution of alum in *water*.

Aluminium chloride : Of the H.P.I., Vol. IV

Amaranth, solution of : Of the H.P.I., Vol. I

Ammonia/Ammonium Chloride Buffer : Of the H.P.I., Vol. III

Ammonia, Carbon-dioxide free : Ammonia which is protected from atmosphere during cooling and storage.

Ammonia solution, Dilute : Of the H.P.I., Vol. I

Ammonium acetate : Of the H.P.I., Vol. I

Ammonium chloride, solution of : Of the H.P.I., Vol. I

Ammonium molybdate : Of the H.P.I., Vol. I.

Ammonium molybdate, 5 percent solution of : Of the H.P.I., Vol. I

Ammonium oxalate, solution of : Of the H.P.I., Vol. I

Ammonium persulphate : Of the H.P.I., Vol. III

Ammonium sulphate : Of the H.P.I., Vol. IV

Ammonium thiocyanate : Of the H.P.I., Vol. I.

Ammonium validate : NH_4VO_3 : Should contain not less than 98.0 percent of NH_4VO_3.

Description : A white crystalline powder.
Assay : Dissolve 0.5 g in 30 ml of *water* in 1 ml of *sulphuric acid* and pass *sulphur dioxide* into the solution, until reduction is complete. Remove the excess of sulphur-dioxide by boiling

gently in a current of carbon-dioxide, cool and titrate with 0.1 N *potassium permanganate*. Each ml is equivalent to 0.0117 g of NH_3VO_3.

Aniline : Of the H.P.I., Vol. IV

Aniline phthalate : Of the H.P.I., Vol. IV

Antimony trichloride : Of the H.P.I., Vol. III

Arsenious acid solution of : Arsenic chloride solution prepared with 1 g arsenious trioxide, 5 ml *dilute hydrochloric acid* and *water* 100 ml.

Ascorbic Acid : Of the H.P.I., Vol. III

Barium Chloride, solution of : Of the H.P.I., Vol. I

Benzene : Of the H.P.I., Vol. III

Benzidine : $NH_2(C_6N_4)_2NH_2$.
Description : A pale buff coloured crystalline powder.
Solubility : Readily soluble in *alcohol* (90 percent) yielding a clear solution; 1 g dissolves in a mixture of 3 ml of *dilute hydrochloric acid* and 25 ml of *water*, yielding a clear solution.
Melting range : 128° to 129°.
Organic impurities : Dissolve 0.1 g in 5 ml of *glacial acetic acid*, the solution is clear and not more than faintly coloured; add 6 ml of a mixture of equal volumes of *solution of hydrogen peroxide* and *water;* no darkening is produced.

Bromine water : Of the H.P.I., Vol. I

Brucine : Of the H.P.I., Vol. I

Butanol : Of the H.P.I., Vol. IV

Calcium hydroxide, Aqueous solution of : Approximately 0.15 percent w/v solution of calcium hydroxide in *water*.

Calamol : Of the H.P.I., Vol. I

Carbon disulphide : Of the H.P.I., Vol. I

Chloroform : Of the H.P.I., Vol. IV

Chlorosulphuric acid : $ClSO_3H$
Description : A colourless, corrosive and fumingless.
Boiling point : about 151°

Wt. per ml : about 1.76 g

Cobalt chloride : Of the H.P.I., Vol. III

Copper : Of the H.P.I., Vol. I

Copper sulphate, solution of : Of the H.P.I., Vol. IV

Cyclohexane : C_6H_{12}
Description : A clear colourless liquid.
Boiling range : 81° to 82°.
Wt. per ml : 0.78 g

Diethylamine : $(C_2H_5)NH_2$
Description : A volatile, colourless liquid with an ammoniacal odour.
Boiling range : 55° to 56°.
Wt. per ml : 0.70 g.

Dimethyl glyoxime : A solution of *dimethyl glyoxime.*

Dimethyl glyoxime Alcoholic, solution of : A solution of *dimethyl glyoxime* in *alcohol.*
Containing 5.0 percent w/v of $CH_3C(N.OH).C(N.OH).CH_3$.

m-Dinitro benzene : $C_6H_4(NO_2)_2$
Description : Pale yellow, needle like crystals.
Solubility : Insoluble in water; soluble in *alcohol*.
Melting range : 89° to 90°.
Sulphated ash : Not more than 0.1 percent.

Diphenyl carbozide : $(C_6H_5.NH.NH)_2Co$
Description : A white, crystalline powder which gradually acquires a pink tint on exposure to air.
Solubility : Insoluble in *water;* soluble in *alcohol.*
Melting rang : 165° to 169°.
Sulphated ash : Not more than 0.1 percent.

Dithizone : C_6HN_5 : $N.C_5S.\ NH.NH.C_6H_5$
Description : An almost black powder.
Solubility : Insoluble in *water;* sparingly soluble in *alcohol,* freely soluble in *carbon tetrachloride* and chloroform.

Ether : Of the H.P.I., Vol. IV

Ethyl acetate : Of the H.P.I., Vol. IV

Ethyl ether : Of the H.P.I., Vol. IV

Ferric ammonium sulphate : Of the H.P.I., Vol. I

Ferric chloride, solution of : Of the H.P.I., Vol. I

Ferrous sulphate, solution of : Of the H.P.I., Vol. III

Ferric acid : Of the H.P.I., Vol. IV

Glycerine : Of the H.P.I., Vol. III

Hexamine : $C_6H_{12}N_4$

Should contain not less than 99.0 percent of $C_6H_{12}N_4$.

Description : Colourless, lustrous crystals or a white, crystalline powder, odourless, taste at first sweetish but afterwards bitter. Sublimes at about 260° without melting and with partial decomposition and evolution of a disagreeable odour. Burns readily with a blue smokeless flame.

Solubility : Soluble in *water* and *alcohol*.

Identification : (1) Mix 0.1 g with an equal weight of *salicylic acid* and heat with 1 ml of *sulphuric acid*; a carmine red colour is produced.

(2) Heat solution with *dilute sulphuric acid* decomposition takes place and formaldehyde is produced. Add excess of solution of *sodium hydroxide;* ammonia is evolved.

Reaction : A 10.0 percent w/v solution is alkaline to *solution of litmus*.

Assay : Weigh accurately 1.5 g and dissolve in 10 ml of *water* add 50 ml of 1 N *sulphuric acid* and boil gently until the odour of formaldehyde has disappeared, replace it from time to time the water lost by evaporation. Titrate the excess of sulphuric acid with 1 N *Sodium hydroxide* using solution of *methyl red* as indicator. Each ml of 1 N sulphuric acid is equivalent to 0.03505 g of $C_6H_{12}N_4$.

Hydrochloric acid, Iron free : Hydrochloric acid which contains 35.0 percent w/w of HCl and complies with the following additional test :-

Iron : Evaporate 8.5 ml of the acid in porcelain or glass disc almost to dryness. Take up the residue in 2 ml of the acid and dilute to 50 ml. Add about 30 mg of *ammonium persulphate*

and 3 ml of *ammonium thiocyanate* and mix. Any red colour produced is not darker than that of a control made with 0.01 mg of Fe, 2 ml of sample and the same quantities of *ammonium persulphate* and *ammonium thiocyanate* as with the sample.

Hydrogen peroxide, solution of : Of the H.P.I., Vol. III

Hydroquinone, Aqueous solution of : A solution of Hydroquinone in *water* containing 5.0 percent w/v of $C_6H_4(CH)_2$.

Iodoplatinate : Of the H.P.I., Vol. IV

Lead Acetate : Of the H.P.I., Vol. IV

Lead Acetate, solution of : Of the H.P.I., Vol. I

Lead dioxide : PbO_2

Description : A dark brown powder. Chloride, bromide and iodide – Warm 2 mg with 50 ml of *water* and 2 ml of *nitric acid*, cool, filter and add to the filtrate 1 ml of *solution of silver nitrate*; any opalescence produced is not greater than the standard opalescence obtained in the unit test of chlorides.

Magnesium acetate, Methanolic solution of : Of the H.P.I., Vol. III

Magnesium oxide : MgO
Description : A white powder; odourless taste, slightly alkaline. Readily absorbs moisture and carbondioxide when exposed to air.
Solubility : Almost insoluble in *water* and in *alcohol*. Soluble in dilute acids.

Mercuric ammonium thiocyanate, solution of : Dissolve 30 g of ammonium thiocyanate and 27 g of mercuric chloride in sufficient water to produce 1000 ml.

Mercuric Iodide : Of the H.P.I., Vol. I

Mercuric nitrate, solution of : Of the H.P.I., Vol. IV

Methanol : Of the H.P.I., Vol. IV

Methyl ethyl ketone : $CH_3CO\ C_2H_5$

Contains not less than 88.0 percent of C_4H_8O
Description : A colourless, flammable liquid with a characteristic odour.
Solubility : Miscible with *water*, *alcohol*, *ether* and *benzene*.
Boiling point : About 79° to 80°.
Wt. per ml : 0.81 g

B—Naphthol : Of the H.P.I., Vol. III

Ninhydrin : $C_9H_4O_3 . H_2O$
Description : A very pale yellow, crystalline powder.
Melting range : 254° to 256°.

