The extra pharmacopoeia of Martindale and Westcott.

Contributors

Westcott W. Wynn 1848-1925.
Martindale W. Harrison 1874-1933.
Martindale William, 1840-1902.
Royal College of Physicians of Edinburgh

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THE
EXTRA PHARMACOPŒIA

MARTINDALE
AND
WESTCOTT

TWELFTH EDITION

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THE

Extra Pharmacopœia

OF

Martindale and Westcott.

REVISED

BY

W. HARRISON MARTINDALE, PH.D., F.C.S

AND

W. WYNN WESTCOTT, M.B.LOND., D.P.H

H.M.'S CORONER FOR NORTH-EAST LONDON.

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PREFACE TO THE TWELFTH EDITION.

DURING the last two years the Authors have been engaged in a careful revision of the 11th Edition of the 'Extra Pharmacopœia,' regarding the subject matter from many points of view.

In this, the 12th Edition, nearly 250 pages have been added,—the book, however, remains even now only a few ounces in weight, and may be conveniently carried in the pocket of the physician or the chemist.

Current Literature has been assiduously searched to provide ready references to all the more important recent results in Therapeutics and in Organic and Inorganic Pharmaceutical Chemistry. We have had occasion to refer to a larger number of books and periodicals than in the past (*see* List of Abbreviated Titles).

Since the publication of the 11th Edition of the work several new standard books of reference have appeared. Firstly we may refer to the 1900 issue of the **United States Pharmacopœia** as effected by the 8th Decennial Revision. This edition became Official in the United States on September 1st, 1905. We have pointed out in our text the more important chemicals, drugs, and preparations which are Official in the United States and have given a short outline, where necessary, of the methods of manufacture and the average adult dose as defined by the U.S.P. We have, at the same time, outlined the Assay Methods which have been introduced in the Pharmacopœia in question, as many of the drugs and preparations there assayed are not standardised in the British Pharmacopœia, and the processes necessary are not easily found in the works of reference which a pharmacist has at his disposal.

The publication of **'The National Standard Dispensatory,'** which succeeds the 'National Dispensatory' of Stillé and Maisch, has necessitated an occasional reference to its pages.

The Seventh Edition (1905) of the **Farmacopea Española** has also received our attention. This work is in some respects well up to date; many of the modern synthetic compounds find a place therein. Some of the important medicamenta have been introduced into our text, and in the case of others we have indicated in the Index the Spanish official names for the same with their customary synonyms. We have also abstracted a Drop Measure Table, and have stated the strengths of the potent remedies.

The appearance of the Eighth Edition (1906) of the **Pharmacopoea Austriaca** whilst we were engaged in the proof-reading enabled us to include a number of the alterations effected by this Pharmacopœia also.

Similarly the *Editio quarta* (1906) of the **Pharmacopoea Nederlandica** has interested us. It contains a number of vegetable drugs indigenous to the Dutch East Indies. We also include comments on the **Pharmacopoea Belgica**, *Editio tertia*, 1906.

A new **French Codex** is promised very shortly, and we have occasionally noted anticipated contents.

We have also to acknowledge reference to new Editions of several *Hospital Pharmacopœias* which have appeared, namely, those of *St. Mary's Hospital*, the *Royal Free Hospital*, the *New Hospital for Women*, and the *Royal Dental Hospital*.

In the field of Therapeutics we quote from the latest authorities, including Medical Journals, Magazines and the Reports of Scientific Societies.

It may be observed in passing that we have introduced the customary armamenta of **Dental Therapeutics**. In the case of **Organotherapy, Antitoxins** and **Serum-therapy**, we have consulted the recently published works of H. Batty Shaw, M.D., W. Cecil Bosanquet, M.D., and other authorities.

Throughout the work on this edition it has been necessary to verify experimentally the published recipes for a large number of Pharmaceutical Preparations. In the actual working of many we must confess we have

been disappointed; these formulæ have been improved upon.

We have also checked in our laboratories figures for Solubilities which have appeared from time to time.

