HOMOEOPATHIC PHARMACOPOEIA OF INDIA

(H. P. I.)

VOLUME V

1986

GOVERNMENT OF INDIA
MINISTRY OF HEALTH

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FOREWORD

The Homoeopathic Pharmacopoeia Committee was constituted 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:—

1. Preface
2. Introduction
3. General Notices
4. General Instructions
5. 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

Sd/-
(DR. DIWAN HARISH CHAND)
Chairman
Homoeopathic Pharmacopoeia Committee

NEW DELHI,
Dated : 30th July, 1985.

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:—

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

(ii) to lay down principles and standards for the preparation of homoeopathic drugs;

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

(iv) 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 & 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., L.R.C.P. (Edin.) D.T.M & 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, Mangalore	*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-Secretary*

The Committee appointed a Working Group consisting of the following members to scrutinise the initial drafts of monographs prepared by the staff:—

1. Dr. P.N. Mehra . . . . . — *Chairman*
2. Shri. P.N. Verma . . . . . — *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 & 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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INTRODUCTION

Four volumes of Homoeopathic Pharmacopoeia of India have already been published as follows:—

Volume	No. of mono-graphs	Year of publi-cation
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 114 monographs. Although the general notices and general instructions are mainly contained in Volume I (1971), some amendments have been made subsequently in Volume II and Volume III of H.P.I., 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.

2—1 M of HFW/ND/86

INTRODUCTION

Four volumes of Homoeopathic Pharmacopoeia of India have already been published as follows:—

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2—1 M of HFW/ND/86

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 monograph on Chamomilla of Volume I stands superseded by a revised monograph appearing in this Volume.

LIST OF MONOGRAPHS WITH ABBREVIATIONS

S.No.	*Name of 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	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.	Benzium Nitricum	Benz. nit.
17.	Beryllium Metallicum	Be. metal.
18.	Bothrops Lanceolatus	Brac. rep.
19.	Brachyglottis Repens	Brac. rep.
20.	Branca Ursina	Branca
21.	Calcarea Muriatica	Calc. mur.
22.	Caltha Palustris	Cal. pal.
23.	Chamomilla	Cham.
24.	Chloroformum	Chlf.
25.	Chlorum	Chlorum
26.	Chrysarobinum	Chrysb.
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 Myoporoides	Dub. myop.
33.	Epiphagus Virginiana	Epi. vir.
34.	Euphorbia Corolleta	Euphor. c.
35.	Eupionum	Eupion.
36.	Ferrum Magneticum	Fer. mag.

S.No.	Nome of Monograph	Abbreviation
37.	Gaultheria Procumbans	Gal. proc.
38.	Gentiana Cruciata	Gent. c.
39.	Gratiola Officinalis	Grant. off.
40.	Hedera Helix	Hed. hel.
41.	Helianthus Annue	Hel. ann.
42.	Hyoscyaminum	Hyosn.
43.	Iodoformum	Iodom.
44.	Juncus Effusus	Juncus
45.	Kali Chromicum	Kali
46.	Lilium Tigrinum	Lil. tig.
47.	Lithium Benzoicum	Lith. benz.
48.	Lobelia Cardinalis	Lob. card.
49.	Lolium Temulentum	Lol. tem.
50.	Lycopersicum esculentum	Lyco. esc.
51.	Mancinella	Mancin.
52.	Manganum Muriaticum	Mng. mur.
53.	Manganum Oxidatum Nigrum	Mang. oxy.
54.	Menispermum Canadense	Meng.
55.	Mercurius et. Kali Iodatus	Merc. kl.
56.	Mercurius Nitricus	Merc. nit.
57.	Narcotenium	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. sul.
63.	Niccolum Carbonicum	Nic. carb.
64.	Niccolum Metallicum	Nic. met.
65.	Nymphea Odorata	Nym. odo.
66.	Oenanthus Crocata	Oen. croc.
67.	Palladium	Pallad.
68.	Pastinaca	Pastin.
69.	Paullinia Pinnata	Paul. p.
70.	Phellandrium Aquaticum	Phel. aq.
71.	Picrotoxinum	Picrot.
72.	Pilocarpinum Muriaticum	Pil. mur.
73.	Pinus Sylvestris	Pin. syl.
74.	Platinum Muriaticum	Plat. mur.
75.	Plumbum Aceticum	Pb. acet.

S.No.	Name of Monograph	Abbreviation
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.
83.	Rhamnus Catharticus	Rham. cat.
84.	Robinia Pseudocacia	Robinia
85.	Santoninum	Santon.
86.	Solanum Carolineuse	Sol. caro.
87.	Solidago Virgaurea	Sol. vir.
88.	Stercula Accuminata	Ster. ac.
89.	Strontium Carbonicum	Str. carb.
90.	Strychninum Nitricum	Stry. nit.
91.	Strychninum Phosphoricum	Stry. ph.
92.	Strychninum Sulphuricum	Stry. sul.
93.	Sulphanilamide	Sulamid.
94.	Symphoricarpus Racemosus	Sym. rac.
95.	Tamrus Communis	Tamus c.
96.	Tanacetum Vulgare	Tan. vulg.
97.	Thallium	Thal.
98.	Thea Chinensis	Thea
99.	Thiosinaminum	Thiosin.
100.	Thlapsi Bursa Pastoris	Thalb. p.
101.	Thymol	Thymol
102.	Tilia Europaea	Til. euro.
103.	Titanium	Titan.
104.	Trifolium Pratense	Tri. prat.
105.	Tussilago Petasites	Tuss. pet.
106.	Uranium Nitricum	Uran. nit.
107.	Usnea Barbata	Usnea b.
108.	Yucca Filamentosa	Yul. fila.
109.	Zincum Aceticum	Zinc. ac.
110.	Zincum Bromatum	Zinc. br.
111.	Zincum Muriaticum	Zinc. mur.
112.	Zincum Oxydatum	Zinc. ox.
113.	Zincum Phosphoratum	Zinc. ph.
114.	Zincum Valerianicum	Zinc. val.

ABIES NIGRA

(Abies. n)

Amber Resin.

Description : Resin is obtained by distilling the volatile oil from the oleo-resin, obtained from *Abias nigra, Pinus nigra.* Transluscent, 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 purples 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 : 150-180 C (H.P.I. Vol. I, p. 245).

Sulphated ash : Not more than 0.2 per cent (H.P.I. Vol. I, page 230.)

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

100g Abies Nigra

Strong Alcohol in sufficient quantity

To make one thousand millilitres of the Mother Tincture.

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

3—1 M of HFW/ND/86

AESCULUS GLABRA

(Aescul. g.)

Bot. name : *Aesculus glabra* Willd. Family : Hippocastanaceae

Synonyms : *Aesculus chinensis*, Michz, *Pavia glabra* Spach, *P pallida*, Spach.

Common names : *English* : Foetid, Chic Buckeys, Smooth leaved horse chestnut.

Description : Small tree, upto 10 m in height with smooth bark, exhaling an unpleasant odour. Leaflets 5, oval or cuneated-obovate, finely serrate, smooth; panicle 12.5-15 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 per cent alcoholic extract, add 2 drops of *lead acetate solution*; a yellow precipitate is produced.

(iii) To 2 ml of 60 per cent 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*		100g
Purified Water		400ml
Strong Alcohol		635m

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.

AGARICUS EMETICUS

(Agaric. e.)

Bot. 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 centre, surface bright red when fresh, fading to pale-red when old; cuticle easily peeled off, surface slightly sticky when young, margin prominently striate. Flesh 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 places. Taste acrid when raw but disappears when cooked.

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 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 of the Mother Tincture, four parts of Purified Water and five parts of Strong Alcohol; 3x and higher with Dispensing Alcohol.

ALSTONIA CONSTRICTA

(Alst. con.)

Bot. name : : *Alstonia constricta* F. Muell. Family : Apocynaceae

Common name : *English* : Fever bark

Description : A tall shrub or small tree up to 12m 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 exhibit 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 Pract. 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 of Purified Water and five parts Strong Alcohol. 3x and higher with Dispensing Alcohol.

ALUMINA PHOSPHORICA

(Alu. ph.)

$AlPO_4$ **Mol. wt.** 121.95

English : 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 per cent 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 *phosphates* H.P.I. Vol. I. p. 223.

Reaction : pH of a 4.0 per cent w/v suspension in *carbon dioxide free-water* should be 5.5 to 6.5.

Arsenic : Not more than 5 ppm, H.P.I. Vol. I. p. 226

Lead : Not more than 60 ppm, H.P.I. Vol. I. p. 227.

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. p. 221.

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. p. 225.

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* dropwise 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 per cent 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), p. 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, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I. 20;

Storage : Preparations below 6x should be kept in a well-closed container in a cool place.

AMMONIUM NITRICUM

(Am. nit.)

NH_4NO_3 **Mol. wt.** 80.84

Description : Colourless crystals or crystalline powder; odourless hygroscopic. Soluble in *alcohol*. Freely soluble in *water*. Contains not less than 99.5 per cent 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, p. 219 and of nitrates H.P.I., Vol. I, p. 223.

Reaction : pH of 0.05 per cent w/v solution is not less than 4.6.

Sulphated ash : Not more than 0.05 per cent.

Arsenic : Not more than 1 part per million.

Heavy metals : Not more than 5 parts per million.

Iron : 10 g complies with the *limit tests for iron*, H.P.I., Vol. I, p. 225.

Sulphate : 10.0 g complies with the *limit tests for sulphates*, H.P.I. Vol. I. p. 225.

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 produced.

Assay. : Dissolve 2.8 g in 50 ml of *water* in a 500 ml flask, add 50 ml of 1N *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 1N sodium hydroxide is equivalent to 0.08004 g of NH_4NO_3.

History and authority : Introduced by Wilmer; Allen: *Encyc. 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: 2x and higher to be triturated in accordance with the method H.P.I. vol. I, page 19. 6x may be converted to liquid 8x H.P.I. Vol. I, page 20.

AMMONIUM PHOSPHORICUM

(Am. phos.)

$(NH_4)_2 HPO_4$ **Mol. wt:** 132.07

English : Ammonium phosphate.

Description : Small colourless crystals or white granules; taste saline and cooling. Loses ammonia on exposure to air. Freely soluble in *water;* insolule in *alcohol*, and *acetone*. Contains not less than 97.0 per cent and not more than 102.0 per cent 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, page 219 and 223.

Reaction : The pH of 0.2m 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 *test for iron*.

Assay. : Weigh accurately about 0.1 g. Transfer in a 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: *Encyc. 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. p 19; 6x may be converted to liquid 8x H.P.I. Vol. I. p 20.

AMMONIUM PICRICUM

(Am. pic.)

$C_6H_6N_4O_7$ **Mol. wt.** 246.14

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 per cent of $C_6H_6N_4O_7$ with reference to the substance dried to constant weight on *anhydrous calcium chloride*.

Identification : 1. On warming with *sodium hydroxide*, ammonia is evolved which is 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 *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 0.1N *sodium hydroxide solution, using phenolphthalein* as indicator. Each ml of 0.1N *sodium hydroxide* is equivalent to 0.0246 g of $C_6H_6N_4O_7$.

History and authority : Introduced by Hale: Clarke : *A Dictionary of Pract. 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 p 19, 6x may be converted to liquid H.P.I. Vol. I p 20.

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.

ANACARDIUM OCCIDENTALE

(Anac. oc.)

Bot. 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, 2.5cm long, greenish-grey; the oleogenous 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 consistance.

The oil is dark brown viscous which dries and hardens. It is soluble in *alcohol*, *chloroform* and *petroleum ether*. It gives intense violet colour with *alcoholic ferric chloride solution*.

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 Symptoms*, Vol. I, p. 283; Clarke : *A Dictionary of Practical Mat. Med.*, Vol. I, p. 101.

Preparation : (a) Mother Tincture *ϕϕ*, 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.

ANTIMONIUM OXIDATUM

(Antim. ox.)

Sb_2O_3 **Mol. wt.** 291.50

Description : Greyish-white powder, fuses at low heat. Insoluble in *water*, soluble in *hydrochloric acid*. Contains not less than 99.0 per cent 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 per cent *potassium iodide solution* and 5 ml of *benzene*. Shake and add 1 ml of 0.2 per cent *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*, Homoeopathic Pharmacopoeia of India, Vol. I, page 221.

Sulphate : Dissolve 10 g in 10 ml of *nitric acid* and proceed as per *limit test for sulphates* Homoeopathic Pharmacopoeia of India, Vol. I, page 224.

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*, Homoeopathic Pharmacopoeia of India, Vol. I, page 229.

Arsenic : Dissolve 0.5 g in 10 ml of *hydrocholoric acid* and allow to stand for one hour, *limit for arsenic* is not more than 20 parts per million. H.P.I. Vol. I. p. 226.

Iron : Dissolve 1 g in 2 ml *hydrochloric acid* and dilute to 40 ml with *water* and proceed as directed under *limit test for iron*, Homoeopathic Pharmacopoeia of India, Vol. I, page 222.

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 bi-carbonate*. Titrate with 0.1N *iodine* is equialent to 0.007288 g of Sb_2O_3.