Ninhydrin, solution of : A 0.2 percent w/v solution of *ninhydrin* in a mixture of 95 volumes *butanol* and 5 volumes of 2 M *acetic acid*.

Nitric acid : Of the H.P.I., Vol. I

Nitric acid, dilute : Of the H.P.I., Vol. I

Nitric acid, fuming : Of the H.P.I., Vol. III

Nitrobenzene : $C_6H_5NO_2$
Description : A pale yellow liquid; odour characteristic.

Potassium nickel cyanide : It can be prepared by dissolving 5 g of *nickel sulphate* in *distilled water* and adding portionwise 5 g of *potassium cyanide*. A yellow solution is formed and a white precipitate of potassium sulphate separates; add *menhanol* and filter off the precipitated potassium sulphate. Concentrate the filtrate at 70° and collect the crystals of potassium nickel cyanide.

Potassium nitrate : Of the H.P.I., Vol. III

Potassium permanganate : Of the H.P.I., Vol. IV

Potassium permanganate, solution of : Of the H.P.I., Vol. III

Potassium permanganate, acidic : Of the H.P.I., Vol. III

Potassium sodium tartarate : Of the H.P.I., Vol. III

Resorcinol : Of the H.P.I., Vol. IV

Silver nitrate, solution of : Of the H.P.I., Vol. I

Sodium acetate : Of the H.P.I., Vol. III

Sodium bicarbonate : Of the H.P.I., Vol. IV

Sodium carbonate, solution of : Of the H.P.I., Vol. I

Sodium carbonate-Anhydrous : Of the H.P.I., Vol. IV

Sodium chloride : Of the H.P.I., Vol. I

Sodium hydroxide, solution of : Of the H.P.I., Vol. III

Sodium nitrate : Of the H.P.I., Vol. II

Sodium periodate : $NaIO_4$
Description : white crystals or a white Crystalline powder.
Solubility : soluble in *water.*
Assay : Dissolve about 0.5 g accurately weighed, in 100 ml of *water*. Add 3 g of *sodium bicarbonate* and 3 g *potassium iodide* and titrate the liberated *iodine* with 0.1 N *sodium arsenite;* each ml of *sodium arsenite* is equivalent to 0.02139 g of sodium periodate.
Solubility : Insoluble in *water*; freely soluble in *alcohol, benzene* and *ether.*
Boiling range : Not less than 95.0 percent distils between 210° to 212°.

Petroleum ether (light) : Of the H.P.I., Vol. III

Phenazone : $C_{11}H_{12}ON_2$
Contains not less than 98.0 percent of $C_{11}H_{12}ON_2$.
Description : A white, crystalline powder.
Melting range : 111° to 123°.
Sulphated ash : Not more than 0.1 percent.
Assay : Weigh accurately about 0.2 g and dissolve in 20 ml of a 100 percent w/v *solution of sodium acetate* add 30 ml of 0.1 N *iodine* and allow to stand for twenty minutes with occasional shaking. Add 10 ml of *chloroform,* shake until precipitate is dissolved and titrate the excess of iodine with 0.1 N *sodium thiosulphate,* using *starch* as indicator. Each ml of 0.1 N iodine is equivalent to 0.009412 g of $C_{11}H_{12}ON_2$.

Phloroglucinnol : $C_6H(CH)_3.2H_2C$
Description : White or light brown crystals or a crystalline powder.

Solubility : Slightly soluble in *water*, soluble in *alcohol* and in *solvent ether*.
Melting range : 215° to 219°.
Sulphated ash : Not more than 0.1 percent to be kept protected from light.

Phosphomolybdic acid : $H_3PO_4.12MoO_3.24\ H_2O$
Description : Deep yellow crystals.
Solubility : Very soluble in *water*. A 10 percent w/v solution in *water* is clear.
Ammonia : Boil 0.5 g with 20 ml of a 5 percent w/v *solution of sodium hydroxide*. Vapour evolved does not change the colour of moistured red litmus paper.

Phosphoric acid : Of the H.P.I., Vol. I

Phosphorous pentoxide : P_2O_5
Description : A white amorphous very deliquescent powder.
Solubility : Soluble in *water* with evolution of heat from phosphoric acid.

Reducing substances : Dissolve 1 g in 50 ml of *water*, add 0.5 ml of 0.1 N *potassium permanganate* and heat for five minutes on a steam bath; the pink colour is not completely discharged.

Potassium bicarbonate : $KHCO_3$
Contains not less than 99.0 percent of $KHCO_3$.
Description : Colourless, transparent, monoclinic prisms or a white granular powder; odourless; taste, saline and feebly alkaline.
Solubility : Soluble in *water* practically, insoluble in *alcohol*.
Reaction : pH of a 1.0 percent w/v solution is not greater than 8.6.

Potassium Carbonate : Of the H.P.I., Vol. I

Potassium chromate : Of the H.P.I., Vol. I

Potassium cupritartrate, solution of : Of the H.P.I., Vol. I

Potassium dichromate : Of the H.P.I., Vol. I

Potassium hydroxide, alcoholic solution of : A solution of *potassium hydroxide* in *alcohol* containing 10.0 percent w/v of KOH.

Potassium iodide, solution of : Of the H.P.I., Vol. I

Potassium mercuric iodide, solution of : Of the H.P.I., Vol. III

Sodium sulphide : Of the H.P.I., Vol. I

Sodium thiosulphate, solution of : Of the H.P.I., Vol. II

Stannous chloride, solution of : Of the H.P.I., Vol. I

Starch : Of the H.P.I., Vol. IV

Mucilage starch : Of the H.P.I., Vol. IV

Sulphuric acid : $H_2N.C_6H_4.SO_3H$
Contains not less than 99.0 percent of $C_6H_7O_3NS$.
Description : White or nearly white crystals or powder.
Solubility : Soluble in 33 parts of hot water, giving a clear and colourless solution, which deposits crystals on cooling.
Sulphated ash—Not more than 0.1 percent.
Assay : Suspend about 5 g, accurately weighed, in 100 ml of water and titrate with 1 N *sodium hydroxide* using *solution of phenolphthalein* as indicator. Each ml of 1 N sodium hydroxide is equivalent to 0.1732 g of $C_6H_7O_3NS$.

Sulphuric acid, concentrated : Of the H.P.I., Vol. I

Sulphuric acid, dilute : Of the H.P.I., Vol. IV

Sulphuric acid, Methanolic : Of the H.P.I., Vol. IV

Tannic acid, solution of : Of the H.P.I., Vol. III

Thioglycollic acid : Of the H.P.I., Vol. I

Water-carbon dioxide free : Of the H.P.I., Vol. I

Zinc, granulated : Of the H.P.I., Vol. I

Zinc, fillings : Of the H.P.I., Vol. I

APPENDIX—II

SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Acetic acid 7 M : Of the H.P.I., Vol. IV

Ammonium thiocyanate, 0.1 N : Of the H.P.I., Vol. IV

Disodium edentate .05 M : Of the H.P.I., Vol. IV

Ethylene diamine tetra Acetate, .01 M : *Ethylene diamine 'tetra acetate'* dissolved in water to contain in 1,000 ml of the following quantity of EDTA.

For 0.01 M	2.92 g EDTA

Hydrochloric acid, 0.1M, 0.05 M : Of the H.P.I., Vol. IV

Iodine, 0.1 N : Of the H.P.I., Vol. IV

Magnesium sulphate, 0.1 M, 0.05 M : Magnesium sulphate dissolved in *water* to contain in 1000 ml the following quantity of $MgSO_4$.

For 0.1 M	24.648 g $MgSO_4$
For 0.05 M	of the H.P.I. Vol. III

Perchloric acid 0.1 N : Cool 750 ml of *glacial acetic acid* to about 15° and add slowly, with continuous stirring, 11 ml of *perchloric acid* (60 percent w/w) adding 1 ml at a time so that the temperature does not rise. Cool the mixture to temperature not lower than 10° but without freezing it and add an amount of *acetic anhydride* calculated to react with the *water* in *perchloric acid*. This addition is made dropwise from a burette, the temperature being controlled so that it does not rise to more than 0.5°. Allow the temperature to rise to 15° and add, stirring sufficient *glacial acetic acid* to produce 1000 ml at 20°. Ascertain its exact strength by titrating it with 150 ml 0.1 N *sodium acetate* using 1 ml of *solution of Naphthol-benzene* as indicator. Each ml of 0.1 N sodium acetate is equivalent to 0.010047 g of perchloric acid.

Potassium Iodate, 0.05 M : Of the H.P.I., Vol. IV

Silver Nitrate, 0.1 M : Of the H.P.I., Vol. IV

Sodium Hydroxide, 0.1 N, 1N : Of the H.P.I., Vol. IV

Sodium nitrate, 0.1 M : *Sodium nitrate* dissolved in *water* to contain in 1000 ml of following quantity of $NaNO_2$.