In view of the fact that new, or so-called new, chemicals are offered almost daily to the medical profession, principally by firms on the Continent, it was deemed desirable to supply Chemical Formulæ for those bodies to which an actual definite chemical constitution could be attributed. These Formulæ we have, as far as possible, given by a graphic representation, as distinct from the empiric additive method.

While acknowledging to the utmost the many valuable results which Continental chemists have achieved, we think that British medical men should weigh carefully the merits of a 'new' chemical before prescribing it.

We have calculated the **Molecular Weights** of all Chemical substances to which formulæ can be assigned, both in terms of the Atomic Weights of the British Pharmacopœia and those of the International Committee (1906). These latter weights, it will be remembered, differ from the weights of the United States Pharmacopœia, in that the International Committee decided to adopt figures with Oxygen equal to 16 as their unit. In some instances we have added the U.S. weights for substances contained in that Pharmacopœia. In laboratory work the manufacturing Chemist will find it convenient to have these figures ready. In the calculations we have to acknowledge the assistance of Mr. F. F. De Morgan, F.C.S.

The Privy Council, in July, 1905, on the representation of the Pharmaceutical Society of Great Britain, approved of the scheduling as poisons (in Part II) of:—Digitalis and its preparations, Strophanthus and its preparations, Mercuric Iodide and Mercuric Sulpho-Cyanide, and the addition of Picrotoxin and Cocaine and its Salts to Part 1 of the Schedule in the Pharmacy Act, 1868. The Privy Council, however, did not approve of the proposal to schedule Acetanilide, the soluble Oxalates and Sulphonal. It would, in the opinion of coroners and medical practitioners, have been advisable to restrict the sale of these drugs. We append (*v.p.* 895) a copy of Parts I. and II. of Schedule "A" of Poisons within the meaning of the Pharmacy Act, 1868, brought up to date.

As to modern Chemicals, Drugs, Galenical Preparations and Methods of Treatment, we desire to draw attention to the following, most of which are new to the book :—

Aconitum (the latest work by Dunstan, Freund, and others is indicated).
Adreucaine.
Alypin.
Anthrax Serum.
Argenti Iodidum Recentum.
Benzoyl Peroxide.
Bismuth Subiodate.
Calcium Metal (made by electrolysis).
Capsicum Plasters (dental).
Cascara Jelly.
,, Mixtures (several new).
Cataplasma Salicylicum Compositum.
Cerium, and several salts of same (new monograph).
Cinnaldehydum.
Cinnamon Preparations (new monograph).
Colalin (Colalic Acid).
Copper Acetate and Phosphate (new monograph).
Copper—Methods of water disinfection.
Cotarnine Phthalate.
Cremor Magnesiæ.
Di-iodo-iso-propyl Alcohol.
Elixir Calcii Chloridi.
Elixir Pepsini, Bismuthi et Strychninæ.
Erythrophleine (Dental use).
Extracti Gossypii Seminis Pulvis.
Ferri Carbonas Saccharatus Concentratus.
Fluoroform.
Food Preparations (new monograph), including :—
Almo Foods,
Casumen,
Dried Milk,
Lacumen,
Lacvitum,
Virogen.
Formic Acid, Formates and Galenical preparations of same (new monograph).
Gold Salts, the varieties of commerce are specified.
Glutoid Capsules.
Glycerinum Acidi Hydriodici.
Glycerole of Glycerophosphates, with Red Bone Marrow.
Hamamelis Preparations, with comparisons between those of U.S. and B.P.
Infusa Concentrata (new monograph).
Iodic Acid and its Salts (new monograph).
Iodoform Bone Plugging
Liquid Iodoform Soap.
Iodinol cum Extracto Malti.
Isopral.
Lactates, several.
Levure Medicinale.
Linimentum Olei Crotonis.
Malted Glycerophosphates.
Magnesii Hydroxidum.
Magnesii Hydroxidum cum Carbone.
Mercurial Injections fully treated,—the relative advantages of the insoluble and soluble forms pointed out.
Mercuric Iodate.
Nebulæ.—Working formulæ given for all Compounds.
Nickel & Salts.—Bromide, Sulphate, etc. (new monograph).
Novocaine.
Oleogen Compounds.
Oleum Crotonis (new monograph).
Oleum Ricini Aromaticum.
Ortho-coumaric Acid.
Ovules for gynecological use with Glyco-Gelatin and Cacao Butter bases (new monograph).