History and authority : Allen : *Encyclo. Mat. Med.* Vol. I, 376.

Preparation : (a) Trituration 1x,

Drug strength	1/10
Ammonium 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., p. 19. 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

ASPARAGUS OFFICINALIS

(Asp. off.)

Bot. name : *Asparagus officinalis Linn.* Family : Liliaceae

Common names : *English* : Asparagus, *French* : Asperge, *German* : Spargel.

Description : A perenial deciduous herb up to 2 m in height. Stem erect unarmed, terete branching, ultimate branches filiform, 8 to 15 mm long, cladodes 3-3 in a fascicle, 0.6 to 2.54 cm long, terete; leaf 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 per cent 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 Rf 0.05, 0.12, 0.30 and 0.35 giving blue fluoressence in UV light. On spraying with *antimony trichloride* and heating, an additional spot appears at Rf 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 *ninyhydrin reagent* and heating at 110°, two violet spots appear at Rf. 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 Rf. 0.14 and 0.25 (violet).

Distribution : Europe.

History and authority : Introduced and proved by Buchner in 1840, *Hygea XII* 426; Allen : *Encycl. of Pure Mat. Med.* Vol. I, 527; Hering; *Guiding Symptoms 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 ore part Mother Tincture, three parts Purified Water and six parts Strong Alcohol. 3x and higher with Dispensing Alcohol.

AURUM SULPHURATUM

(Aur. sul.)

Au_2S_3 **Mol. wt.** 490.20

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 200°. Contains not less than 79 per cent 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 in to two parts.

(i) To one drop of the solution in a micro-test-tube add one drop of 1 per cent *mercuric chloride solution* and one drop of 10 per cent *stamous chloride solution*. After five 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 them 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.

In soluble 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 0.1g and shake with three successive quantities of 2 ml of *ether*. Decant each time in tared vessel. Evaporate, the residue weights 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 *conc. hydrochloric acid*, and heat the solution to boiling; add 25 ml of 5 per cent *aqueous hydroquinone solution;* (3 ml for every 25 mg of Au) and boil for 30 minutes. Allow to cool and filter through 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 : *Encycl. Mat. Med.* Vol. II, page 23.

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

Aurum Sulphuratum 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, 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, page, 20.

Storage : Keep in a well-closed container, protected from light.

BARIUM SULPHURICUM

(Bar. sul.)

$BaSO_4$ **Mol. wt.** 233.43

English : Barium sulphate; *French :* Buril sulphas; *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 per cent and not more than 100.5 per cent 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 about 2 g and ignite, the loss corresponds to not more than 2.0 per cent.

Organic matters : Heat 1 g in a 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 0.62g 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 ice-bath until the precipitate settles, decant the clear liquid, filter and wash with about 10 ml of *dilute hydrochloric acid* and wash paper well with *water.* Add 100 ml *water* to the residue, 50 ml *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), p. 45.

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

Barium 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, 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, 20.

Storage : To be kept in well-closed container.

BAROSMA CRENATA

(Bar. cren.)

Bot. 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 an arc of radiate xylem with about six xylem rays. Below is narrow band of phloom, 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 schizo-lysigenous glands up to about 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, p. 125.

Preparation : (1) 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 Tincutre.

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

BENZINUM NITRICUM

(Benz. nit.)

$C_6H_5NO_2$ **Mol. wt.** 123.10

English : Nitrobenzene; *French :* Essence de mirobarue; *German :* Mirbanol.

Description : A pale yellow liquid having odour; benzaldehyde like taste sweet. Immiscible with *water*, miscible with *alcohol*, *benzene* and *ether*. It solidifies at low temperature to acicular crystals melting at about 5°. Readily volatilises with steam. Contains not less than 98 per cent 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 per cent *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 per cent distills between 209-211°.

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.)

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 per cent of Be.

Identification : (i) One drop of the solution in a *dilute acid* when treated on a spot plate with a drop of 2N *soldium 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 *per cent sodium hydroxide solution* and 0.02 *per cent 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 *per cent diammonium hydrogen phosphate solution* and a slight excess of 15 *per cent 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 6N-*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. Jour.* 43, 79, in 1953.

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

Beryllium Metallicum	100 g
Saccharum Lactis	900 g

To make one thousand grames of the Trituration.

(b) Potencies; 2x and higher to be triturated in accordance with the method p. 19, Vol. I; H.P.I. 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

BRACHYGLOTTIS REPENS

(Brac. rep.)

Bot. name : *Brachyglottis repens* Forest Family : Compositae

Description : A shrub up to 7 m in height with large broad, deeply toothed, glossy leaves, dawny on under surface. Flower-heads numerous, small, yellow in terminal panicles.

Parts used : Leaf with flower.

Microscopical : Leaf in transection dorsiventral and consists of 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 allround 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.*, X, 385; Clarke : *A Dictionary Practical Mat. Med.*, 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 : 2 × to contain one part Mother Tincture, three parts Purified Water, six parts Strong Alcohol. 3 × and higher with Dispensing Alcohol.

BRANCA URSINA

(Branca)

Bot. name : *Heracleum sphondylim* Linn. Family : Umbeliferae

Common names : *English :* Bears Breach : *French :* Berce; *German :* Gereine Barenklau.

Description : Biennial to perennial herb with a large fusiform branching root, yellowish externally, whitsh internally. Stem stout, 1 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 obcordate, about 10 mm long and nearly as wide, often pubescent.

Identification : (i) Carryout TLC of the chloroform extract on silica gel 'G' using *cyclohexane; acetone* (9 :1 v/v) as mobile phase; under U.V. light ten spots appear, at Rf 0.05 (blue), 0.10 (blue), 0.16 (blue), 0.23 (red), 0.27 (grey), 0.35 (yellow), 0.48 (blue), 0.56 (blue), 0.72 (blue) and 0.89 (blue). On spraying with *pottassium permanganate*, six spots appear at Rf 0.05 (white), 0.23 (white), 0.35 (white), 0.48 (yellow), 0.78 (greenish yellow) and 0.96 (yellow) in pink back ground.

(ii) 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 Rf 0.05, 0.10, 0.16.

Part used : Whole plant.

Distribution : Europe and North America.

History and authority : Introduced and proved by Rosenburg, *Archiv F. Hom.* 17, 46; Allen : *Encyclop. of Pure Mat. Med.* Vol. IV, 588.

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

Branca Ursina 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 to contain one part Mother Tincture, two parts Purified Water, seven parts Strong Alcohol; 3x and higher with Dispensing Alcohol.

CALCAREA MURIATICA

(Calc. mur.)

$CaCl_2$ **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 per cent 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 0.1N *hydrochloric acid* using *bromothymol blue* as indicator.

Heavy metals : Not more than 20 *parts per million*, H.P.I. Vol. I, p. 229

Iron : 4 g complies with the *limit test for iron*, H.P.I. Vol. I, p. 225.

Loss on drying : Loses not more than 10.0 per cent 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, p. 225.

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 *disodium-acetate*, using *mordant black mixture* as indicator. From the volume of 0.05 M disodium-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 Pract. Mat. Med.* Vol. I, 357.

Preparation : (a) Trituration 1×, Drug strength 1/10

Calcarea Muriatica	100 g
Saccharum Lactis	900 g

To make one thousand milligrammes of the Trituration.

(b) Potencies : 2x and higher to be triturated in accordance with the method H.P.I. p. 19.6x may be converted into liquid 8x, H.P.I. Vol. I, p. 20.

CALTHA PALUSTRIS

(Cal. pal.)

Bot. name : *Caltha palustris* Linn. Family : Ranunculaceae

Common names : *English :* Marsh marigold; *French:* Populage Soucideau; *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 elongagted peduncles. Sepals elliptic to obovate. Anthers liner-oblong or lace-oblong, about 2 mm long. Follicles 4 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 per cent alcohol, evaporate the extract on water-bath and extract the residue with *chloroform.* Carry out TLC on silica gel 'G' using *chloroform : methanol* (9 : 1 v/v) as mobile phase. Under U.V. light four spots appear at Rf. 0.11 (green), 0.36 (blue), 0.50 (yellow) and 0.88 (blue) with fluorescence.

Distribution : India in Himalayas at high altitudes; North America, Canada and temperarate Asia.

History and authority : Allen : *Encyclop. of Pure Mat. Med.* Vol. II, 421.

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

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.

CHAMOMILLA

(Cham.)

Bot. name : *Matricaria chamomilla* Linn — **Family : Compositae**

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; desk or tubular florets perfect and without papus; ray or ligulate florets from 10 to 20 pitillate; 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 upto 25μ in diameter with prominent conical projections of outer wall and 3 pores, papillose fragments of stigmas, the upper end being papillae; fragments of collapsed parenchyme; fragments of fibrovascular bundles with spiral annular and reticulate tracheae and sclerenchyma fibers; fragments of involucral bracts with epidermis having elliptical stomata up to 30μ in length, also tracheae and fibers; fragments of achene tissue with epidermal cells having scalariform markings or wavy longitudinal walls and parenchyme 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 plat 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 Despensing Alcohol.

CHLOROFORMUM

(Chlorf)

$CHCl_3$ **Mol. wt.** 119.4

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 per cent *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 1 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, 218.

Boiling point : 61°

Acidity : Shake 10 ml with 20 ml of freshly boiled and cooled *water* for three 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, p. 369; Allen : *Encyclop. of Pure Mat. Med.* Vol. III, 263; Hearing : *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)

Cl_2 **Mol. wt.** 71.9

English : Chlorine; *French :* Chlore; *German :* Chlor.

Description : Chlorum is a greenish-yellow, clear chlorine water containing at least 0.4 per cent of chlorine having suffocating odour.

Identification : (i) It gives reaction characteristic of *Acidum hydrochloricum*, H.P.I., Vol. I, 35.

(ii) When treated with *potassium iodide solution*, it evolves iodine.

Arsenic : Not more than 1 part per million, H.P.I., Vol. I, 226.

Lead : Not more than 5 parts per million, H.P.I., Vol. I, 227.

Residue on evaporation : Leaves not more than 0.001 per cent 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, p. 165; Allen : *Encyclop. of Pure Mat. Med.* Vol. IV, 102.

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

Chlorum containing 0.4 per cent 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.)

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. It consists of 70 to 85 per cent of anthraquinone derivatives. Brownish-yellow to orange-yellow, microcrystalline powder; odourless; tasteless. Very slightly soluble in *water*, slight soluble in *alcohol*.

Identification : (i) Dissolve 0.1 g in 5 ml of *potassium-sodium hydroxide solution*, a dark brownish-red solution is 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 per cent.

History and authority : Boericke : *Homoeopathic Materia Medica* and *Repertory* 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, 19 ; 6x may be converted to liquid potency 8x, H.P.I. Vol. I, 20.

CINERARIA MARITIMA

(Cin. mar.)

Bot. name : *Senecio cineraria* D.C. Family : Compositae

Synonym : *Cineraria maritima* Linn.

Common name : *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 cyme. 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 unicelluluar 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 thickenings on outer tangential walls. Trichomes numerous, uniseriate, whip-like forming a web-like covering on epidermal cells. Collenchyma 6 to 7 layered at the ridges;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 succuss 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 Rf 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;* evaporte combined chloroform extract and dissolve it in 10 ml 0.1N *hydrochloric acid.* Titrate the excess *hydrochloric acid* with 0.1N *sodium hydroxide.* Each ml of 0.1N *hydrochloric acid will be* equivalent to 0.0134 mg. Total alkaloid with reference to senacelonine should not be less than 0.085 per cent weight by volume.

Distribution : Mediterranean region. Aiso being cultivated in India.

History and authority : Boericke : *Mat. Med. and Repertory*; 9th Ed., 210; Clarke : *Dictionary of practical Mat. Med.* Vol. I, 525.

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

Cineraria Maritima	100 g
Purified Water	400 ml
Strong Alcohol	635 ml

To make one thousand millilitres of the Mother Tincture.

(b) Potencies: 2 × to contain one part Mother Tincture, three parts Purified Water, six parts of Strong Alcohol; 3 × and higher with Dispensing Alcohol.

II. : Succus :

Extracted juice	87 per cent
Strong Alcohol	8 per cent
Glycerine	5 per cent
Phenyl mercuric nitrate	0.0001 per cent.

COCAINUM MURIATICUM

(Coca. mur.)

$C_{17}H_{21}NO_4HCl$ **Mol. wt.** 339.81

English : Cocaine hydrochloride

Description : Colourless crystals or white crystalline powder; hygroscopic. Odourless; taste bitter and numbing. Very soluble in *water*. Freely soluble in *alcohol* and *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*, and 5 ml of *solution of potassium permangnate* and stir briskly for some time; 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 per cent w/v solution, —70° to 72°.

Loss on drying : Loses not more than 1.0 per cent of its weight when dried over *phosphorus pentoxide* for three hours.

Sulphated ash : Not more than 0.1 per cent.

History and authority : Boericke: *Materia Medica with Repertory*; Allen: *Encyclop. Mat. Med.* Vol, III, 369; Hering ; *Guilding* 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. 6x may be converted into liquid 8x, H.P.I., Vol. 1. p. 20.