Sodium Thiosulphate, 0.1 N : Of the H.P.I., Vol. IV

Sulphuric Acid, 0.1 N : Of the H.P.I., Vol. IV

Zinc chloride, .05 M : Dissolve 3.269 g of *granulated zinc* in the minimum amount of 2 N *hydrochloric acid* and add sufficient *water* to produce 1000 ml.

APPENDIX—III

INDICATORS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Bromocresol green : Of the H.P.I., Vol. I

Bromophenol blue : Of the H.P.I., Vol. I

Bromothymol blue : Of the H.P.I., Vol. I

Eriochrome black T : Sodium 1 : (1–Hydroxy – 2–Naphthylazo) –5–nit–2–naphthol–3–sulphonate.

Eriochrome black T, solution of : Dissolve 0.2 g of Eriochrome black T and 2 g of *hydroxylamine hydrochloride* in *methyl alcohol* to produce 50 ml.

Methyl orange : Of the H.P.I., Vol. I

Methyl red : Of the H.P.I., Vol. I

Mordant black : Of the H.P.I., Vol. III

Rhodamine-b : Of the H.P.I., Vol. III

Thymol blue : Of the H.P.I., Vol. III

Xylenol orange, solution of : Shake 0.1 g of *xylenol orange* with 100 ml of *water* and filter if necessary.

APPENDIX—XIV

STANDARDS FOR VEHICLES USED FOR INTERNAL MEDICATION

1. Lactose : Saccharum Lactis : H.P.I., Vol. I

2. Sucrose : Description : Colourless crystals or crystalline masses or a white powder; odourless; taste sweet.

Solubility : Soluble in 0.5 ml of *water* and in 170 parts in *alcohol*. It is insoluble in *chloroform* and in *solvent ether*.

Identification : (i) when heated, it melts, swells up and burns, giving off an odour of burnt sugar and leaving a bulky carbonaceous residue.

(ii) Hydrolyse a 5 percent solution in water by boiling with 0.1N sulphuric acid and neutralize with a solution of 0.1 percent sodium hydroxide. Add a potassium cupritartarate solution and heat; a copious red precipitate is produced.

Reaction : A 10 percent w/v solution is neutral to litmus.

Reducing sugars : Dissolve 10 g in 20 ml of water and heat to 80° with 5 ml of potassium cupri-tartarate solution; not more than a trace of red or yellow precipitate is produced.

Ultramarine : Dissolve 10 g in 20 ml of hot water; a clear, colourless and odourless solution is formed which on the subsequent addition of 1 ml of dilute hypophophorous acid, does not develop an unpleasant odour in one hour.

Sulphated ash : not more than 0.02 percent; H.P.I., Vol. I

Tablets : Hand made and compressed tablets :

(1) Drug content : It should contain the claimed medicine determined by known assay methods for the concentration manually or by using a suitable instrument. Permitted variation ± 5 percent.

(2) Lactose content : Not less than 94 percent approximate by TLC using *n-butanol* : *acetic acid* : *water* (4 : 1 : 1 v/v) *as mobile phase and* aniline phthalate as spray reagent. Exception can be, where the tablets should contain not less than 84 percent *lactose*.

(3) Binder : Not exceeding 3 percent w/w.

(4) Lubricants : Not exceeding 3.0 percent w/w.

(5) Insoluble matters : Not exceeding 5.0 percent w/w.

(6) Absence of sucrose : Absence of corresponding spot, when TLC is done under same condition as given in the *lactose* content.

(7) Absence of starch : To be determined by negative *starch-iodine test*.

(8) Talc : Should give negative *test for magnesium silicate*.

(9) Chalk : Should give negative tests for *carbonates* and *calcium* except in calcarea group of drugs where the calcium content should be proportionate/matching to be claimed, calcium as drug.

(10) Kaolin : Should give *negative tests for aluminium*.

(11) Dissintegration/Dissolution time : Compressed tablets should pass the tests for disintegration time within five minutes.

(12) Ash value : Handmade tablets (TT)—not exceeding 0.1 percent w/w.
Compressed tablets—not exceeding 0.5 percent w/w.

(13) Weight variation : Weigh 20 tablets and find out average weight. When weighed singly, not more than two of the tablets should deviate from the average weight by 10 percent.

(14) Disintegration/Dissolution : Unless otherwise stated the tablets should comply with disintegration tests.

Disintegration test :

Apparatus : A glass or suitable plastic tube 80—100—mm long, with an internal diameter of about 28 mm and an external diameter of 30 to 31 mm fitted at the lower end with a disc of rust proof wire gauze complying with the requirements for a No. 10 sieve, is suspended in a volume of *water*, having a depth not less than 15cm and at a temperature between 35° and 39°, in such a way that it can be raised and lowered repeatedly in a uniform manner through a distance of 75mm; at the highest position of the tube, the gauze just breaks the surface of the

water and at the lowest position. The upper rim of the tube remains clear of the *water*. The tube may be manipulated by hand or mechanically.

Guided disc : This consists of a disc of a suitable plastic material, about 26 mm in diameter and 2 mm thick; the lower surface is flat and the upper surface has three holes equally spaced and 10mm from the center. In each hole stainless steel wire of no. 22 standard wire gauze is secured at a right angle to the plane of the disc and at the end of each wire is turned out radically and secured to a guide ring 27 mm in diameter, made of similar material. The guide ring is coaxial with the disc from a parallel plane at distance of 15 mm from the upper surface of the disc. The difference between diameter of the disc and the internal diameter of the tube is not more than 2 mm. The total weight of the guided disc is not less than 1.0 g and not more than 2.1 g.

Method : Place five tablets in the tube. Insert the guided disc above the tablets, in the tube and raise the lower tube in such a manner that the complete up and down movement is repeated thirty times a minute. The tablets are disintegrated when no particles remains above the gauze which will not readily pass through it. The time required for five tablets to disintegrate in the manner prescribed for tablets, unless otherwise stated in the monograph, not more than fifteen minutes.

Whenever the medicated tablets are concerned, they should in addition to stated quantity of drug respond favourably to the standard prescribed for tablets.

Globules : (1) The contents of globules should be mentioned on the label.

(2) Globules are prepared from pure *cane sugar* (pharmaceutical grade of cane sugar/sucrose). It is sometimes made with 80 percent sucrose and 20 percent *lactose*. They must be white, of uniform size for the claimed size normally designated as numbers (10, 15, 20, 25, 30, 40, 50, 80).

(3) The claimed size is determined as follows :
Lay ten close contact with each other, the space so occupied is measured in millimeters by a suitable caliper and the measure is designated as numbers. Permitted variation ± 10%.

(4) The globules should be perfectly globular; the diagonal diameters measured with the help of screw gauge, shall not vary more than 10 percent between them.

(5) Hardness : Globules should not be too soft or too hard.

(6) Solubility : Entirely soluble in *water*.

(7) Sugar contents : Not less than 99 percent of the claimed amount.

(8) Foreign matters : Globules should not contain any of the following substances :

(a) Flavour (b) Starch (c) Glucose (d) Glycerine (e) Talc (f) Chalk (g) Kaolin (h) Antioxidants (i) Inorganic and synthetic whitening agents.

(9) Porosity : Should be capable of impregnation as evidenced by capacity to absorb 0.1 percent, *methylene blue solution* to the center of the sphere, within 30 seconds (cut by a blade to observe).

APPENDIX—XXIV

Till such time the Rf of individual drug is prescribed all mother tinctures should pass Co-TLC with the reported main constituents subject to the condition that they are not less than 1 per w/w in raw material.

Co-TLC with tincture made from authenticated raw material is also permitted.

APPENDIX—XXV

(A) *Standard for simple ointment* :

Wool fat	50 g	melt together and stir until cold.
Hard paraffin	50 g	
White soft paraffin	850 g	
Cetostearyl alcohol	50 g	

Unless otherwise directed in the text, simple ointment prepared with *white soft paraffin* should be used in a white ointment.

(B) *Standard for eye ointment* :

Eye ointment should contain the following composition :

Liquid paraffin	10 g
Wool fat	10 g
Yellow soft paraffin	80 g

Heat together the wool fat, the yellow soft paraffin and the *liquid paraffin*, filter while hot through a coarse filter paper placed in a heated funnel and sterlise by heating for a sufficient time to ensure that the entire matter is at 160° for at least one hour. Allow to cool, add the drug and triturate the mixture.

Note : All eye ointment and other ophthalmic preparations should confirm to the schedule FF of Drugs and Cosmetics Rules.

(C) *Cream Based Ointment* :

Cream based ointments are permitted subject to following conditions :-

1. They should be hydrophilic or emulsion based ointment.
2. Ingredients used are of Pharmacopoeial grade and are free from allergic abnormal toxicity.
3. Ingredients of base material should be non-reactive to the medicinal substances included in the formation.
4. It should contain a minimum quantity of preservatives.

(D) *Paraffin ointment* :

White Bee wax	20 g
Hard Paraffin	30 g
Cetestearyl Alcohol	50 g
White soft paraffin	900 g

Melt together, stir, remove the source of heat and continue, stirring until the mass reaches room temperature.

When Paraffin Ointment is used in a white ointment, it should be prepared with *white soft paraffin*. All these ointments should be homogeneous. In event of medicated ointments the contents should be exhibited indicating the pharmacopoeial name, potencies and percentage.

APPENDIX—XXVI

Standards for Syrup :

Sucrose	667 g
Purified water, sufficient to produce	1000 ml

Add sucrose to *purified water* and heat with occasional stirring until dissolve. Add sufficient boiling Purified Water to produce 1000 ml.

Wt. per ml : At 20°, 1.315 g to 1.327 g.

Note : Parabens in a concentration not higher than 0.15 percent may be used as a preservative.

APPENDIX—XXVII

Temperature Correction Data

Observed temp. in 0°C to 20°C	Observed alcohol % at 20°C	Corresponding alcohol % at 15°C
	1.00	0.75
	2.00	1.50
	3.00	2.40
	4.00	3.40
	5.00	4.40
	6.00	5.40
	7.00	6.40
	8.00	7.30
	9.00	8.20
	10.00	9.30
	11.00	10.30
	12.00	11.20
	13.00	12.20
	14.00	13.10
	15.00	14.00
	16.00	14.90
	17.00	15.80
	18.00	16.70
	19.00	17.60
	20.00	18.50
	21.00	19.50
	22.00	20.50
	23.00	21.40
	24.00	22.40
	25.00	23.30
	26.00	24.30
	27.00	25.20
	28.00	26.10
	29.00	27.00
	30.00	27.90
	31.00	28.90
	32.00	29.90
	33.00	30.80
	34.00	31.80
	35.00	32.80
	36.00	33.80
	37.00	34.80
	38.00	35.80
	39.00	36.80

40.00	37.80
41.00	38.90
42.00	39.90
43.00	40.90
44.00	42.00
45.00	43.00
46.00	44.00
47.00	45.00
48.00	46.00
49.00	47.00
50.00	48.00
51.00	49.00
52.00	50.00
53.00	51.00
54.00	52.00
55.00	53.00
56.00	54.00
57.00	55.00
58.00	56.00
59.00	57.00
60.00	58.00
61.00	59.00
62.00	60.00
63.00	61.00
64.00	62.00
65.00	63.00
66.00	64.00
67.00	65.10
68.00	66.10
69.00	67.10
70.00	68.10
71.00	69.10
72.00	70.10
73.00	71.10
74.00	72.10
75.00	73.10
76.00	74.10
77.00	75.10
78.00	76.10
79.00	77.10
80.00	78.10
81.00	79.10
82.00	80.10
83.00	81.20

84.00	82.20
85.00	83.20
86.00	84.20
87.00	85.20
88.00	86.20
89.00	87.20
90.00	88.20
91.00	89.20
92.00	90.30
93.00	91.30
94.00	92.40
95.00	93.40
96.00	94.50
97.00	95.50
98.00	96.60
99.00	97.60
100.00	98.60

APPENDIX—XXVIII

Limit of alcohol on Mother Tincture

Sr. No.	Name	H.P.I. Volume	Alcohol limit
1.	Abies Canadensis	II	72-76
2.	Abroma Augusta	I	42-46
3.	Abroma Radix	IV	29-33
4.	Abrotanum	I	72-76
5.	Absinthium	II	63-67
6.	Acalypha India	I	57-61
7.	Achyranthus Aspera	IV	74-78
8.	Acidum Benzocium	II	87-91
9.	Acidum Butyricum	III	63-67
10.	Acidum Carbolicum	II	83-87
11.	Acidum Citricum	III	91-95
12.	Acidum Oxalicum	III	91-95
13.	Acidum picrium	II	91-95
14.	AcidumSalicylicum	II	87-91
15.	Acidum Tannicum	III	89-93
16.	Aconite Napellus	I	61-65
17.	Acta Spicata	IV	74-78
18.	Adonis Vernalis	II	48-52
19.	Aegle Folia	IV	68-72
20.	Aesculus Glabra	V	56-60
21.	Aesuculus Hippocastanum	I	57.61
22.	Aethusa Cynapium	I	57-61
23.	Agaricus Emeticus	V	41-45
23a.	Agaricus Muscarius	I	41-45
24.	Agnus Castus	I	87-91
25.	Ailanthus Glandulosus	IV	65-69
26.	Alcohol, Dispensing	I	89-93
27.	Alcohol, Fortis	I	92-95
28.	Aleteris Farinosa	II	57-61
29.	Alfalfa	II	64-68
30.	Allium Cepa	I	41-45
31.	Allium Sativum	I	65-69
32.	Aloe Socotrina	I	87-91
33.	Alstonia Constricta	V	56-60
34.	Alstonia Scholaris	IV	74-78
35.	Ambra Grisea	I	91-95
36.	Amoora Rohitika	IV	74-78
37.	Ampelopsis Quinquifolia	IV	65-69
38.	Amgladus Amara	III	48-52
39.	Amyl Nitrosum	I	82-86
40.	Anacardium Orientale	I	87-91
41.	Anacardium Occidantalis	V	91-95

42.	Anagallis Arvensis	IV	56-60
43.	Andrographis Paniculata	I	57-61
44.	Augustra	III	66-70
45.	Anilium	III	84-88
46.	Anthemis Nobilis	III	66-70
47.	Anthoxanthium Odoratum	IV	69-73
48.	Antipyrium	III	91-95
49.	Apis Mellifica	I	37-41
50.	Apium Gra.		
51.	Apocynum Androsaemifollum	III	57-61
52.	Apocynum Cannabinum	I	57-61
53.	Apomorphinum Muriaticum	III	90-94
54.	Aralia Racemosa	I	79-83
55.	Arania Diadema	II	65-69
56.	Aristolochia Clematis	IV	56-60
57.	Arnica Montana	I	57-61
58.	Aristolochia Serpentaria	III	57-61
59.	Arsenicum Album	I	8-9
60.	Artemisia Vulgaris	I	61-66
61.	Arum Draconitium	IV	47-51
62.	Arum Maculatum	IV	56-60
63.	Arum Triphyllum	I	57-61
64.	Asafoetida	I	87-91
65.	Asarum Canandensis	II	57-61
66.	Asarum Europaeum	IV	56-60
67.	Asclepias Tuberosa	III	57-61
68.	Asparagus Officinalis	V	56-60
69.	Asterias Rubens	IV	56-60
70.	Atropinum Sulph	IV	86-90
71.	Avena Sativa	I	57-61
72.	Azadirachta Indica	I	57-61
73.	Badiaga	III	91-95
74.	Balsum peru	III	84-88
75.	Baptisia Tinctoria	I	63-67
76.	Barosma Crenata	V	74-78
77.	Baryta Acetica	IV	22-26
78.	Baryta Iodata	IV	57-61
79.	Belladonna	I	41-45
80.	Bellis Perennis	I	61-65
81.	Benzenum	III	84-88
82.	Benzenum Nitricum	V	85-89
83.	Berberis Aquafolia	III	66-70
84.	Berbersi Vulgaris	I	47-51
85.	Blatta Orientalis	I	87-91
86.	Buemea Odorata	IV	43-47
87.	Boerhaavia Diffusa	I	57-61
88.	Bovista	I	57-61
89.	Brachyglotis Repens	V	56-60

90.	Branca Ursina	V	65-69
91.	Bryonia Alba	I	57-61
92.	Cactus Grandiflorus	I	68-72
93.	Caladium Sanquinum	IV	47-51
94.	Calcarea Aceticum	III	54-58
95.	Calcarea Iodata	II	91-95
96.	Calendula Officinalis	I	38-42
97.	Calotropis Gigantia	I	66-70
98.	Caltha palustris	V	56-60
99.	Camphora	I	80-84
100.	Cannabis Indica	I	77-81
101.	Cannabis Sativa	I	66-70
102.	Cantharis	I	87-91
103.	Capsium Annum	II	87-91
104.	Carbonium Sulphuratum	II	84-88
105.	Carduus Marianus	I	70-74
106.	Carica papaya	II	57-61
107.	Cascara Sagrada	II	57-61
108.	Cascarilla	III	91-95
109.	Castanea Vesca	III	48-52
110.	Castoreum	III	91-95
111.	Caulophyllum Thalictroides	I	47-51
112.	Causticum	I	44-48
113.	Caanothus Americanus	I	57-61
114.	Cedron	IV	91-95
115.	Cephalendra Indica	IV	36-40
116.	Chamomilla	I	47-51
117.	Chelidonium Majus	I	41-45
118.	Chelone Glabra	IV	47-51
119.	Chenopodium Anthelmintieum	II	67-71
120.	Climaphilla Umbellata	II	66-70
121.	Chionanthus Virginica	III	57-61
122.	Chloralum	II	91-95
123.	Chloroformum	V	83-87
124.	Cicuta Virosa	I	47-51
125.	Cimicifuga Racemosa	I	58-62
126.	Cimex	III	91-95
127.	Cina	I	87-91
128.	Cinereria Maritima	V	56-60
129.	Cineraria Maritima Succus	V	6-10
130.	Cinchona Officinalis	I	75-79
131.	Cinnamomum	II	91-95
132.	Cistus Canadensis	IV	47-51
133.	Clematis Erecta	IV	56-60
134.	Cobaltum Nitricum	II	87-91
135.	Coca	II	48-52
136.	Cocculus Indicus	I	87-91
137.	Coccus Cacti	II	48-52