Storage : Preparations below 6x to be kept in well-closed containers.

Caution : Not to be dispensed below 3x.

COMOCLADIA DENTATA

(Com. dent.)

Bot. 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 odd 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 30 per cent *alcohol*, evaporate 20 ml of the extract and extract the residue with *chloroform* and separate the two layers.

(i) 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 Rf. 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 Rf 0.82 (blue fluorescence).

(3) To 1 ml of the extract add 1 drop of 5 per cent *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. of Pure 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.

CURCUMA LONGA

(Curcuma)

Bot. name : *Curcuma longa* Linn. Family : Zingiberaceae

Common name : *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 and often short branched (long turmeric); the round form half as broad as long, the long form, 2.5 cm long and 1to1.8 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 dumbel-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 12 μ. Transverse sections 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, 3 parts of Purified Water and 6 parts of Strong Alcohol. 3x and higher with Dispensing Alcohol.

CYPRIPEDIUM PUBESCENS

(Cypr. pub.)

Bot. name : *Cypripedium pubescene* Willd. Family : Orchidanceae

Synonym : *Cypripodium luteum*

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 Dict. of Mat. Med.* Vol. I, 653; Hering : *Guiding Symptoms,* Vol. 5, 78.

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

Cypripedium Pubescens in *coarse powder*	100 g
Purified Water	400 m
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 MYOPORIDES

(Dub. myop.)

Bot. 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-lanceoplate, 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; mid-rib prominent on both surfaces, lateral veins anastomosing near the margin, which is entire and slightly revolute; apex acute or some-times 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 upper 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 medula 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 78μ into 16 to 20μ, thick walled, cuticularised, striated epidermal cells 32 to 64μ into 28 to 40μ, anisocytic stomata 16 to 20μ diameter. Palisade cells 20 to 28μ in dia meter, spiral vessel 8 to 12μ in diameter. Palisade ratio 1.25 to 1. 5; stomatal number 10 to15 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 per cent *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 sports appear at Rf. 0.55, 0.72 and 0.84. Three more spots appear on standing after 24 hrs. at Rf. 0.07, 0.19, and 0.34. Spots at Rf. 0.19 and 0.55 correspond with hyoscyamine and hyoscine respectively.

Distribution : New South Wales and Queensland, Australia, New Calendania.

History and authotity : 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, p. 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)

Bot. name : *Epiphagus virginiana* (L) 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 brown-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 stripes of brown-purple. Capsule somewhat oblique, about 5 mm long, dehiscent across the top.

Part used : Whole plant.

Identification :

(i) To 1 ml of the 60 per cent alcoholic extract, add two drops of *lead acetate solution;* a cream coloured solution with turbidity is formed.

(ii) To 2 ml of the alcoholic extract, add two drops of *copper sulphate solution;* a green colour is produced.

(iii) 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, p. 706.

Preparation :

(a) Mother Tincture ϕ, Drug strenth 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.)

Bot. name : *Euphorbia corollata* Linn. Family : Euphorbiaceae.

Synonyms : *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. Leaves 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 auxillary 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 per cent *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 Rf 0.59, 0.82 and 0.96. After spraying with *antimony trichloride solution* and heating, six spots appear at Rf. 0.07 (pink), 0.17 (yellowish-brown), 0.51 (pink), 0.82 (brown), 0.88 (pink) and 0.93 (pink).

Distribution : North America.

History and authority : Proved by Hale, *H. Am. Journ. of Hom.* 11, 49, 1862; Allen : *Encyclop. of Pure 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. p. 91; Allen: *Encyclop. Pure Mat. Med.*, IV, 266; Clarke : *A Dictionary of Practical Mat. Med.*, 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.)

Fe_3O_4 **Mol. wt.** 231.55

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, p. 222.

(2) Possesses magnetic property.

Assay : Dissolve about 0.5 g accurately weighed in 20 ml of *dilute hydrochloric acid*, and 10 ml of *potassium iodide solution* and keep in dark for fifteen minutes; titrate the liberated iodine with 0.1N *sodium thiosulphate* using *starch* as indicator until the solution becomes colourless. Each ml of 0.1N 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 : *Encycl. of Pure Mat. Med.* Vol. X, 522; Clarke : *A Dict. of Pract. 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, p. 19. 6x may be converted into liquid 8x, H.P.I. Vol. I, page 20.

GAULTHERIA PROCUMBENS

(Gal. proc.)

Bot. 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. Berry bright red, 7 to 10 mm in diameter.

Part used : Leaf.

Microscopic : 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 strand; 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 : *Encylcop. Mat. Med.*, Vol. IV, 384; Clarke : *A Dictionary of Pract. Mat. Med.*, Vol. I, p. 804.

Preparation : (a) Mother Tincture ϕ.

	Drug strength	1/10
Gaultheria Procumbens in *coarse powder*		100 g
Purified Water		215 ml
Strong Alcohol		315 ml

To make one thousand millilitres of the Mother Tincture.

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

GENTIANA CRUCIATA

(Gent. c.)

Bot. 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 per cent *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 Rf. 0.98 (brown), 0.94 (pink), 0.71 (dark blue), 0.40 (pink), 0.34 (pink), 0.21 (pink).

(i) 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 Rf. 0.86, 0.71, 0.56 (all yellow).

(ii) 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 Rf. 0.31, 0.56, 0.66 (all brown).

(iii) 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 Rf. 0.81.

Distribution : North & 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); Allens : *Encyclop. Mat. Med.*, Vol. IV, 404; Clarke : *A Dictionary of Pract. 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.)

Bot. name : *Gratiola officinalis* 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.

Description : Central Europe, North America and Extra-tropical Australia.

Microscopical : Stem : ridged and furrowed in outline. Epidermic single layered with sinuous radically elongated cells; cortex parenchymatous with large intercelluar spaces; endodermis distinct, single layered; pericycle of isolated strands of sclerenchyma fibres; phloem small; xlyem 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 15-100 μ by 9-56 μ, elongated, being rectangular up to 120 μ by 4 μ, hexagonal 46-88 μ by 28-40 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.

History and authority : Introduced and proved by Nenning, Hartlaub and Trinks, *Reine Arzenim* 2, p.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.)

Bot. name : *Heaera helix* Linn. Family : Araliaceae

Synonyms : *Hedera nepalenis* Koch; *H. himalaica* Tabler.

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; vasculur bundle in a ring; conjoint collateral, open with sclerenchymatous pericycle in patches above phloem; primary bundles distinct; secretary ducts numerous, scattered in cortex and pith parenchyma. Pericycle absent in stem branches from young twings.

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; secretary ducts scattered in cortical region; pith parenchymatous. Secretary ducts mostly absent in petiole of young leaves.

Leaf: epidermis single layered; collenchyma below the upper epidermis; mesophyl not well differentiated into palisade and spongy parenchyma; stomata on lower aspect only. Midrib with papillose epidermis, followed by 3 to 4 layered collenchyma and ground tissue of thick walled lignified cell; secretary 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 and the ground tissue is 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 and Europe, and from W. Asia to Japan.

History and authority : Introduced by Hahnemann, *Apotheker-Lexiken*, Leipzig I, 274 (1793); proved by Mazger, *Hom. Arznil*, 346 (1951). English translation by Whitmont and Stephenson, *Jou. Amer Instt. Hom.*, 51, 74, (1958).

8—1 M of HFW/ND/86

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.)

Bot. name : *Helianthus annus* Linn. Family : Compositae

Common names : *Hindi :* Suraj Mukhi; *English :* Sunflower; *French :* Grand-soleil, *German :* Sonnenblume.

Description : An annual herb with erect, rough, hairy stem, up to 3 m high. Leaves 10-30 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 florets yellow, surrounding a brown purple centre of discflorets; 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 in 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 m
Strong Alcohol	537 ml

To make on 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.)

$C_{17}H_{23}NO_3\frac{1}{2}H_2SO_4$ **Mol. wt.** 338.4

English : Hyoscyamine hemi sulphate.

Description : White odourless, crystalline powder; taste bitter. Freely soluble in *water* and *alcohol*. Contains not less than 98.0 per cent and not more than equivalent of 101.0 per cent of $C_{17}H_{23}NO_3\frac{1}{2}H_2SO_4$ 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 per cent w/v *alcoholic potassium hydroxide solution*; purple colour appears.

(ii) Yields reaction characteristic of *sulphates* H.P.I. Vol. I., page 224.

(iii) I Carryout TLC of a 1 per cent w/v solution, in 2N *acetic acid* 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 Rf. 0.4.

Melting range : 206-212° after drying at 100°.

Reaction : 1 per cent 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 $C_{17}H_{23}NO_3\frac{1}{2}H_2SO_4$.

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, p. 19. 6x may be converted into liquid 8x, H.P.I. Vol. I., page 20.

IODOFORMUM

(Iodof.)

CHI_3 **Mol. wt.** 393.73

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 per cent 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 filtrate 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, p. 225.

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, p. 225.

Ash : Not more than 0.2 per cent, H.P.I. Vol. I, p. 230.

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., p. 116; Hering : *Guiding Symptoms*, Vol. VI., p. 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., p. 19. 6x may be converted to liquid 8x, H.P.I., Vol. I., p. 20.

Storage : All preparations below 6x to be kept in well-closed containers protected from light.

JUNCUS EFFUSUS

(Juncus)

Bot. 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, cylinderical containing soft spongy pith, and at base short leaflets or leaf bearing sheaths. Culms contain sub-epidermal sclerenchyma strands or girders. Flowers numerous, greenish, in a sessile spreading panicle protruding from the side of scape, anthers three, white, as long as filaments. Seeds yellowish, about 6 mm long.

Part used : Rhizome.

Identification : Take 10 g, extract with 100 ml of 60 per cent *alcohol*. Evaporate 20 ml of the extract on water bath. Extract the residue with *chloroform* and separate the two layers. (i) Carry out T.L.C. of chloroform extract on silica gel 'G' using *benzene : methanol* (95 : 5 v/v) as mobile phase. Seven spots appear under UV light at Rf. 0.04 (blue), 0.18 (blue); 0.26 (blue); 0.35 (yellowishblue); 0.41 (blue); 0.74 (blue) and 0.85 (bright blue). On spraying with *antimony trichloride* it gives six spots having Rf. 0.09 (blue); 0.22 (blue); 0.56 (blue); 0.70 (reddish changes to violet); 0.75 (brown) and 0.81 (browa). (ii) Carry out T.L.C. 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 fluoresceace having Rf. value 0.18 changes to yellow. (iii) Carry out T.L.C. of the 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 Rf. 0.70.

Distribution : North temperate and arctic zones.

History and authority Proved by Wahle, *Archiv S : Hom. Heill* XIX, 2, p. 183; Allen : *Encyc. Mat. Med.* V. p. 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 Powder	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.

KALI CHROMICUM

(Kali chr.)

$K_2Cr\ O_4$ **Mol. wt. 194.20**

English : Potassium chromate.

Description : Lemon-yellow crystals; freely soluble in *water*, insoluble in *alcohol*. Contains not less than 99.0 per cent 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, page 224.

(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., p. 229.

Sulphate : 5 g complies with the *limit test for sulphates*, H.P.I., Vol. I., p. 226.

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 ten 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 $K_2Cr\ O_4$.

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, p. 19. 6x may be converted to liquid 8x, H.P.I., Vol. I, p. 20.

LITHIUM BENZOICUM

(Lith. ben.)

$C_7H_5O_2Li$ **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 per cent of $C_7H_5O_2Li$ calculated with reference to the substance dried to constant weight over *silica gel*.

Identification : (i) 10 per cent aqueous solution gives buff coloured precipitate with *ferric chloride solution*.

(ii) With *dilute hydrochloric acid* yields; a white crystaline precipitate of benzoic acid which has m.p. 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 45-50° for 15-20 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 gm 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, p. 19. 6x may be converted to liquid 8x, H.P.I., Vol. I, page 20.

LOBELIA CARDINALIS

(Lob. card.)

Bot. name : *Lobelia cardinalis* Linn. Family : Lobeliaceae

Synonyms : *Lobelia cocirnes, Trachelium americanum*

Common name : *English :* Cardinal-flower.

Description : A deciduous perennial herb, erect, usually branched. Stem stout, smooth or short pubescent. Leaves thin, lanceolate to oblong up to 16 cm long and 5 cm wide, 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.

Identification : Take 10 g, extract with 100 ml of 50 per cent *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) Distill 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.

Part used : Whole plant.

Distribution : North America, 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.)

Bot. name : *Lolium temulentum* Linn. Family : Poaceae

Synonyms : *Lolium arvense, 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; Spiklets 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 wheat fields.

History and authority : Introduced and proved by Wierius, Seeger, 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 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.

LYCOPERSICUM ESCULENTUM

(Lyco. es.)

Bot. name : *Lycopersicum esculentum* Mill. Family : Solanaceae

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 is 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 bicollateral 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 some times with cusparian strips on the walls

Leaf : Walls of single layered upper epidermis, much less sinuous than those of lower epidermis, stomata anomocytic, 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 cusparian 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, p. 627; Clarke : *A Dictionary of Mat. Med.*, Vol. II, p. 325.