138.	Cochlearis Armoracia	III	57-61
139.	Coffea Cruda	I	89-93
140.	Cochicum Autumnale	I	47-51
141.	Collinsonia Canadensis	II	48-52
142.	Cococynthis	I	47-51
143.	Comocladia Dentata	V	74-78
144.	Conium Maculatum	I	57-61
145.	Convallaria Majalis	II	57-62
146.	Copaiba Officinalis	III	57-61
147.	Cornus Florida	III	57-61
148.	Cractagus Oxycantha	I	57-61
149.	Crocus Sativus	II	91-95
150.	Croton Tiglium	I	91-95
151.	Cubeba Officinalis	III	91-95
152.	Cucurbita Pepo	IV	85-89
153.	Cundurango	II	48-52
154.	Curare	IV	47-51
155.	Curcuma Longa	V	56-60
156.	Cycloman Europaeum	IV	66-70
157.	Cynodon Dactylon	II	57-61
158.	Cypripedium pubesceus	V	56-60
159.	Damiana	II	61-65
160.	Daphne Indica	IV	91-95
161.	Digitalis Purpurea	I	41-45
162.	Dioscorea Villosa	I	57-61
163.	Dolichos	III	91-95
164.	Drosera Rotundifolia	I	57-61
165.	Duboisia Hyoporoides	V	74-78
166.	Dulcamara	I	62-66
167.	Echinacea Augustifolia	I	75-79
168.	Embelia Ribes	II	57-61
169.	Epiphagus Virginiana	V	56-60
170.	Equisetum Hyemale	II	57-61
171.	Erigeron Canadensis	IV	47-51
172.	Eriodictym Glutinosum	III	75-79
173.	Eryugium Aquaticum	IV	56-60
174.	Eucalyptus Globulus	II	83-87
175.	Enonymus Atropurpurea	III	71-75
176.	Eupatorium Perfoliatum	I	47-51
177.	Eupatorium Purpurium	IV	47-51
178.	Euphorbia Corollata	IV	47-51
179.	Euphorbium	III	84-88
180.	Euphrasia Officinalis	I	57-61
181.	Fagopyrum Esculentum	IV	71-75
182.	Ferrum Muriaticum	IV	86-90
183.	Ficus Religiosa	I	69-73
184.	Filix max	II	73-77
185.	Fraxinus Americana	IV	61-65

186.	Fucus Vesiculosus	III	91-95
187.	Gambogia	III	91-95
188.	Gaultheria Procumbans	V	72-76
189.	Gelsemium Sempervirens	I	57-61
190.	Gentiana Cruciata	V	56-60
191.	Gentiana Lutea	III	48-52
192.	Geranium Maculatum	I	57-61
193.	Ginseng	III	91-95
194.	Glonoinum	II	88-92
195.	Gnaphallium Polycephalum	IV	47-51
196.	Gossypium Herbaceum	II	38-42
197.	Granatum	III	48-52
198.	Gratiola Officinalis	V	56-60
199.	Grindelia Robusta	III	79-83
200.	Guaiacum	II	83-87
201.	Guarea Trichiloides	IV	47-51
202.	Gymnema Sylvestre	I	76-80
203.	Haemotoxylon Campechianum	III	48-52
204.	Hamamelis Virginica	I	57-61
205.	Hedra Helix	V	56-60
206.	Helianthus Aunus	V	47-51
207.	Heleborus Niger	I	57-61
208.	Helonias Dioica	III	57-61
209.	Holarrhena Antidysentrica	I	56-60
210.	Hydrangea Arboresecens	III	57-61
211.	Hydrastis Canadensis	I	57-61
212.	Hydrocotyl Asiatica	I	66-70
213.	Hyocyamus Niger	I	52-56
214.	Hypericum Perforatum	I	71-75
215.	Iberis Amara	IV	56-60
216.	Ignatia Amara	I	79-83
217.	Illicium Anisatum	III	91-95
218.	Inula	III	80-84
219.	Iodium	I	91-95
220.	Ipecacuanha	I	74-78
221.	Iris Versicolor	II	57-61
222.	Jaborandi	II	91-95
223.	Jalapa	II	91-95
224.	Jatropha Curcas	IV	91-95
225.	Janosia Ashoka	I	82-86
226.	Juglens Cineria	IV	70-74
227.	Juglens Regia	IV	41-45
228.	Juncus Offusus	V	56-60
229.	Juniperus Communis	II	79-83
230.	Justisia Adhatoda	I	72-76
231.	Kali Iodatum	I	54-60
232.	Kaluria Latifolia	IV	56-60
233.	Kreosotum	I	82-86

234.	Lachinanthus Tinctoria	IV	56-60
235.	Lappa Major	III	57-61
236.	Laurocerasus	III	47-51
237.	Ledum Palustre	I	76-80
238.	Lemna Minor	IV	34-38
239.	Leptendra	III	57-61
240.	Lilium Tigrinum	V	28-32
241.	Lobelia Cardinalis	V	56-60
242.	Lobelia Inflata	II	65-69
243.	Lolium Temulentum	V	47-51
244.	Lupulus	III	91-95
245.	Lycopersicum Esculentum	V	47-51
246.	Lycopodium Clevatum	I	91-95
247.	Lycopus Virginicus	IV	56-60
248.	Mancinella	V	65-69
249.	Melilotus Alba	II	48-52
250.	Menispermum Canadense	V	65-69
251.	Mentha Piperata	II	57-61
252.	Menyanthes Trifoliata	II	57-61
253.	Mercurialis Perennis	IV	43-47
254.	Mezereum	I	75-79
255.	Mercurias Corr	I	87-91
256.	Millefolium	IV	56-60
257.	Moschus	II	47-51
258.	Mygale	III	47-51
259.	Myrica Cerifera	I	72-76
260.	Myrtus Communis	IV	65-69
261.	Nitri Spiritus Dulcis	IV	84-88
262.	Nux Moschata	I	87-91
263.	Nux Vomica	I	74-78
264.	Nyctanthes Arbortristris	III	57-61
265.	Nymphea Odorata	V	41-45
266.	Ocimum Sanctum	I	72-76
267.	Oenothus Crocata	V	38-42
268.	Oleander	III	57-61
269.	Oleum Animale	IV	84-88
270.	Oleum Santali	II	82-86
271.	Opium	I	47-51
272.	Paeonia Officinaslis	IV	56-60
273.	Pareira Brava	III	66-70
274.	Paeris udrifolia	IV	56-60
275.	Passiflora Incarnata	II	57-61
276.	Pastinaca Sativa	V	71-75
277.	Paullina Pinnata	V	71-75
278.	Petroleum	I	87-91
279.	Petroselinum Sativum	IV	91-95
280.	Phallendrium Aquaticum	V	91-95
281.	Phosphorus	I	91-95

282.	Physostigma Venenosum	II	91-95
283.	Phytolacca	I	57-61
284.	Pimpinella Saxifraga	V	56-60
285.	Pinus Sylvestris	V	79-83
286.	Piper Methysticum	III	91-95
287.	Piper Nigrum	III	91-95
288.	Piscidia	III	75-79
289.	Plantago Major	II	62-66
290.	Podophyllus Petlatum	I	61-65
291.	Polygonum Punctatum	IV	65-69
292.	Polyporus Officinallis	IV	56-60
293.	Poppulus Candicans	III	66-70
294.	Poppulus Tremuloides	V	47-51
295.	Pothos Foetidus	IV	47-51
296.	Prunus Padus	V	56-60
297.	Prunus Spinosa	IV	56-60
298.	Prunus Virginiana	III	57-61
299.	Psoralia Corylifolia	I	91-95
300.	Ptelia Trifoliata	IV	69-73
301.	Pulsatilla Nigricans	I	66-70
302.	Pysus Americana	V	66-70
303.	Ranunculus Acris	V	65-69
304.	Ranunculus Bulbosus	IV	65-69
305.	Ranunculus Scleratus	IV	56-60
306.	Raphanus Sativus	V	47-51
307.	Ratanlia	II	56-60
308.	Rauvolfia Serpentina	I	75-79
309.	Rhamnus Frangula	III	75-79
310.	Rhamnus Catharticus	IV	56-60
311.	Rheum	II	57-61
312.	Rhododendron Chrysanthium	II	75-79
313.	Rhus Toxicodendron	I	75-79
314.	Rhus Venenata	II	75-79
315.	Ricinus Communis	III	91-95
316.	Robinua Pseudocacia	V	75-79
317.	Rumex Cripspus	II	57-61
318.	Ruta Graveolens	I	66-70
319.	Sabadilla	I	75-79
320.	Sabal Serrulata	II	47-51
321.	Sabina	I	82-86
322.	Salix Nigra	II	47-51
323.	Salix Purpurea	III	47-51
324.	Sambucus Nigra	II	47-51
325.	Sanguinaria Canadensis	I	57-61
326.	Sarsaparilla	III	48-52
327.	Sarracenia Purpurea	IV	56-60
328.	Scutellaria	III	48-52
329.	Secale Cornutum	I	44-48

330.	Senecio Aureus	II		47-51
331.	Senega	I		47-51
332.	Senna	III		47-51
333.	Sinapis Alba	III		91-95
334.	Sinapis Nigrum	III		91-95
335.	Spongia Tosta	I		74-78
336.	Solanum Carolinense	V		56-60
337.	Solanum Nigrum	II		57-61
338.	Solidago Virgaurea	V		56-60
339.	Spigelia	II		75-79
340.	Squilla	III		56-60
341.	Staphisagria	I		87-91
342.	Sticta Pulmonaria	IV		47-51
343.	Stallingia Sylvatica	III		57-61
344.	Stramonium	II		57-61
345.	Strophanthus Hispidus	II		91-95
346.	Sulphur	I		91-95
347.	Sumbul	II		75-79
348.	Symphoricarisus Racemosus	V		75-79
349.	Symphytum Officinale	III		48-52
350.	Syzygium Jambolinum	I		82-86
351.	Tabacum	I		75-79
352.	Taraxacum	III		48-52
353.	Tarentula Hispana	II		44-48
354.	Taxus Buccata	III		80-84
355.	Terebinthinae Oleum	II		84-88
356.	Treminalia Arjuna	I		79-83
357.	Terminalia Chebula	II		57-61
358.	Teucrium Marum Verum	IV		56-60
359.	Thea Chinensis	V		56-60
360.	Tamus Communis	V		47-51
361.	Tanacetum Vulgaris	V		61-65
362.	Theridion	III		44-48
363.	Thalspi Bursa Pastoris	V		52-56
364.	Thuja Oecidentalis	I	III	80-84
365.	Thymolum	V		48-52
366.	Tilia Europoea	V		48-52
367.	Tinospora Cordifolia	II	I	45-49
368.	Tongo	III	I	91-95
369.	Tribulus Terrestris	I	I	58-62
370.	Trifolium Partense	V		65-69
371.	Triticum Repens	III	I	57-61
372.	Tussilago Fariero	IV	I	44-48
373.	Tussilago Petasites	V	I	41-45
374.	Urtica Urens	IV	I	47-51
375.	Usnea Barbata	V	I	65-69
376.	Ustilago Maydis	III	I	57-61
377.	Uva Ursi	III	I	57-61

378.	Valeriana Officinalis	II	III	48-52
379.	Verbascum Thapsus	II	III	48-52
380.	Veratrum Album	II	I	75-79
381.	Veratrum Vir	I	I	72-76
382.	Viburnum Opulus	II	I	57-61
383.	Viburnum Prunifolium	II	I	57-61
384.	Vinca Minor	IV	I	71.5-76.5
385.	Viola Odorata	IV	I	61-65
386.	Viola Tricolor	IV	I	56-60
387.	Viscum Album	II	I	75-79
388.	Withania Somnifera	I	I	72-76
389.	Xanthozylum Fraxincum	III	III	73-77
390.	Yucca Filamentosa	V	I	75.5-79.5
391.	Zingiber Officinalis	II	III	89-93

INDEX

A

Abies nigra
Acrid agaric
Acetic acid
Acetone
Aesculus glabra
Agaricus emeticus
Alcohol
Alstonia constricta
Alumina phosphorica
Amber resin
Ammonium nitricum
Ammonium phosphoricum
Ammonium phosphate
Ammonium picricum
Ammonium picrate
Ammonium valiadate
Anacardium occidentale
Antimonium Oxydatum
Appendices
Arsenious acid
Asparagus officinalis
Aspon
Aurum Sulphuratum

B

Barium Sulphate
Barium Sulphuricum
Barosma Crenata
Barosma crenulata
Bearded usnea
Benzedine
Benzinum nitricum
Beryllium metallicum
Blooming spurge
Brachyglottis repens
Branca ursina
Buckthorn

C

Calcarea muriatica
Calcium chloride
Caltha palustris
Chamomilla
Chlorine

Chloroformum
Chlorum
Chrysarobinum
Chlorosulphuric acid
Cineraria maritima
Cocaine hydrochloride
Cocainum muriaticum
Cocculin
Comocladia dentata
Corkwood tree
Curcuma longa
Cyclohexane

D

Diethylamine
Dimethyl glyoxine
Dinitrobenzene alcoholic solution
Diphenyl Carboxide
Dithizone
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Iodohydroxyquinoline sulphonic Acid
Iodoplatinate
Iodum
Ioduretum Sulphuris
Ipecac
Ipecacuanha
Ipomoea purga
Iridium metallicum
Iris Versicolor
Iron
Iron Limit Test
Iron Solution Standard

Iron-Metallic
Iron-Reduced
Isatin
Ivy gourd

J

Jaborandi
Jalapa
Jamaica Dogwood
Jamalghota
Jambu
Jamoon
Janosia Ashoka
Jatropha Curcas
Jey
Johns Wort
Jonkamari
Jugulans Cinerea
Jugulans regia
Juncus effusus
Juniperi fructus
Juniperus Communnis
Juniperus Sabina
Justicea Adhatoda

K

Kabab Chini
Kaddu
Kakamachi
Kakamari
Kali aceticum
Kali Bichromicum
Kali bromatum
Kali Carbonicum
Kali Chloricum
Kali chromicum
Kali Chromicum Rubrum
Kali Cyanatum
Kali ferrocynatum
Kali Iodatum
Kali Mirch
Kali Muriaticum
Kali nitricum

Kali Oxalicum
Kali Permanganicum
Kali Phsophoricum
Kali picricum
Kali Sulphuricum
Kali Tartaricum
Kalium Carbonicum
Kalium Chloridum
Kalium Iodatum
Kalium Phosphoricum
Kalium Sulphuricum
Kalmegh
Kalmia latifolia
Kalvala
Kanphul
Kapas
Kash
Kashmal
Kasturi
Kava Kava
Kavali
Kawar
Kerm dara
Kesar
Khandai
Khesari
Khokali
Khursani Ajvayan
Kirata
Kirmala
Kiryat
Knot root
Kola nut
Koti
Krameria Triandra
Kreosote
Kreosotum
Kuchla
Kunain
Kundri
Kura

Kurchi
Kurdamana

L

Lac defloratum
Lac vaccinum
Lachesis
Lachnanthes tinctoria
Lactic acid
Lactic Acid
Lactose
Ladys Love
Lahuriya
Lalmirch
Lanolin
Lappa Major
Larch agaric
Lard
Larkspur-palmated
Lasun
Lasunghas
Lathyras sativa
Laurocerasus
Lead
Lead Acetate
Lead acetate
Lead acetate
Lead Acetate Solution
Lead Chloride
Lead chromate
Lead dioxide
Lead monoxide
Lead Paper
Lead Solution Standard
Leather Charcoal
Ledum Palustre
Lemna minor
Leontice Thalictroides
Leopards Bane
Leptandra
Leptandra Virginica
Lesser periwindle

Limit Tests
Liniments
Liquor Ammonii Fortis
List of Monographs
Lithic Carbonate
Lithium benzoicum
Lithium Carbonicum
Litjira
Litmus
Liver lily
Liver of Sulphur
Lizarin
Lobelia Cardinalis
Locust
Log-Wood
Lolium temulentum
Long Birthword
Lotions
Louse Seed
Lucerne
Lung wart
Lupulus
Lycopersicum esculentum
Lycopodium Clavatum
Lycopordon Bovista
Lycopus uniflorus
Lycopus Virgircans
Lytta Resicatoria

M

Maceration
Madewort
Madhu Makhi
Magnese Di-oxide
Magnesia Carbonica
Magnesia Muriatica
Magnesii Carbonas
Magnesii Chloridum
Magnesium
Magnesium acetate
Magnesium Carbonate
Magnesium Carbonicum

Magnesium Chloride
Magnesium hydrogen phosphate
Magnesium phosphate
Magnesium phosphoricum
Magnesium powder
Magnesium solution
Magnesium Sulphate
Magnesium sulphate
Magnesium Sulphate Solution, 0.05M
Magnesium sulphurica
Magnesium Uranyl Acetate
Magnesium Uranyl Acetate Solution
Magnetic oxide of iron
Mahendravaruni
Maize Amut
Makoi
Male Fern
Mancinella
Manganese Carbonate
Manganese dioxide
Manganous acetate
Manganum aceticum
Manganum Carbonicum
Manganum muriaticum
Manganum oxydatum nigrum
Mannitol
Mapato
Marking Nut
Marsdenia curdurango
Marsh Cistus
Marsh marigold
Materials and Solutions employed in tests
May Apple
May lily
May pop
Medorrhinum
Melia Azadirachta
Melilotus alba
Melon tree
Melting Range
Mentha hircina