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

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.)

Bot. name : *Hippomane mancinella* Linn. Family : Euphorbiaceae

Common names : *English :* Manchineel; *French :* Mancenillier Veneneux; *German :* Manschinapfel.

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 ensheathed by a single layered sclerenchymatous bundle sheath with adaxial and abaxial extensions, sometimes with transcurrent 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 gap between the ends of the abaxial arc; modullary 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, 20-28 μ by 12-28 μ.

Petiole : Circular in outline with single layered epidermis of dumbel-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. Centre 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 Pract. 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.)

$MnCl_2.4H_2O$ *Mol. wt.* 197.91

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 of 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 0.1N *silver nitrate*. Titrate excess of *silver nitrate* with 0.1N *Ammonium thiocyanate* using *ferric ammonium sulphate* as indicator. Each ml. of 0.1N silver nitrate is equivalent to 0.009895 g of $Mn\ Cl_2.\ 4H_2O$.

History and authority : Proved by Lemicke *N.Z.F.H.Kl.*, (2) 28; Allen: *Encyclop. Mat. Med.*, Vol. VI, 165; Clarke : *A Dictionary of Pract. Mat. Med.* Vol. *II*, 406.

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

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.)

MnO_2 *Mol. wt.* 86.94

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 per cent MnO_2, calculated with reference to the substance dried to constant weight at 105°.

Identification : (i) To 10 ml of 5 per cent 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 *pieric acid*, boil gently for a few minutes, dilute with about 100 ml of *water* and filter; the filterate 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 0.1N 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 : *Encyc. of Pure. Mat. Med.* Vol. VI, 166; Clarke : *A Dictionary of Pract. Mat. Med.* Vol. II, 407.

Preparation : (a) Trituration 1x,

	Drug strength	1/10
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, 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, 20.

MERCURIUS ET KALI IODATUS

(Merc. ki)

$HgI_2 2KI$ *Mol. wt.* 786.48

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 per cent and not more than equivalent of 102 per cent 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 *ferrous sulphate*, titrate with 0.1N *ammonium thiocyanate*, using *ferric ammonium sulphate* as indicator. Each ml of 0.1N ammonium thiocyanate is equivalent to 0.07864 g of $HgI_2 2KI$.

History and authority : Introduced by Hale; Clarke : *A Dictionary of Pract. 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, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20.

MERCURIUS NITRICUS

(Merc. nit.)

$Hg(NO_3)_2$ *Mol. wt.* 324.66

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 per cent of $Hg(NO_3)_2$ with reference to the substance dried to constant weight over siliga gel.

Identification : (i) *Solution of soddium 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 2.0 g with *sulphuric acid* and ignite; not more than 1 mg of residue is obtained.

Assay : Dissolve about 0.5 g accurately weighed in 100 ml of *water* containing 5 ml of *nitric acid*. Titrate with 0.1N *ammonium thiocyanate* using 5 ml of *ferric ammonium sulphate* as indicator. Each ml of 0.1N 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, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20.

NARCOTINUM

(Narcot.)

$C_{22}H_{23}NO_7$ **Mol. wt.** 413.40

English : Narcotine; *German :* Dejrosnesches Salz.

Description : An alkaloid obtained from opium. It occurs as a fine, almost white odourless, tasteless crystaline 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 per cent 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 per cent w/v solution in *methyl alcohol* containing 0.4 per cent 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 is about 3.13.

Melting point : 174°—176°.

Morphine : Dissolve 0.10 g in 10 ml of *N*/10 *hydrocholric 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 per cent of its weight

Sulphated ash : Not more than 0.1 per cent.

Assay : Take about 0.5 g accurately weighed carrying out non-aqueous titration. Each ml of 0.1N 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, p. 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, 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, 20.

Storage : Preparations below 6x to be kept in well-closed containers.

NATRUM BROMATUM

(Nat. brom.)

Mol. wt. 102.91

Na Br.

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 *sodicm* and of *bromides*, H.P.I Vol. I page 224.

Arsenic : Not more than 2 parts per million, Homoeopathic Pharmacopoeia of India, Vol. I, page 226.

Barium : Dissolve 0.5 g in 10 ml of *water* and add 1 ml of *dilute sulphuric acid;* no turbidity is produced within five minutes.

Iron : 0.5 g complies with the *limit test for iron* H.P.I. Vol. I, p. 225.

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 one minute, maintaining the temperature at 105°. Remove the source of heat and pass a brisk stream of air for ten minutes. Add 5 ml of 0.1N *silver nitrate* and 5 drops of *nitro-benzene* and shake. Titrate the excess of silver nitrate with 0.1N *ammonium thiocyanate*, using solution of *ferric ammonium sulphate* as indicator, and shaking vigorously near the end point; not less than 3.7 ml of 0.1N *ammonium thiocyanate* is required.

Sulphate : 2 g, complies with the *limit test for sulphates*, Vol. I, P. 225.

Alkali : Dissolve 5 g in 50 ml of freshly boiled and cooled *water* and add 0.2 ml 0.1N *sulphuric acid;* no colour is produced on the addition of a drop of *solution of phenolphthalein*.

Loss on drying : Loses not more than 5 per cent 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 0.1N *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 0.1N silver nitrate is equivalent to 0.0119 g of NaBr.

History and authority : Introduced by Laborde, Archif de physiol, 1869 *A.H.Z.*, 87, p. 46 Allen : *Encyclop. Mat. Med.*, Vol. VI, 498.

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

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, p. 19. 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

NATRUM CHLORATUM

(Nat. chl.)

$NaClO_3$ **Mol. wt.** 106.45

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 per cent 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 page 224.
(ii) To 100 mg add 5 ml *water* and 2 ml 5 per cent *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 millon.

Chloride : Not more than 100 parts per million.

Sulphate : Not more than 100 parts per million.

Heavy metals : Not more than 50 parts per 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 per cent *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 Edition, 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, 19. 6x may be converted to liquid 8x, H.P.I. Vol. I, 20.

Caution : Keep out of contact with organic matter and other oxidisable substance.

NATRUM IODATUM

(Nat. iod.)

NaI

Mol. wt. 149.9

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 per cent 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, 224 and *iodide* H.P.I. Vol. II, 221.

Arsenic : Not more than 2 parts per million; H.P.I. Vol. I, 226.

Sulphate : 1.0 g complies with the *limit test for sulphates*, H.P.I. Vol. I, 226.

Lead : Not more than 10 ppm; H.P.I. Vol. I, 227.

Loss on drying : When dried to constant weight at 105° loses not more than 5.0 per cent 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 g 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 *amaranth 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 strength	
Natrum Iodatum		1/10
Saccharum Lactis		100 g
		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.

NATRUM SILICATUM

(Nat. sil.)

$Na_2SiO_5H_2O$

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 per cent 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 35.0 per cent and not more than 50.0 per cent 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 per cent *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 *conc. hydrochloric acid*; add 75 ml *water* and heat on steam-bath for 10 to 20 minutes. Filter and wash the precipitate with 5 per cent *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 desicator and weigh. Each g of residue will be equivalent to 3.534 g of $Na_2SiO_35H_2O$.

History and authority : Introduced by Kent: *New Remedies* (Indian Ed. 1963), p. 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, 19; 6x may be converted to liquid 8x, H.P.I. Vol I, 20.

NATRUM SULPHUROSUM

(Nat. sulph.)

$Na_2SO_3.\ 7H_2O$ **Mol. wt.** 252.18

English: Sodium sulphite; *French*: Sulfite de soude; *German*: Schwefelsaures 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 per cent 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 1 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 Pract. 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, page 19. 6x may be converted to liquid 8x, H.P.I., Vol. I, page 20.

NICCOLUM CARBONICUM

(Nic. Carb.)

$NiCO_3 . 2Ni(OH)_2 . 4H_2O$ **Mol. wt.** 342.13

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 per cent nickle with reference to substance dried to constant weight at 105°.

Identification : (i) To 1 g add a few drops of *hydrochloric acid* effervescences 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 per cent *ethanolic solution of dimethyl glyoxime*, 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-glyoxime* (1 per cent solution in alcohol) and immediately add *dilute ammonia solution* dropwise 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 one 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, p. 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, 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20.

Note— Instead of 100 g pure nickel carbonate 300 g of hydrated nickel carbonate should be taken to equivalate 100 g of nickel carbonate the main drug used in Homoeopathy.

NICCOLUM METALLICUM

(Nic. met.)

Ni **At. wt.** 58.70

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 acids*, readily attacked by *nitric acid*. Contains not less than 99.5 per cent Ni.

Identification : (i) 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 *conc. hydrochloric acid*, dilute with *water* and add 15 ml of 5 per cent *dimethyl glyoxime (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 crucibles 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*; Annelon, 3, p. 353, Allen: *Encyclop. of Pure Mat. Med..*, Vol. VI, p. 633; Hering : *Guiding Symptoms* Vol. VIII, p. 35.

Preparation : (a) Trituration 1x,

	Drug strength	1/10
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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

NYMPHAEA ODORATA

(Nym. odo.)

Bot. 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 per cent *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, p. 127; Clark; *A Dictionary of Practical Mat. Med.*, Vol. II, p. 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.)

Bot. name : *Oenanthe crocata* Linn. Family : Umbelliferae

Synonym : *Oenanthe apiifolia* 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 entirely sheathing. Flowers 2 mm diameter with outer petals unequal, in umbels 5 to 10 cm diameter. Bracts and bracteoles many, caducous linear-lanceolate. Fruit 4-6 mm, cylindrical; style 2 mm erect. Roots taste, sweet but poisonous and contains yellow juice when fresh.

Part used : Root.

Distribution : Great Britain and British Islands, Ireland, Spain, France, Belgium & Portugal.

Identification : Carry out TLC of an alcoholic extract using *benzene : methanol* (9 : 1) as mobile phase; four spots are observed at Rf 0.12, 0.28, 0.33 (brownish) and 0.42 (violet) after spraying with *antimony trichloride solution* and on heating at 105° for 15 minutes.

History and authority : Introduced by Ray, *Phillos Trans.* 1699, Archiv XIV 2, 188 in (1834); Allen: *Encyclop. of Pure Med.* Vol. VII, 128; Hering: *Guiding Symptoms* Vol. VIII, 182.

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

Oenanthe Crocata in *coarase 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.)

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 acia*, rapidly in presence of *ammonium sulphate*. Contains not less than 99.5 per cent 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 diiodide.

(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 20 ppm, H.P.I., Vol. I, 225.

Lead : Not more than 10 parts per million, H.P.I. Vol. I, 227.

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 1N *sodium hydroxide solution* using *bromocresol green* as indicator. Add 5 ml of 0.1 N *hydrochloric acid*, 0.2 g of *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* 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 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 Pract. Mat. Med.* Vol. II, 711.

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

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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

PASTINACA

(Pastin)

Bot. name : *Pastinaca sativa* Linn. Family : Umbelliferae

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.

Microscopical : Consists of cortex of large amyliferous phloem parenchyma, xylem often diarch sometimes triarch. Oil ducts in the pericycle and prinary phloem are relatively ephemeral.

Part used : Root.

Identification : Take 10 g, extract with 100 ml of 70 per cent *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 Rf 0.75, 0.66, 0.46, 0.39 and 0.31 (blue fluorescence); on spraying it with saturated solution of *antimony trichloride* in *chloroform*, four spots appear at Rf. 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, p. 291.

Preparatin : (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.)

Bot. name : *Paullinia pinnata* Linn. Family : Sapindaceae

Synonym : *Serjania curassavia*, Radlk.

Common name : *English*: Winged-leaved paullinia.

Description : An evergreen climbing shrub with pennuncular 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 per cent ethanolic extract on water-bath to remove alcohol. Extract it with *chloroform*.

(i) 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 Rf. 0.09 0.23, 0.25, 0.33 and 0.74 and on spraying with *antimony trichloride* gives nine spots, having Rf. 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 Rf. 0.67 and 0.83 are light in colour).

(ii) 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 Rf. value 0.63 develop.

(iii) The alcoholic solution reduces *ammonical silver nitrate*.

(iv) 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. of Pure Mat. Med.* Vol. VII, 292.

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

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.

PHELLANDRIUM AQUATICUM

(Phel. aq.)

Bot. name : *Oenanthe phellandrium* Lanks. Family : Umbellifarae

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 indicates 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. of Mat, Med.* Vol. VII, 335; Clarke: *A Dictionary of Pract. Mat. Med.* Vol. III, 757.

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

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)

$C_{30}H_{34}O_{13}$ **Mol. wt.** 602.27

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 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 hyaroxide 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 per cent.

History and authority : Introduced and proved by Henry, *Amor. Obs.* XV, 1878, 16; Allen : *Encyclop. of Pure Mat. Med.* Vol. X, 617; Clarke: *A Dictionary of Pract. 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, p. 19, 6x to be converted to liquid 8x H.P.I., Vol. I, p. 20.

PILOCARPINUM MURIATICUM

(Pil. mur.)