Mentha officinale
Mentha piperita
Menyanthes trifoliata
Merasingi
Mercurialis perennis
Mercuric ammonium thiocyanate solution
Mercuric Chloride
Mercuric Cyanide
Mercuric Iodide
Mercuric nitrate
Mercuric nitrate
Mercuric sulphate black
Mercuric Sulphide
Mercurii Iodidum
Mercurius Biniodatus
Mercurius Corrosivus
Mercurius Cynatus
Mercurius Dulcis
Mercurius et kali iodatus
Mercurius Iodatus Flavus
Mercurius Iodatus Ruber
Mercurius nitricus
Mercurius Solubilis
Mercurius Sublimate Corrosivus
Mercurius vivus
Mercurous Chloride
Mercurous Nitrate
Mercury
Mercury
Meshashringi
Metallic Platinum
Metaphosphoric Acid
Methyl Alcohol
Methyl alcohol
Methyl ethyl ketone
Methyl Orange
Methyl Red
Methyl amino phenol
Mezereon
Mezereum
Millifolium

Mistletoe
Mitha Zaher
Mocha
Momordica elatarium
Monographs (List)
Mordant Black
Mordent red
Morphine hydrochloride
Morphinum muriaticum
Moschus
Moschus moschiferous
Mother Tincture for External Use
Mother Tinctures
Mountain Tobacco
Mucuna Pruriens
Mucuna Prurita
Mudar
Mugwort
Mugwort
Muhti
Mullein
Munduk Parni
Murex brandaris
Murex Purpurea
Muriate of Morphia
Muroxide
Musk
Musk root
Mycobacterium tuberculosis
Mygale
Mygale Lasidora
Myrica Cerifera
Myristica Fragrans
Myrobalan
Myrtle
Myrtus Communis

N

Nagadouna
Naja tripudians
Nanny bush
Naphthalene

Naphthelinum
Naphthol Solution
Narceinium
Narcotine
Narcotinum
Natrium Chloratum
Natrum arsenicum
Natrum Boracicum
Natrum bromatum
Natrum Carbonicum
Natrum chloratum
Natrum iodatum
Natrum Muriaticum
Natrum nitricum
Natrum Phosphate
Natrum Phosphoricum
Natrum salicylicum
Natrum silicatum
Natrum Sulphate
Natrum sulphuratum
Natrum sulphuricum
Nerium Oleander
New Jersey Tea
Niccolum carbonicum
Niccolum Metallicum
Nickel
Nickle sulphate
Nicotiana Tabaccum
Night Blooming Cercus
Night Jasmine
Ninhydrin
Nitrates
Nitri spiritus Dulcis
Nitric Acid
Nitric Acid
Nitric Acid fuming
Nitrobenzealdehyde
Nitrobenzene
Nitrobenzene
Nitroglycerin
Nitroxanthic acid

Nocesseria geithea
Nosodes preparation
Nut Moschata
Nut-meg
Nux Juglans
Nux Vomica
Nyctanthes arbortristis
Nymphaea odorata

O

Oak
Oat
Ocimum Sanctum
Octopus
Oenanthe crocata
Oenanthe phellandrium
Official Sampling
Oil of sandal wood
Oil of santal
Oil of Virtriol
Oils
Ointments
Olat Kambal
Olatkambal
Old Method of Preparation
Oleander
Oleum animale
Oleum Petrae Album
Oleum santali
Olive Oil
Onion
Opium
Opodoldocs
Ordeal bean
Orobanche Virginiana
Orthohydroxy benzoic acid
Orthophosphoric Acid
Oxalic Acid
Oxalic Acid
Oxalic Acid Ammoniacal
Oxalic Acid Solution
Oxalic Acid, 0.1N

Oxide of Bismuth
Oxygen flask method

P

Paeonia officinalis
Palladium
Pansy
Papaver Somniferum
Papaya
Papeeta
Pappoose Root
Para
Paraffin Hard
Paraffin liquid
Paraffin Soft
Pareira Brava
Paris quadrifolia
Passiflora incarrata
Passion flower
Pastinaca
Pastinaca sativa
Paullinia pinnata
Pavia glabra
Peony
Peppermint
Perchloric acid
Perchloric acid O2N
Percolation
Perenial Indian hemp
Peruvian Bark
Petasites japonicaus
Petroleum
Petroleum ether
Petroleum Ether Light
Petroselinum crispum
Petroselinum petrose
Petroselinum sativum
pH Ranges
pH Values
Pheasanti’s eye
Phellandrium
Phenazone

Phenazone
Phenic acid
Phenol
Phenolphthalein
Phenylic acid
Phindak
Phioroglucinnol
Phosphate of Calcium
Phosphate of Potassium
Phosphomolybdic acid
Phosphore
Phosphoric Acid
Phosphorus pentoxide
Phosporus
Physostigma Venenosum
Phytolacca
Phytolacca Americana
Picric acid
Picrotoxinum
Pilocarpinum muriaticum
Pilocarpus
Pilocarpus jaborandi
Pingyat
Pinkroot
Pinus sylvestris
Pipal
Piper Cubeba
Piper Methysticum
Piper Nigrum
Pipperidge Bush
Piscidia
Pitcher plant
Piyaz
Plantago major
Plantain
Plasters
Platina
Platinic chloride
Platinum Metallicum
Platinum muriaticum
Pleurisy Root

Plumbago
Plumbum & Plumbum Metallicum
Plumbum aceticum
Plumbum chromicum
Podapatri
Podophyllum Peltatum
Poison American Arum
Poison Ash
Poison dogwood
Poison Hemlock
Poison Ivy
Poison Nut
Poison sumac
Polygala Sanega
Polygonum fagopyrum
Polygonum punctatum
Polyporus officinalis
Poppy
Populus Candicans
Populus tremuloides
Potash alum
Potassi Phosphas
Potassi Sulphas
Potassii Bichromas
Potassium
Potassium acetate
Potassium alum
Potassium antimonate
Potassium bicarbonate
Potassium Bisulphate
Potassium bromate
Potassium bromide
Potassium bromide
Potassium Carbonas
Potassium Carbonate
Potassium Chlorate
Potassium Chloridum
Potassium Chromate
Potassium chromate
Potassium Cupritartarate
Potassium Cyanide

Potassium cyanide
Potassium Dichromate
Potassium Ferricyanide
Potassium Ferrocyanide
Potassium ferrocyanide
Potassium Hydroxide
Potassium hydroxide
Potassium Iodate
Potassium Iodide
Potassium Iodidum
Potassium Iodobismuthate Solution
Potassium mercuric iodide
Potassium Mercuric Iodide Alkaline Solution
Potassium Mercuric Iodide Solution
Potassium nickel cyanide
Potassium Nitrate
Potassium nitricum
Potassium Oxalate
Potassium Permanganate
Potassium Permanganate
Potassium permanganate
Potassium Permanganate Acidic
Potassium Permanganate Solution
Potassium Permanganate, 0.1N
Potassium picrate
Potassium Plumbite Solution
Potassium Tartarate
Potassium Thiocyanate
Potentisation
Pothos foetidus
Poultices
Preface
Prickly ash
Prickly Chaff flower
Prunus Amygdalus
Prunus Communis
Prunus laurocerasus
Prunus padus
Prunus Serotina
Prunus spinosus
Psoralea Corylifolia

Ptelea trifolia
Pu
Pulsatilla Nigricans
Pumpkin
Punarnava
Punica granatum
Purging Nut
Purging nut
Purified Water
Pussy willow
Pyrogen test
Pyrus
Pyrus americana

Q

Quartz
Queen Delight
Quininae Arsenis
Quininae Sulphas
Quinine hydrochloride
Quinine Sulphate

R

Radium bromide
Ragwort
Ranunculus acris
Ranunculus bulbosus
Ranunculus scleretus
Ranunculus speciosus
Raphanus hortensis
Raphnus sativus
Ratanhia
Ratanhia peruviana
Rattle snake
Rattle Snake Milk-wort
Rattle snake-beans
Rauvolfia Serpentina
Red Iodide of Mercury
Red lover
Red pepper
Red Sulphide of Mercury
Red willow
Refractive Index

Resorcinol
Rhamnose
Rhamnus catharticus
Rhamnus Frangula
Rhatany
Rhematism weed
Rheum
Rheum emodi
Rheum officinales
Rheum palmatum
Rhodamine B
Rhodamine B Solution
Rhododendron
Rhododendron Chrysanthum
Rhoituka
Rhubarb
Rhus Toxicodendron
Rhus Venenata
Rhus Vernix
Ribgrass
Ricinus Communis
Ringo
Robinia pseudocacia
Rock Crystals
Rock Oils
Rocky Mountains Grape
Roman chemomile
Rose laurd
Rosemary Oil
Roundleaved Sundew
Rubin’s Camphor
Rubinus Arsenicalis
Rumex Crispus
Russel’s Viper
Ruta Graveolens