$C_{11}H_{16}N_2O_2$, HCl **Mol. wt.** 244.70

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 the two layers. The benezene layer turns bluish-violet and the aqueous layer remains yellow. It gives the characteristic test of *chloride*.

Ash : Not more than 0.1 per cent.

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 strength 1/10

Pilocarpinum Muriaticum	100 g
Saccharum Lactis	900 g

To make one thousand grammes of Trituration.

(b) Potencies : 2x and higher to be triturated in accordance with the method H.P.I., Vol. I, p. 19, 6x to be converted to liquid 8x, H.P.I., Vol. I, 20.

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.)

Bot. 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 pictureque 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, somewhat 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; pholem of sieve tubes, parenchyma, but no companion cells; medullary rays 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 respirtory cavity; 1 to 3 layers of hypodermis interrupted by the stomata. Mesophyll of thin walled polygonal or irregular cells containing abundent 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 concists 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 Pract. 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.)

$H_2PtCl_6.6H_2O$ **Mol. wt.** 517.80

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 platinum metal in *aqua regia*. The solution is 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 per cent w/v solution, add 2 ml of 10 per cent 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 per cent w/v solution with 5 ml of *water* and add 1 ml of *barium chloride solution*; no turbidity or precipitate develops within one 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. of Pure Mat. Med.* Vol. VII, 589; Clarke: *A Dict. of Pract. 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, p. 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, 20.

(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)

$Pb(CH_3CO_2)_2 . 3H_2O$ **Mol. wt.** 379.34

English: Lead acetate; *French*: Acetate de plomb; *German*: Essigsures Bleioxyd, Bleizucker.

Description : Small, white, transparent, monoclinic prisms or heavy, crystalline masses; odour acetous; taste, sweet and astringent. Efflorescent in warm air. Becomes basic when heated. Freely soluble in *water* and *glycerol*, sparingly soluble in *alcohol*. Contains not less than 99.5 per cent and not more than the equivalent of 104.5 per cent of $C_4H_6O_4Pb . 3H_2O$.

Identification : Yields the reaction characteristics of *lead*, H.P.I., Vol. I, 222, and of *acetates*, H.P.I. Vol. I, 219.

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, 225.

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 Pract. Mat. Med.* Vol. III, 855; Hering: *Guiding Symptoms:* Vol. VIII. 475.

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

Plumbum Aceticum	100 g
Purified Water in sufficient quantity	
To make one thousand millilitres of Mother Solution.	

(b) Potencies : 2x with Dilute Alcohol; 3x and higher with Dispensing Alcohol.

(c) Trituration 1x, Drug strength 1/10

Plumbum Aceticum	100 g
Saccharum Lactis	900 g
To make one thousand grammes of Trituration.	

(d) Potencies : 2x and higher to be triturated in accordance with the method, H.P.I. Vol. I, page 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, page 20.

Caution : All preparation below 3x to be freshly made.

PLUMBUM CHROMICUM

(Pb. ch.)

$PbCrO_4$ **Mol. wt.** 323.22

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 per cent of the substance dried to constant weight at 105°.

Identification : (i) Yields reactions characteristic of *lead*, H.P.I. Vol. I, 222 and for *chromates*.

(ii) Dissolve 0.1 g in 1 ml of 50 per cent *sulphuric acid*, add 1 ml of a 1 per cent *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 per cent *sodium hydroxide solution*. Add 2.5 g of *potassium iodide*, 100 ml of *hydrochoric acid*. Keep in dark for five minutes. Titrate the liberated iodine with 0.1N *sodium thiosulphate*, using *starch* on as indicator. Each ml of 0.1 N *sodium thiosulphate* is equivalent to 0.01077g 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. Medica*, Vol. III, 864.

Preparation : (a) Trituration 1x,

	Drug strength	1/10
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, p. 19. 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

POPULUS TREMULOIOES

(Pop. trem.)

Bot. 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 base, finally conate; petiole long, slender. Catking 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: *Encylop. of Mat. Med.* VIII, 154; Clarke : *A Dictionary of Pract. Mat. Mea.*, Vol. III, 881.

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

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.)

Bot. name : *Prunus padus* Linn. Family : Rosaceae

Common name : *English:* European bird cherry; *German :* Ahlkersch

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. Recemes loose and often dropping, 8 to 10 cm long with white odorous flowers; pedicles 10 to 15 mm long; sepals ovate, oblong, 2mm long, petals 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 per cent *alcohol*; evaporate and extact the residue with *chloroform*.

(i) 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 Rf 0.92 (light red), 0.55 (pink), 0.35 (blue), 0.25 (light blue).

(ii) Take 0.5 ml of the extract, dilute it with 0.5 ml of *methanol* and add one drop of 5 per cent *aqueous ferric chloride*; greenish colour is observed.

Distribution : Native of Europe, also found in India and temperate Asia to Korea and Japan.

History and authority : Proved by Lembka, *All Homzeit* 45, 368; Allen : *Encyl. of Pure Mat. Med.* Vol; VIII, 156; Clarke : *A Dictionary of Pract Mat. Med.* Vol. III, 886.

Preparation : (a) Mother Tincture ϕ,

	Drug strength 1/10
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 Dispensing Alcohol.

PYRUS

(Pyrus)

Bot. 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 to narrowly oblong, long accuminate, 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; potals 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 per cent *alcohol;*

(i) Carry out Thin Layer Chromatography of the extract over silica gel 'G' using n-*butanon; acetic acid: water* (4 : 1: 1) (v/v) as mobile phase; on exposure to *iodine vapour* five spots appear at Rf. 0.50, 0.72, 0.81, 0.91 and 0.95.

(ii) 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 per cent *methanolic sulphuric acid* as spray reagent. Two brown coloured spots appear at Rf. 0.58, and 0.83 after heating the plate.

(iii) 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, 1878; Allen : *Encyclop. of Pure Mat. Med.* Vol. X, 623; Clarke : *A Dictionary of Pract. 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.)

$Ra\ Br_2$ **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. Radio active.

Specific gravity : 5.79

History and authority : Proved by Diffenbach; Boericke; *Mat. Med. with Repertory*, p. 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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

Caution : 1. Radio-active, powerful corrosive, effect on skin. Handle with care.

2. Poison ! Not to be dispensed below 6x.

Storage : Glass bottles or sealed tubes enclosed in leadsheet.

RANUNCULUS ACRIS

(Ran. acri.)

Bot. name : *Ranunculus acris* Linn. Family : Ranunculaceae

Common names : *English :* Tall buttercup; *French :* Renoncule acre; *German :* Scharfhahenfuse.

Description : An annual 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 the sepals. Achenes 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 an adaxially flattened ring, widely spaced and accompanied by patches of pericyclic fibres over phloem. Stem : circular in outline, vascular bundles 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. of 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 m
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.)

Bot. name : *Raphanus sativus* Linn. Family : Cruciferae

Synonyms : *Raphanus hortensis. Raphanus nigrum*

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 combium 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 strength 1/10

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.)

Bot. name : *Rhamnus catharticus* Linn. Family : Rhamnaceae

Common name : *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; a 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 mono-clinic 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 per cent 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.

(a) To first portion of the residue, add a few drops of 5 per cent *aqueous potassium hydroxide;* pink colour develops.

(b) To the second portion, add 0.5 per cent *methanolic solution of magnesium acetate*; pink colour develops on heating.

(c) 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 per cent *magnesium acetate*; three pink spots appear at Rf 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 strength 1/10

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.

ROBINA PSEUDOCACIA

(Robinia)

Bot. name : *Robinia pseudocacia* Linn. Family : Leguminosae.

Common names : *English:* Locust; *French :* Robinier; *German :* Falsche Acacien.

Description : A perennial, up to 25m high with deep furrowed brown bark and prickly branches; young stems 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 T.L.S. consisting of a periderm with a phloem. 18 to 20 cells wide; a phellogen and a phelloderm, forming at places rhytodomes (enclosing secondary cortical and secondary phloem 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; brachysclereids at times among phloem parenchyma. In powder, crystal fibres, 1050-2100 μ by 60-90μ with rhomboid crystals 60-90 μ by 45-52.5μ; sieve tubes 165-231 μ by 26.9 μ; branchysclereid 40-92 μ by 32-60 μ.

Stem bark—in R.L.S. 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 T.L.S. phloem rays spindle shaped, 3 to 9 cells wide, parallel to the phloem parenchyma, sieve tubes, bast and crystal fibres; rhomboid crystals 16-24μ by 9.0 to 16 μ.

Identification :

(i) To 2 ml of alcoholic extract, add 0.5 ml of 10 per cent *aqueous lead acetate solution*; a yellowish brown colour is produced.

(ii) To 2 ml of alcoholic extract, add a little *magnesium metal powder* and a few drops of *dilute hydrochloric acid*; the solution becomes red.

(iii) To 2 ml of alcoholic extract, add 2 drops of *alcoholic ferric chloride solution*; the solution becomes green, turns black on standing.

(iv) T.L.C. with *benzene*: *pyridine*: *formic acid* (30:9:5) as mobile phase and spraying with *ammonia*, seven spots visible under U.V. light at Rf. 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 strength 1/10

Robinia 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.)

$C_{15}H_{18}O_3$ **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*. It is a crystalline lactone obtained from various species of *Artemisia* (Family : Compositae). Contains not less than 99.0 per cent of $C_{15}H_{18}O_3$

Identification : Warm 10 mg with 1 ml of a 10 per cent *alcoholic potassium hydroxide solution*, a violet-red colour is produced.

Melting range : 171° to 174°, H.P.I. Vol. I, p. 215.

Reaction : 0.1 g in 5 ml of *alcohol* (95 per cent) forms a clear solution, neutral to *litmus*

Colour of solution : A 20 per cent 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 filterate gives no precipitate with *potassium mercuric iodide* solution.

Sulphated ash : Not more than 0.1 per cent, H.P.I., Vol. I, p. 23.

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) Trituration 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, p. 19. 6x may be converted to liquid 8x, H.P.I., Vol. I, p. 20.

SOLANUM CAROLINENSE

(Sol. caro.)

Bot. name : *Solanum carolinense* Linn. Family : Solanaceae

Common name : *English* : Horse 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. 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 per cent alcoholic extract, and evaporate to dryness. To the residue add 2 ml of *water* and 1 ml of 10 per cent *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 and 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.

SOLIDAGO VIRGAUREA

(Sol. vir.)

Bot. name : *Solidago virgaurea* Linn. Family: Compositeae

Synonym : *Solidago virgaurea* var. *alpina* Bigel.

Common names : *English:* Goldenrod; *French:* Verge d'or; *German:* Goldrute.

Description : A deciduous, perennial herb, 30 cm 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 involuare acute or acutish.

Part used : Flowering top.

Identification : Extract in 60 per cent a *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 a 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 States and Europe.

History and authority : Introduced by Rademacher's and Gucken, *H.R.*, IV, 205; Clarke: *A Dictionary of Pract. 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.)

Bot. name : *Cola accuminata* Schoot. 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 per cent alcoholic extract to remove alcohol. Make it alkaline with *ammonia solution* and extract with *chloroform.*

(i) 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 Rf 0.45 (blue fluorescence); on spraying with *iodoplatinate reagent* one more spot appears at Rf 0.22.

(ii) 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 Rf. 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., p. 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 and higher to be triturated in accordance with the method, H.P.I., Vol. I, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

STRONTIUM CAROBONICUM

(Str. carb.)

$Sr\ CO_3$ **Mol. wt. : 147.63**

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 per cent of $SrCO_3$ with reference to the substance dried to constant weight at 105°.

Identification : (a) Yields the reactions characteristic of *strontium* and *carbonates*, H.P.I. Vol. I, page 220.

(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 per cent *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, page 225 and for *sulphates* H.P.I. Vol. I, page 225.

Heavy metals : Not more than 10 parts per million, H.P.I. Vol. I, page 229.

Iron : 2 g complies with the *limit test for iron*, H.P.I., Vol. I, page 225.

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 per cent *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 filterate 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 five minutes. Cool, dilute to 25 ml and filter. To the filterate add 2 drops of *phenolphthalein*. If a pink colour is produced, not more than 0.5 ml of 0.01N *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 per cent *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: *Encyclo. Mat. Med.*, Vol. IX, 224; Hering : *Guiding Symptoms*, Vol. X, 89; Clarke: *A Dict. of Pract. Mat. Med.*, Vol. III, 1281.

Preparation : (a) Trituration 1x,

	Drug strength	1/10
Strontium Carboncicum		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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20

STRYCHNINUM NITRICUM

(Stry. nit.)

$C_{21}H_{22}O_2N_2HNO_3$. **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 per cent of $C_{21}H_{22}O_2N_2HNO_3$ with reference to the substance dried to constant weight at 105°.

Idendification : (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 *ammonium 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 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 25ml quantities of *chloroform* until complete extraction of the alkaloid is effected. Combine the chloroform extract with *water,* and evaporate to a small volume. Add 5ml of *alcohol,* evaporate and dry for half and hour at 100°. 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 hydroxide* using *solution of methyl red* as indicator. Each ml of 0.1 N *sulphuric acid* is equivalent to 0.03974 g of $C_{21}H_{22}O_2N_2.HNO_3$.

History and authority : Proved by Camper; Clarke: *A Dict. of Pract. Mat. Med.* Vol.III, 1289.

Preparation : (a) Trituration 2x,

	Drug strength 1/100
Strychninum Nitricum	10g
Saccharum Lactis	990 g

To make one thousand grammes of the Trituration.

(b) Potenceis: 3x and higher to be triturated in accordance with the method, H.P.I. Vol.I, p.19; 6x may be converted to liquid 8x, H.P.I. Vol.I, p.20.

Caution : Not to be dispensed below 3x.

STRYCHNNUM PHOSPHORICUM

(Stry. phos.)

$C_{21}H_{22}N_2O_2.H_3PO_4.\ 2H_2O$ **Mol. wt: 468.00**

English: Strychnine phosphate.

Description : White crystalline powder, soluble in *water*, slighlty soluble in *alcohol*. Contains not less than 97.5 per cent and not more than the equivalent of 100. 5 per cent of $C_{21}H_{22}N_2O_2H_3PO_4H_2O$ 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; and 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 vanadate* 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* p.

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 per cent.

Assay : Weigh accurately about 0.5 g and transfer to a separating funnel, add 40 ml of *water*, 12 ml of *dilute ammonium hyaroxide 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 effected. Wash each *chloroform 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 0.1N *sulphuric acid*, boil, cool and titrate with 0.1N *sodium hyaroxide* using *methyl red* as indicator. Each ml of 0.1N *sulphuric acid* is equivalent to 0.0468 g of $C_{21}H_{22}N_2O_2.H_3PO_42H_2O$.

History and authority : Proved by Clarke: Boericke: *Mat. Med. and Repertory* 9th Ed., 618; Clarke: *Dictionary of Pract. 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, p.19; 6x may be converted to liquid 8x, H.P.I., Vol.I, p.20.

Caution : Not to be dispensed below 3x.

STRYCHNINUM SULPHURICUM

(Stry. sul.)

$(C_{21}H_{22}N_2O_2)_2H_2SO_4 . 5H_2O$ **Mol. wt. 857.0**

English: Sulphate of Strychnin; *French:* Sulfate de strychnin; *German:* Schwefelsaures strychnin.

Description : Colourless transparent, odourless crystals or white crystalline powder; taste intensely bitter; efflorescent in dry air. Sparingly soluble in *water* and slightly in *alcohol*. and *chloroform* and freely soluble in *glycerin* and insloublе in *ether*.

Idendification : (i) Gives reaction characteristics of *sulphates*, H.P.I. Vol.I, p.224 .

(ii) Dissolve 0.5 g in *water*, make it alkaline, extract with *chloroform* and dry to constant weight; melting point of the substance (strychnine) is 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 sometime.

(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 per cent solution in *water* is neutral to *methyl red*.

Chloride : 0.4 g complied with the *limit test of chloride* H.P.I. Vol. I, p. 225.

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 0.1N *sulphuric acid* and titrate the excess of acid with 0.1N *sodium hydroxide* using *methyl red* indicator. Repeat the blank without strychnine, each ml of 0.1N sodium hydroxide is equivalent to 0.085656 g of $(C_{21}H_{22}N_2O_2)_2H_2SO_4 . 5H_2O$.

Histrory 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
Sachharum 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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

SULPHANILAMIDE

(Sul. amid)

$C_6H_8O_2N_2S$

Mol. wt. 172.20

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 per cent and not more than equivalent of 100.5 per cent of $C_6H_8O_2N_2S$ calculated with reference to the substance dried to constant weight at 105°.

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 : 165°.

Arsenic : Not more than 2 parts per million, H.P.I., Vol. I, 266.

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 page 222.

Lead : Not more than 10 parts per million, H.P.I., Vol. I, 227.

Chloride : 1 g complies with the *limit test for chlorides* H.P.I. vol. I, 225.

Alkali-in-soluble matter : 1 g dissolves completely in 5 ml of 10 per cent of w/w solution of *sodium hydroxide* in *water.*

Loss on drying : When dried to constant weight at 105°, loses not more than 0.5 per cent of its weight.

Sulphated ash : Not more than 0.1 per cent H.P.I., Vol. I, 230.

Assay : Dissolve about 0.5 g, accurately weighed, in 75 ml of *water* and 10 ml *hydrochloric acid.* Adjust the temperature of the solution below 15° and titrate slowly with M/10 *sodium nitrate* until distinct blue ring is immediately produced when a drop of the titrated solution is placed on *starch-iodine paper* five 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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

Storage : Preparations below 6x to be kept in well-closed containers protected from light.

SYMPHORICARPUS RACEMOSUS

(Sym. rac.)

Bot. name : *Symphoricarpus racemosus* Auct. **Family** : Caprifoliaceae

Synonyms : *S. Albus* (Lin.), Blacke var. *laevigatus* (Fern) Blacke; *Vaccinium album* Linn.

Common name : *English :* Snow berry

Description : A deciduous shrub, 1 to 3m in height, spreading under ground. Leaves, numerous yellowish brown and glabrous 2 to 4 cm, oval or ovate, obtuse, cuneate or rounded at bast, entire or a few sinuately lobed, dull green and glabrous or sparsely pilose below; petiole 5mm; 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 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.

(i) Carry out TLC of the chloroform extract on silica gel 'G' having mobile phase *benzene : methanol* (95 : 5); it gives four spots in U.V. light at Rf 0.14, 0.30, 0.37 and 0.83. On spraying with solution of *antimony trichloride* in *chloroform*, five spots appear after heating at Rf values 0.14, 0.24, 0.30, 0.49 and 0.65. Spots at Rf 0.30, 0.49 and 0.65 are violet while spots at Rf 0.14, 0.24 are of brownish red colour.

(ii) Carry out 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 U.V. light, having Rf 0.68 and 0.73 and on spraying with *aniline phthalate* and on heating at 120° for 15 minutes; a yellowish brown spot appears at Rf 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

(Tămus c.)

Bot. 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 spearding lobes. Male flower with 6 stemens; female flower with inferior 3-celled ovary with 2 ovules in each laule Style one divided above into 3 two-lobed stigmas. Fruit globose, red berry containing 1 to 6 seeds. Seeds with endo-sperm, globose, pale yellow, wrinkled. Average weight 0.016 g.

Part used : Root.

Identification : Evaporate 20 ml 50 per cent alcoholic extract to remove alcohol. Extract the remaining portion with 25 ml *chloroform* and separate chloroform of aqueous layers.

(i) Carry out TLC of chloroform extract on sillica gel 'G' using *chloroform : methanol* (97 : 3 v/v) as mobile phase. Under UV light four spots appear at Rf 0.30, 0.50, 0.55 and 0.70 (all blue fluorescence). On spraying with *antimony trichloride* and heating at 100° for 15 minutes one additional spot appers at Rf. 0.85 (bluish violet) and the spot at Rf. 0.70 also turns bluish violet in colour.

(ii) Carry out TLC of aqueous layer or 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 per cent) one spot appears at Rf. 0.32 (red) and on spraying with *aniline phthalate* and heating the plate at 100° for 15 minutes, one spot appears at Rf 0.32 (light yellow).

Distribution : South and Western Europe, North America and Asia minor.

History and authority : Clarke : *A Dictionary of Pract. 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 m
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.)

Bot. name : *Tanacetum vulgare* Linn. **Family** : Compositae

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.

Identification :

1. Evaporate 20 ml 50 per cent 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 Rf 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 2N *hydrochloric acid*. Four spots developed at Rf 0.06 (greenish), 0.085 (pink), 0.14 (dirty pink), 0.19 (dirty pink).

Part used : Leaf and twig when in flower.

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.)

Tl. **At. wt.** 204.37

English : Thallium

Description : Bluish white metal, hexagonal crystals closely packed, in elastic, easily fusible very soft, leaves a streak on paper on marking; oxidises superficially in air forming a coating of Tl_2O; readily amalgamates with mercury. Insouble in *water*. Contains not less than 99.5 per cent of Tl.

Identification : (1) Dissolve about 10 mg in *dilute sulphuric acid* and add a few drops of 10 per cent *potassium iodide solution;* a yellow precipitate is produced which is insoluble in *sodium thiosulphate solution.*

(2) Dissolve 01 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 *phosphomolyobic acid slolution* and one drop of 50 per cent *hydrobromic acid;* a dark or light blue stain is produced.

Arsenic : Not more than 20 parts per million, H.P.I., Vol. I, 226.

Chloride : Not more than 100 parts per million, H.P.I., Vol. I, 225.

Sulphate : Not more than 100 parts per million, H.P.I., Vol. I, 225.

Heavy metals : Not more than 20 parts per million, H.P.I. Vol. I, 229.

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 80° and add 2 g of *potassium chromate.* Allow to stand at room temperature for at least 12 hours. Filter and wash with 1 per cent *potassium chromate solution* then with 50 per cent *alcohol*, and dry at 120° 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, p. 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, p. 20.

Caution : Poisonous ! Not to be dispensed below 3x.

THEA CHINENSIS

(Thea)

Bot. name : *Camellia sinensis* Linn. Kuntz. **Family :** Theaceae

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 eliptic-lanceolate or obovate-lanceolate, short perioled, acuminate serrate on the margins, smooth on both sides, occasionally pubescent beneath, green, shiny pinnately viened, with prominent mid rib. Flowers pedicellate, white, axiliary; sepals orbicular, glabrous with membranous ciliate edges; petals obovate, obtuse, glabrous or pubeseent 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. Filter. To the filtrate add 10 ml of 50 per cent *sulphuric acid* and boil until the volume is reduced to 100 ml, filter in a separating funnel, wash the flask with 1 per cent *sulphuric acid*. Combine fltrates and washings. Make alkaline with 10 per cent *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 per cent *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 105°. 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 Dictonary of Pract. 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.)

$NH_2CSNH\,CH_2CH_2CH_2$ **Mol. wt.** 116.19

English : Allylthiousea

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 per cent *ammonia.*

Melting point : 76°-78°.

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 strength 1/10

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, 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, 20.

THALAPSI BURSA PASTORIS

(Thal. b.p.)

Bot. name : *Capsella bursa pastoris* Moench. **Family** : Cruciferae

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 both the epidermii; mesophyll differentiated into palisade and spongy parenchyma cells; mid rib 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 endodermis; vascular bundles arranged in a ring are conjoint collateral and open, 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
Thalapsi Bursa Pastoris, containing solid 100 g and 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.

16—1 M of HF/W/ND/86

THYMOLUM

(Thymol)

$C_{10}H_{14}O$ **Mol. wt.** 150.20

English : Isopropylmseta creasol, 2-1 sopropyl-5-methyl-phenol

Description : Obtained from oils of thymol, *Thymus vulgaris* (Labiatae), *Monarda punctata* (Labiatae) and *Trachyspermus amin* (*Ajewan*) (Umbelliferae) 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 is raised to about 45°, 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 per cent 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 49°.

Reaction : A solution in *alcohol* is neutral to *litmus.*

Non-volatile matter : Leaves not more than 0.05 per cent of residue when heated in an open dish on a water-bath and dried to constant weight at 105°.

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.)

Bot. 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 branchelets glabrous. Leaves broadly ovate, abruptly accuminate, 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 cluster. Fruit ovoid or globose, apiculate, tomentose, thick shelled.

Part used : Blossom (young flowers).

Macroscopical : Flowers in pedunculous cyme, 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 per cent 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 antimony trichloride*. Four spots appear at Rf 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 reagent as in test I, five spots appear at Rf. 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-butanol acetic acid : water* (4:1:1 v/v) as mobile phase and *aluminium chloride solution* as spray reagent. Four spots appear at Rf 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. 4, part 2, p. 300; Allen : *Encyclop. Mat. Med.*, Vol. X, 1.

Preparation : Mother Tincture ϕ,

	Drug strength	1/10
Tilia Europae in *coarse powder*		100 g
Purified Water		400 ml
Strong Alcohol		635 ml

To make one thousand millilitres of Mother Tincture.

Potencies: 2x to contain one part Mother Tincture, four parts purified Water, five parts Strong Alcohol; 3x and higher with Dispensing Alcohol.

TITANIUM

(Titan.)

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 950° 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 some time; 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, 240.

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 per cent *tannic acid solution*. Dilute to 40 ml, stir thoroughly and cool. Introduce a 20 per cent *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 2 per cent *sulphuric acid*, 1 g *ammonium sulphate* and 0.1 g *antipyrine*. Dry the precipitate at 100°. Transfer it to a weighed crucible, heat gently at first and then ignite at 700°-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, p. 316 (1863); Allen : *Encyclop. Mat Med.* Vol. X, 14.

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

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, p. 19; 6x may be converted to liquid 3x, H.P.I., Vol. I, p. 20.

TRIFOLIUM PRATENSE

(Tri. prat.)

Bot. name : *Trifolium pratens* Linn. Family : Leguminosae

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 seteceous, one 4 to 7 mm long, four 2 to 5 mm long; corolla magenta varying to nearly white; standard obovate-oblong, equalling or slightly exceeding the oblong, obtuse wings.