S

Sabal serrulata
Sabedilla
Sabina
Saccharum Lactis
Sacred Anise tree

Sacred bark
Sadab
Safed arand
Saffron
Sag-angur
Sal Ammoniac
Salicylates (test)
Salicylic acid
Saline solution
Salix nigra
Salix Purpurea
Sambucus lacinata
Sambucus nigra
Sampling, Official Method of
Sana
Sandal
Sanguineria Canadensis
Santhoxylum Americanum
Santonine
Santoninum
Saracennia purpurea
Sarpagandha
Sarsaparilla
Satap
Satwan
Savin
Saw palmeto
Schoenocaulon Officinale
Scilla maritima
Scotch pine
Scouring rush
Scutellaria
Sea Snail
Secale Cornutum
Selenium
Semecarpus Anacardium
Senecio aureus
Senecio cineraria
Senega
Senna
Senna Leaf

Sepia
Sesame Oil
Seven Barks
Sheeles Green
Shepherd’s purse
Sieves
Silica
Silica Gel
Silica Gel ‘G’
Silicea
Silicon Dioxide
Silver
Silver Amine Nitrate
Silver Chloride
Silver cyanide
Silver grass
Silver iodide
Silver Nitrate
Silver Nitrate Solution
Silver Nitrate Solution, 20 percent
Silybum Marianum
Sinapis Alba
Sinapis Nigra
Snake lily
Snake root
Snake root
Snow bread
Snow rose
Soap
Sodic Pyroborate
Sodii Boras
Sodii Carbonas
Sodii Chloridum
Sodii Phosphas
Sodii Sulphas
Sodium
Sodium acetate
Sodium Acetate Solution, 10 percent w/v
Sodium Bicarbonate
Sodium bicarbonate
Sodium Bicarbonate Solution, 5 percent w/v

Sodium Bicarbonate Solution, Saturated
Sodium bromide
Sodium Carbonate
Sodium Carbonate
Sodium Carbonate Anhydrous
Sodium chlorate
Sodium Chloride
Sodium Chloride Solution, 20 percent
Sodium Citrate
Sodium Cyanide Solution
Sodium Diethyl Dithio Carbamate 0.1% w/v Solution
Sodium Hydroxide
Sodium Hydroxide Solution, Ammonia-free
Sodium Hydroxide, Nitrogen free
Sodium iodide
Sodium Nitrate
Sodium nitrate
Sodium Nitrate Solution 1 percent w/v; 10 percent w/v
Sodium Nitroprusside
Sodium Nitroprusside Solution
Sodium periodate
Sodium Phosphate
Sodium Plumbite Solution
Sodium Potassium Tartarate
Sodium Salicylate
Sodium silicate
Sodium Sulphate
Sodium sulphate
Sodium Sulphate Anhydrous
Sodium Sulphide
Sodium Tartarate
Sodium Thiosulphate
Sodium thiosulphate
Sodium Thiosulphate Solution
Sodium Tungstate
Soft Soap
Solanum carolinense
Solanum Dulcamara
Solanum lycopersicum
Solanum nigrum
Solidago virgaurea

Solubility
Solutions
Solutions employed in Volumetric Analysis
Sophera Tinctoria
Southernwood
Specific Gravity
Spectacled snake
Spermaceti
Spigelia
Spigelia marialandica
Spinard
Spirit of turpentine
Spiritwood
Spongia palustris
Spongia Tosta
Spongilla lacustris
Spotted Alder
Spotted Cranes Bill
Sqaw weed
Squilla
Squirting Cucumber
St. Ignatus Bean
Stannous Chloride, Solution of
Stannum Metallicum
Staphysagria
Starch
Starch
Starfish
Stargrass
Starwort
Sterculia accuminata
Sticta pulmonaria
Stillingia Sylvetica
Stinking weed
Stone root
Stramonium
Strong Alcohol
Strontium carbonicum
Strophanthus hispidus
Strychnine phosphate
Strychninum mitricum

Strychninum phosphoricum
Strychninum sulphuricum
Strychnos Ignatia
Strychnos Nux-vomica
Subchloride of Mercury
Sublimated Sulphur
Sucrose
Sucrose
Sudan red
Sugar of Milk
Sulphanilamide
Sulphate of Calcium
Sulphate of Potassium
Sulphates
Sulphosalicyclic acid
Sulphur
Sulphur Di-iodide
Sulphur Iodatum
Sulphur Sublimatum
Sulphuric Acid
Sulphuric acid
Sulphuric Acid 1 percent, 25 percent, 50 percent
Sulphurous Acid
Sulphurous Acid
Sumbul
Surukuke
Sweet scented spurge laurel
Sweet scented violet
Sweet Vernal grass
Sweet water lily
Sweeting Plant
Sycon Gelatinosum
Symbols of Elements
Symphoricarpus racemosus
Symphytum Officinale
Syphlinum
Syzygium cuminii

T

Tabacum
Tablets
Tail Chatta

Tall butter cup
Tamaku
Tambaku
Tamus communis
Tanacetum vulgare
Tannic Acid
Tannic Acid Solution
Taraxacum
Taraxacum Officinale
Tarentula hispana
Tartar Emetic
Tartarate
Tartarate of Antimony & Potassium
Tartarian Southern wood
Tartaric Acid
Tartaric acid
Tartarus Vitriolatus
Taxus Baccata
Tellurium
Temperature
Terebinthinae oleum
Terminalia Arjuna
Terminalia chebula
Test for Arsenic
Test for Chlorides
Test for Heavy Metals
Test for Iron
Test for Lead
Test for the Absence of Arachis Oil
Test for the Absence of Cotton Seed Oil
Test for the Absence of Linseed Oil
Test for the Absence of Sesame Oil
Teucrium marum Virum
Thalapsi bursa pastoris
Thallium
Thea chinensis
Theridion
Theridion Curassavicum
Thioglycollic Acid
Thiosinaminum
Thiosulphate

Thorn apple
Thuja Occidentalis
Thymol blue
Thymolum
Thyroid dessicated
Thyroidinum
Tilia europaea
Tilia vulgaris
Tin
Tinospora Cordifolia
Titanium
Tithymalopsis corollata
Toad
Tobacco
Toluene
Tomato
Tongo
Tongo Bean
Tonquin musk
Traponem apallium
Tribulus Terrestris
Trichloral acetic acid
Triethanol Amine
Trifolium pratense
Trinitrophenol
Triticum Repens
Trituration
Trituration, Conversion into Liquid
True Cramp bark
Trumpet weed
Tuberculinum
Tulsi
Turmeric
Turmeric
Turmeric Paper
Turnera aphrodisiaca
Turnera diffusa
Tussilago
Tussilago petasites

U

Unicorn root

Uppana
Upright Virgins Bower
Uranium nitrate
Uranium nitricum
Uranyl Acetate
Urea
Urginea Maritima
Urtica Urens
Usnea barbata
Ustilago Maydis
Uva Ursi

V

Valeriana officinalis
Valerianate of Zinc
Vasaka
Vegetable Charcoal
Velvet dock
Velvet leaf
Veratrum album
Veratrum Virdie
Verbascum thapsus
Veronica Verginica
Veronicastrum Virginicum
Viburnum edule
Viburnum opulus
Viburnum prunifolium
Vilayat Mehndi
Vilayati afsantin
Vinca minor
Viola odorata
Viola tricolour
Viper
Vipera torva
Viscosity determination
Viscum album
Vitex Agnus Castus
Volatile Salt

W

Wartex Puff Ball
Water ash
Water dropwort

Water flag
Water for injection
Water Hemlock
Water-Ammonia Free
Water-Carbon Dioxide Free
Water-Purified
Watpat
Wax Myrtle
White ash
White Mustard Seeds
Wikstroemia foetida
Wild Black Cherry
Wild ginger
Wild Indigo
Wild liquorice
Wild Rosemary
Wild snake root
Willaytigowth
Wind Flower
Winter green
Winter green
Witch Hazel
Withania Somnifera
Wood Charcoal
Worm goose foot
Worm grass
Worm seed
Worm wood
Wormseed

X

Xanthoxylum Fraxineum

Y

Yarrow
Yerba Santa
Yonan musk
Yueca filamentosa

Z

Zaffran
Zerzul
Zinc
Zinc acetate

Zinc bromide
Zinc chloride
Zinc Granulated
Zinc Metallicum
Zinc Oxide
Zinc phosphide
Zinc solution
Zinc sulphate
Zinc Sulphate
Zinc sulphate
Zinc Sulphate Saturated Solution
Zinc Vitriol
Zincum aceticum
Zincum bromatum
Zincum muriaticum
Zincum Oxydatum
Zincum phosphoratum
Zincum sulphuricum
Zincum valerianicum
Zingiber
Zingiber officinale