Part used : Flower

Identification : (i) 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 reagent; it gives eight spots having Rf value 0.22, 0.28, 0.59, 0.63, 0.75, 0.88, 0.95, 0.98; all spots brown except at Rf 0.75 which is pink.

(ii) 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 per cent *ethanolic solution of aluminium chloride* as spray reagents; it gives two yellow spots, having Rf 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 m
Strong Alcohol	730 m

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.)

Bot. name : *Petasites japonicus*, F. Schm. Family : Compositae

Synonym : *Tussilago petasites*, Vell.

Common names : *English :* Butter Bur; *French :* Herbe aux teigenux; *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 per cent alcoholic extract to remove alcohol. Then extract the remaining part with *chloroform* and separate the two layers.

(a) 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 Rf. 0.17, 0.27 and 0.85 under UV light. On spraying with *antimony trichloride solution*; *one* blackish violet spot appears at Rf 0.85.

(b) 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 per cent *methanolic sulphuric acid* as spray reagent. Two spots appear at Rf. 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 Dict. of Pract. 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 pat Mother Tincture, four parts Purified Water, five parts Strong Alcohol; 3x and higher with Dispensing Alcohol.

URANIUM NITRICUM

(Uran. nit.)

$UO_2(NO_3)_2.6H_2O$ **Mol wt.** 502.18

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 per cent 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 per cent *potassium ferrocyanide solution*; a brown precipitate is produced.

(b) Yields the reactions characteristic of *nitrates*, H.P.I. Vol. I, p. 222.

Chloride : 10 g complies with the *limit test for chlorides*, H.P.I. vol. I, page 225.

Heavy metals : Not more than 5 parts per million.

Iron : 4 g complies with *limit test for iron*, H.P.I. Vol. I., p. 225.

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 per cent *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; *Hannemann Mat. Med.*, Part 2, 1871 ; Allen : *Encyclop. Mat. Med.* Vol. X, 41 ; Hering ; *Guiding Symptoms*, Vol. X, 357; Clarke: *A Dictionary of Practical Mat. Med.* Vol. III, p. 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 1x, Drug strength 1/10

Uranium Nitricum 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, p. 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, p. 20

Caution : Poison : Not to be dispensed below 3x.

Storage : All preparations below 3x to be freshly made.

USNEA BARBATA

(Usnea b.)

Bot. 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 per cent *sodicum bicarbonate solution* 3 times and combine the aqueous extract.

(a) 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. 5 spots appears at Rf value 0.31, 0.40, 0.60, 0.70 (yellow) and 0.81 (brown).

(b) The *sodium-bi-carbonate* extract layer is neutralised with 10 per cent 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 Rf value 0.51 and 0.60.

(c) 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 permangnate* as spray reagent; two yellow spots appears at Rf 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 Pract. 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)

Bot. 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; seeds 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 per cent *alcohol*; carry-out TLC on silica gel 'G' using *chloroform; acetone* (4:1 v/v) as mobile phase and 30 per cent *chlorosulphonic acid in acetic acid* as spray reagent. On heating, four spots appear at Rf. 0.16 (blue 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. of Mat. Med.*, Vol. X, 172; Clarke: *A Dictionary of Pract. 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 Alcohal.

ZINCUM ACETICUM

(Zinc . ac.)

$(CH_3COO)_2Zn_2.H_2O$ **Mol. wt.** 219.50.

English : Acetate of zinc, *French :* Ace'tate de zinc; *German :* Zinkacetat,

Description : Soft, white, silky plates or monoclinic crystals of a pearly lustre; odour faint and acetous; taste sharp, disagreeable and metallic. Soluble in *water* and sparingly soluble in *alcohol*. Contain not less than 99.5 percent $(CH_3COO)_2Zn_2H_2O$ with reference to substance dried at 150°C.

Identification : Yields reactions characteristics of *zinc* and *acetates* H.P.I. Vol. I page 220.

Reaction : A 5 per cent 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, p. 225.

Chloride : 1 g complies with the *limit test for chlorides*, H.P.I. Vol. I, p. 225.

Sulphate : 1 complies with the *limit test for sulphate* H.P.I. Vol. I, p. 225.

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 $(CH_3COO)_2Zc_2.H_2O$

History and authority : Introduced by Franz and proved by *Hahnemann;* Allen : *Encyclop. Mat. Med.;* X, 213; Clarke: *A Dictionary of Pract. 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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, page 20.

ZINCUM BROMATUM

(Zinc. br.)

$ZnBr_2$ **Mol. wt.** : 225.21

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 then 97.0 per cent 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, 137.

(ii) To 2 ml of the above solution, add 1 ml of *phosphoric acid* and mix with 0.05 ml of 0.1 per cent w/v *solution of copper sulphate* and 2 ml of *solution of mercuric ammonium thiocyanate*; a violet precipitate is produced.

Reaction : Aqueous solution is acadic to litmus.

Assay : Take about 0.3 g accurately weighed add 10 ml of 1N-*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 $Zn\ Br_2$.

History and authority : Proved by Hale; Clarke : A Dictionary of Pract. Mat. Med. Vol. III, 1597.

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

Zincum Bromatum *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, HPI., Vol. I, p. 19; 6x may be converted to liquid 8x, HPI., Vol. I, p 20.

ZINCUM MURIATICUM

(Zinc mur.)

$ZnCl_2$ **Mol. wt.** : 136.30

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 per cent of $ZnCl_2$.

Identification : Yields reactions characteristic of *zinc* and of *chlorides*.

Reaction : 5 per cent solution in *water* is acidic to *litmus*.

Iron : 0.1 g complies with *the limit test for iron*, using 6 drops of *thioglycollic acid*.

Ammonia : Dissolve 1 g in 5 ml of *water;* add 5ml of *sodium hyaroxide solution* and warm; no ammonia is evolved.

Oxychloride : Dissolve about 0.2 g, accurately weighed, in 50 ml *water* and titrate with 0.1N *hydrochloric acid* using *methyl orange* as indicator; not more than 12.5 ml of 0.1N *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 five minutes, stir thoroughly to induce crystallisation, and allow to stand for one hour. Transfer to a small suction filter, washing five times with quantities, each of 10 ml, of a mixture of 1 volume of *mercuric ammonium thiocyanate 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 iodata*, 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. of Mat. Med.*, Vol. X, 215; Clarke : *A Dictionary of Pract. 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, p. 19; 6x may be converted to liquid 8x, H.P.I., Vol. I, p. 20.

ZINCUM OXYDATUM

(Zinc. ox.)

ZnO **Mol. wt. :** 81.32

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*, and in *alcohol;* soluble in solutions of *alkali hydroxides* and in dilute mineral acids. Odourless; tasteless. It contains not less than 99.0 per cent of ZnO calculated with reference to the substance dried to constant weight at 105°.

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* is 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 a 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, page 227.

Metallic zinc : Dissolve 2 g in a mixture of 30 ml of *dilute hydrochloric zinc* and 10 ml of *water* to which has been added 1 drop of *solution of lead acetate;* the solution is clear and colourless.

Loss on drying : Loses not more than 1 per cent of its weight when ignited to constant weight.

Assay : Weigh accurately about 1.5 g and dissolve in 50 ml of 1N *sulphuric acid* containing 2.5 g of *ammonium chloride*. Titrate the excess of acid with 1N *sodium hydroxide* using *methyl orange* as indicator. Each ml of 1N sulphuric acid is equivalent to 0.04069 of ZnO.

History and authority : Proved by Wernek, Buchner and Michaelis; Clarke: *A Dictionary of Pract. Mat. Med.*, Vol. III, 1601.

Preparation : (a) Trituration 1x,

	Drug strenggh	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 p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 29.

Storage : Preparations below 3x to be kept in well-closed containers.

ZINCUM PHOSPHORATUM

(Zinc. phos.)

Zn_3P_2 **Mol. wt. :** 258.10

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 garlic-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 per cent of Zn_3P_2 with reference to the substances dried to constant weight at 105°.

Identification : (a) Acidic solution gives reaction characteristic of zinc, HPI, Vol. I, 239 and *phosphides*, HPI, Vol. I.

(b) 1.0 g of the finely powdered substance when treated with an *aqueous solution of ammonium chloride* and kept over-night, should weigh not less than 0.9 g after washing successively with *water*, *alcohol* and *ether* and drying.

Arsenic : Not more than 10 parts per million H.P.I., Vol. I, 226.

Iron : Dissolve 0.1 g in 10 ml *dilute nitirc 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 *thio-glycollic 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 ensues, cool, keep on adding *conc. nitric acid* drop-wise, until the reaction is complete. Cool the mixture and add a drop of *phenolphthalein* and add *dilute ammonium hydroxide solution* till the precipitation is complete. Collect it on a sintered glass crucible, wash with *water* and dry at 105°. Weigh as $Zn_3(P)O_4$. Each g of precipitate is equivalent to 0.6649 g of Zn_3P_2.

History and authority : Introduced by Thompson, *Practitioner*, 1873 (2) p. 271; Allen : *Encyc. of Pure Mat. Med*, Vol. X, p. 221.

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

Zinc Phosphoratum	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, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

Caution : Poison ! Not to be dispensed below 3x.

Storage : All preprations below 6x to be kept in well-closed container protected from light.

ZINCUM VALERIANICUM

(Zinc. val.)

Mol. weight : 267.62

English: Valerianate of zinc; *French:* Valerianate dezinc; *German*: Zinc vaelerianat.

Description : Anhydrous, white lamellar crystalls 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 per cent *sodium quinaldate solution* with stiring 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 $(C_5H_8O_2)_2$.

History and authority : Introduced and proved by Finney; Clarke : *A Dictionary of Practical Materia Medica*, 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 the method, H.P.I., Vol. I, p. 19; 6x may be converted to liquid 8x, H.P.I. Vol. I, p. 20.

APPENDIX I

MATERIALS AND SOLUTIONS EMPLOYED IN TESTS

Acetic acid : Of the H.P.I., Vol. I, 191.

Acetone : Of the H.P.I., Vol. III, 115.

Alcohol : Of the H.P.I., Vol. II, 43.

Alum, Solution of : A 5.0 per cent w/v solution of alum in *water*.

Aluminium chloride : Of the H.P.I., Vol. IV, 109.

Amaranth, solution of : Of the H.P.I., Vol. I, 191.

Ammonia/Ammonium Chloride Buffer : Of the H.P.I., Vol. III, 116.

Ammonia, Carbon-dioxide free : Ammonia which is protected from atmosphere durin cooling and storage.

Ammonia solution, Dilute : Of the H.P.I., Vol. I, 192.

Ammonium acetate : Of the H.P.I., Vol. I, 192.

Ammonium chloride, solution of : Of the H.P.I., Vol. I, 193.

Ammonium molybdate : Of the H.P.I., Vol. I, 193.

Ammonium molybdate, 5 per cent solution of : Of the H.P.I., Vol. I, 193.

Ammonium oxalate, solution of : Of the H.P.I., Vol. I, 193.

Ammonium persulphate : Of the H.P.I., Vol. III, 116.

Ammonium sulphate : Of the H.P.I., Vol. IV, 110.

Ammonium thiocyanate : Of the H.P.I., Vol. I, 194.

Ammonium valiadate : NH_4VO_3 : Should contain not less than 98.0 per cent of NH_4VO_3.

Description—A white crystalline powder.

Assay—Dissolve 0.5 g in 30 ml of *water* in 1ml 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 0.1N *potassium permangnate*. Each ml equivalent to .0117 g of NH_4VO_3.

Aniline : Of the H.P.I., Vol. IV, 111.

Aniline phthalate : Of the H.P.I., Vol. IV, 111.

Antomony trichloride : Of the H.P.I., Vol. III, 117.

Arsenious acid, solution of : Arsenic chloride solution prepared with 1 g arsenious trioxide, 5 m *dilute hydrochloric acid* and *water* 100 ml.

Ascorbic acid : Of the H.P.I., Vol. III, 117.

Barium chloride, solution of : Of the H.P.I., Vol. I, 194.

Benzene : Of the H.P.I., Vol. III, 118.

Benzidine : $NH_2 (C_6N_4)_2NH_2$.

Description—A pale buff coloured crystalline powder.

Solubility—Readily soluble in *alcohol* (90 per cent) 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°—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, 195.

Brucine : Of the H.P.I., Vol. I, 195.

Butanol : Of the H.P.I., Vol. IV, 112.

Calcium hydroxide, Aqueous solution of : Approximately 0.15 per cent w/v solution of calcium hydroxide in *water*.

Calomel : Of the H.P.I., Vol. I, 145.

Carbon disulphide : Of the H.P.I., Vol. I, 195.

Chloroform : Of the H.P.I., Vol. IV, 112.

Chlorosulphuric acid : $Cl\ So_3\ H$

Description—A colourless, corrosive, fumingless.

Boiling point—about 151°

Wt per/ml — about 1.76 g

Cobalt chloride : Of the H.P.I., Vol. III, 119.

Copper : Of the H.P.I., Vol. I, 196.

Copper sulphate, solution : Of the H.P.I., Vol. IV, 113.

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 : A solution of *dimethyl glyoxime* in *alcohol*

Alcoholic, solution of : containing 5.0 per cent 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—Insolube in *water.*

Soluble in *alcohol*

Melting range—89° to 90°

Sulphated ash—Not more than 0.1 per cent

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 range—165° to 169°

Sulphated ash—Not more than 0.1 per cent.

Dithizone : $C_6H\ N_5$: $N.C_5S.\ NH.NH.\ C_6H_5$

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, 113

Ethyl acetate : Of the H.P.I., Vol. IV, 114

Ethyl ether : Of the H.P.I., Vol. IV, 113

Ferric ammonium sulphate : Of the H.P.I., Vol. I, 197

Ferric chloride solution of : Of the H.P.I., Vol. I, 197

Ferrous sulphate, solution of : Of the H.P.I. Vol. III, 121

Ferric acid : Of the H.P.I., Vol. IV, 115

Glycerine : Of the H.P.I., Vol. III, 122

Hexamine : $C_6H_{12}N_4$

Should contain not less than 99.0 per cent 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—I. Mix 0.1 g with an equal weight of *salicylic acid* and heat with 1 ml of *sulphuric acid;* a caremaine 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 per cent 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 1N *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 1N *Sodium hydroxide* using solution of *methyl red* as indicator. Each ml of 1N sulphuric acid is equivalent to .03505 g of $C_6H_{12}N_4$.

Hydrochloric acid, Iron free : Hydrochloric acid which contains 35.0 per cent 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 .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, 123.

Hydroquinone, Aqueous solution of : A solution of Hydroquinone in *water* containing 5.0 per cent w/v of $C_6H_4(CH)_2$.

Iodoplatinate : Of the H.P. I., Vol. IV, 115

Lead acetate : Of the H.P.I., Vol. IV, 116

Lead acetate, solution of : Of the H.P. I., Vol. I, 199

Lead dioxide : PbO_2

Description—A dark brown powder. Chloride, bromide and iodide —Warm 2 mg with 50.0 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.

Magnexium acetate, methanolic solution of : Of the H.P.I., Vol. III, 124

Magnexium 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 27g of mercuric chloride in sufficient water to produce 1000 ml.

Mercuric Iodide : Of the H.P.I., Vol. I, 147.

Mercuric nitrate, solution of : Of the H.P.I., Vol. IV, 116

Methanol : Of the H.P.I., Vol. IV, 117

Methyl ethyl ketone : $CH_3CO\ C_2H_5$

Contains not less than 88.0 per cent 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/ml — 0.81 g

B—Naphthol : Of the H.P.I. , Vol. III, 125

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 per cent w/v solution of *ninhydrin* in a mixture of 95 volumes *butanol* and 5 volumes of 2M *acetic acid.*

Nitric acid : Of the H.P.I., Vol. I, 36

Nitric acid, dilute : Of the H.P.I., Vol. I, 201

Nitric acid, fuming : Of the H.P.I., Vol. III, 126

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, 126

Potassium permangnate : Of the H.P.I., Vol. IV, 120.

Potassium permangnate, solution of : Of the H.P.I. Vol. III, 127

Potassium permangnate, acidic : Of the H.P.I., Vol. III, 127

Potassium sodium tartarate : Of the H.P.I., Vol. III, 131

Resorcinol : Of the H.P.I., Vol. IV, 120

Silver nitrate, solution of : Of the H.P.I., Vol. I, 205.

Sodium acetate : Of the H.P.I., Vol. III, 127

Sodium bicarbonate : Of the H.P.I., Vol. IV, 121.

Sodium carbonate, solution of : Of the H.P.I., Vol. I, 206

Sopium carbonate-Anhydrous : Of the H.P.I., Vol. IV 122.

Sodium chloride : Of the H.P.I. Vol. I, 151.

Sodium hydroxide, solution of : Of the H.P.I., Vol. III, 129.

Sodium nitrate : Of the H.P.I., Vol. III, 130.

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 of *potassium Iodide* and titrate the liberated *iodine* with 0.1N *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 per cent distils between 210–212°.

Wt per ml — About 1.2g.

Petroleum ether (light) : Of the H.P.I., Vol. III, 126.

Phenazone : $C_{11}H_{12}ON_2$

Contains not less than 98.0 per cent of $C_{11}H_{12}ON_2$.

Description—A white, crystalline powder.

Melting range—111° to 123°

Sulphated ash—Not more than 0.1 per cent.

Assay—Weigh accurately about 0.2 g and dissolve in 20 ml of a 100 per cent w/v *solution of sodium acetate* add 30 ml of 0.1N *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 0.1N *sodium thiosulphate*, using *starch* as indicator. Each ml of 0.1N iodine is equivalent to 0.009412 g of $C_{11}H_{12}ON_2$.

Phioroglucinnol : $C_6H(CH)_3.2H_2C$

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 per cent. be kept protected from light.

Phosphomolybdic acid : $H_3PO_4.12\ MoO_3.24\ H_2O$

Description—Deep yellow crystals.

Solubility—Very soluble in *water*. A 10 per cent w/v solution in *water* is clear.

Ammonia—Boil 0.5 g with 20 ml of a 5 per cent 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, 37.

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 0.1N *potassium permangnate* 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 per cent 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 per cent w/v solution is not greater than 8.6.

Potassium carbonate : Of the H.P.I., Vol. I, 202

Potassium chromate : Of the H.P.I., Vol. I, 202.

Potassium cupri artarate, solution of : Of the H.P.I., Vol. I, 202.

Potassium dichromate : Of the H.P.I., Vol. I, 203.

Potassium hydroxide, alcoholic solution of : A solution of *potassium hydroxide* in *alcohol* containing 10.0 per cent w/v of KOH.

Potassium iodide, solution of : Of the H.P.I., Vol. I, 204.

Potassium mercuric iodide, solution of : Of the H.P.I., Vol. III, 126.

Sodium sulphide : Of the H.P.I., Vol. I, 206.

Sodium thiosulphate, solution of : Of the H.P.I., Vol. II, 131.

Stannnous chloride, solution of : Of the H.P.I., Vol. I, 206.

Starch : Of the H.P.I., Vol. IV, 122.

Mucilage starch : Of the H.P.I., Vol. IV, 122.

Sulphuric acid : $H_2N.\ C_6H_4.\ SO_3H$

Contains not less than 99.0 per cent 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 per cent.

Assay—Suspend about 5 g, accurately weighed, in 100 ml of water and titrate with 1N *sodium hydroxide* using *solution of phenolphthalein* as indicator. Each ml of 1N sodium hydroxide is equivalent to 0.1732 g of $C_6H_7O_3NS$.

Sulphuric acid, concentrated : Of the H.P.I., Vol. I, 38.

Sulphuric acid, dilute : Of the H.P.I. Vol., IV, 123.

Sulphuric acid, Methanolic : Of the H.P.I., Vol. IV, 123.

Tannic acid, solution of : Of the H.P.I. Vol., III, 132.

Thioglycollic acid : Of the H.P.I., Vol. I, 207.

Water-carbon dioxide free : : Of the H.P.I., Vol. I, 208.

Zinc, granulated : Of the H.P.I., Vol. I, 208.

Zinc, fillings : Of the H.P.I., Vol. I, 186.

APPENDIX II

SOLUTIONS EMPLOYED IN VOLUMETRIC DETERMINATIONS

Acetic acid 7M : Of the H.P.I., Vol. IV, 125

Ammonium thiocyanate, 0–1N : Of the H.P.I. Vol. IV, 125

Disodium edetate .05M : Of the H.P.I., Vol. IV, 125.

Ethylene diamine tetra acetate, .01M : *Ethylene diamine tetraacetate* 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 0.1N : Of the H.P.I., Vol. IV, 125

Iodine, 0.1N : Of the H.P.I., Vol. IV, 125

Magnesium sulphate, 0.1M, .05M : 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, 133

Perchloric acid 0.1N : Cool 750 ml of *glacial acetic acid* to about 15° and add slowly, with continuous stirring, 11 ml of *perchloric acid* (60 per cent 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 0.1N *sodium acetate* using 1 ml of *solution of Naphthol-benzene* as indicator. Each ml or 0.1N sodium acetate is equivalent to 0.010047 g of perchloric acid.

Potassium iodate, .05 M : Of the H.P.I., Vol. IV, 126

Silver nitrate, 0.1M : Of the H.P.I., Vol. IV, 126 .

Sodium hydroxide, 0.1N, 1N: : Of the H.P.I., Vol. IV, 126

Sodium nitrate, 0.1M : *Sodium nitrate* dissolved in *water* to contain in 1000 ml of following quantity of $NaNO_3$—

For 0.1M .....6.901 of $NaNO_3$.

Sodium thiosulphate, 0.1N : Of the H.P.I., Vol. IV, 126

Sulphuric acid, 0.1 N : Of the H.P.I., Vol. IV, 126

Zinc chloride, .05 M : Dissolve 3.269 g of *granulated zinc* in the minimum amount of 2N *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, 210

Bromophenol blue : Of the H.P.I., Vol. I, 210

Bromothymol blue : Of the H.P.I., Vol. I, 210

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, 210

Methyl red : Of the H.P.I., Vol. I, 211

Mordant black : Of the H.P.I. Vol. III, 125

Rhodamine-b : Of the H.P.I. Vol. III 127

Thymol blue : Of the H.P.I., Vol. III, 128

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, 184.

2 Sucros : 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 per cent solution in *water* by boiling with 0.1N *sulphuric acid* and neutralise with a *solution of* 0.1 *per cent sodium hydroxide*. Add a *potassium cupri-tartarate solution* and heat; a copious red precipitate is produced.

Reaction—A 10 per cent 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 hypophosphorous acid*, does not develop an unpleasant odour in one hour.

Sulphated ash—not more than 0.02 per cent ; H.P.I. Vol. I, 243.

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 per cent.

(2) Lactose content—Not less than 94 per cent proximate 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 per cent *lactose*.

(3) Binder—Not exceeding 3 per cent w/w.

(4) Lubricants—Not exceeding 3.0 per cent w/w.

(5) Insoluble matters—Not exceeding 5.0 per cent 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 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 vlaue—Hand made tablets (TT)—not exceding 0.1 per cent w/w. Compressed tablets— not exceeding 0.5 per cent 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 per cent.

(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 75 mm; 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 centre. 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 and lower the 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 is, 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 per cent sucrose and 20 per cent *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 calliper and the measure is designated as numbers. Permitted varaition $\pm 10\%$.

(4) The globules should be perfectly gloubular; the diagonal diameters measured with the help of screw gauge shall not vary more than 10 per cent 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 per cent 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 per cent, *methylene blue solution* to the centre 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 cent w/w in raw material.

Co-TLC with tinctures made from authenticated raw material is also permitted.

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 cent w/w in raw material.

Co-TLC with tinctures made from authenticated raw material is also permitted.

APPENDIX XXV

(A) *Standards 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) *Standards 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 sterilise 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 opthalmic preparations should confirm to the schedule FF of Drugs and Cosmetics Rules.

(C) *Cream Based Ointment*:

Cream based ointment 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 formulation.
4. It should contain a minimum quantity of preservatives.

(D) *Paraffin ointment:*

White Beewax	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 percentages.

APPENDIX XXVI

Standards for Syrup

Sucrose	667 g
Purified water, sufficient to produce	1000 g

Add sucrose to purified *water* and heat with occasional stirring until dissolved. Add sufficient boiling Purified Water to produce 1000 g.

Wt. per ml- At 20°, 1.315 g to 1. 327 g.

Note— Parabens in a concentration not higher than 0.15 per cent 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

Observed temp. in 0°C to 20°C	Observed alcohol % at 20°C	Corresponding alcohol % at 15°C
	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
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	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

Observed temp. in 0°C to 20°C	Observed alcohol % at 20°C	Corresponding alcohol % at 15°C
	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

Sl. 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 Indica	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 Picricum	II	91-95
14.	Acidum Salicylicum	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.	Aesulus 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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
42.	Anagallis Arvensis	IV	56-60
43.	Andrographis Paniculata	I	57-61
44.	Augustra	III	66-70
45.	Anilinum	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.	Apomophinum 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.	Berberis 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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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.	Ceanothus 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 Anthelminticum	II	67-71
120.	Chimaphilla 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.	Cineraria 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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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.	Craetagus 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.	Cundorango	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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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 Annus	V	47-51
207.	Heleborus Niger	I	57-61
208.	Helonias Dioica	III	57-61
209.	Holarrhena Antidysentrica	I	56-60
210.	Hydrangea Arborescens	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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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	IV	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 Officinalis	IV	56-60
273.	Pareira Brava	III	66-70
274.	Paris udrifolia	IV	56-60
275.	Passiflora Incarnata	II	57-61
276.	Pastinaca Sativa	V	71-75

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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 Peltatum	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.	Renunculus 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	V	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

Sl. No.	Name	H.P.I. Volume	Alcohol limit
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.	Terminalia 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

Sl. No.	Name	H.P.I. Volume		Alcohol limit
364.	Thuja Occidentalis	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
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390.	Yucca Filamentosa	V	I	75.5-79.5
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