Parogens.
Pastilli Pepsinæ.
Pepsin Jelly.
Perborates.
Piperazine Glycerophosphates.
Proponal.
Quinine Formates.
Quinine Lygosinate.
Radiology and Radium Therapy, revised, including recent suggestions for treatment, standardisation and dosage, and the latest theoretical considerations.
Salts, Mineral, Factitious, Ph. Ned.
Sapones, methods of manufacture outlined.
Sarsaparilla Decoctions (new monograph).
Sedeff.
Soaps, Superfatted, Ph. Ned. Formulæ.
Sodium Citrate Tablets.
Sodium Ortho-coumarate Solution for injection.
Solanaceous Alkaloids, the latest results given.
Solurol (Thyminic Acid).
Syrupus Pilocarpinæ et Potassii Bromidi.
Syrupus Tann-Iodo Phosphoratus.
Tablets, practical methods of manufacture detailed (new).
Tabellæ Antiasthmaticæ.
Tabellæ QuininæTannatis.
Thorium Salts, radioactive (new monograph).
Trypsin treatment of cancer, sarcoma, and malignant growths.
Tylmarin.
Unguentum Iodi Intinctum.
Vinum Tann-Iodo-Phosphoratus.
Zinc Iodate.

An **Alcohol Table** to show the Percentage by Weight and by Volume from the Specific Gravity, and rules for Alcohol strength Dilution and Conversion are given.

In the section on **Organotherapy,** preparations of the Duodenal membrane, Suprarenal and Thyroid Glands, and the method of treatment by the Inspissated Milk and Blood of Thyroidectomised Animals have received careful attention. In the section on **Antitoxins** the subjects of anthrax (Sclavo's Serum) malaria, plague, cancer, gonorrhœa, leprosy, tetanus, trypanosomiasis, tuberculin, vaccine, &c., have all been brought up to date in the light of recent researches; the latest views on **Opsonins** are described. **Analytical Memoranda** have undergone revision. The method of examining blood and urine by determining the freezing point, the Precipitin test for blood, and a number of new stains have been added, including Sir A. E. Wright's modification of Leishman's Stain. In the **Bacteriological** section notes on the organisms of filaria, dysentery, trypanosomiasis, malaria, yellow fever, influenza, plague, ringworm, and relapsing fever are added, and some details on the parasitic organisms of skin diseases and Giemsa's method for staining the spirochete of syphilis are included.

A large number of prosecutions have occurred during the last two years under the Sale of Food and Drugs Act, and considerable attention has been paid to methods of **Standardisation of Galenical preparations.** We have introduced and defined the necessary requirements in many instances. *Percentage of 'Extractives,' Total Solids, Specific Gravities, Alcohol Strengths* of liquid preparations, *Ash Percentages* of drugs and similar memoranda will be found in more detail, and we have given approved methods for the determination of purity and the detection of preservatives. The Recommendations of the Royal Commission on Arsenical poisoning, and the resulting discussions and criticisms are stated. Similarly, the methods employed for the detection of Boric Acid and Formalin in milk, Salicylic Acid and Boric Acid in foods, for estimation of lead in Tartaric and Citric Acids are provided. The estimation of the *Iodine* and *Saponification Numbers* of fats has been summarised; the *Chemical Analysis of Milk* and the *Bacteriological Examination of Water* are outlined.

[For recent work on Testing and Standardisation of Drugs and Chemicals, see ***P.J. i./05***,213 (Editorial on Adulteration Laws); 323 (Camphorated Oil); 398 (Belladonna); 435 (Table of figures for Official Galenicals); 691 (Umney refers to his 'Standards for Medicines,' 1902); ***P.J. ii./05***,111 (Editorial); 155 (Physiological Tests); 139,163 (on the U.S.P.); 92,114 (C. A. Hill, General Discussion); 123 (Naylor, Presidential Address); 313 (*Medical Press* on Naylor's Address); 520,579 (Gadd on Belladonna, Liquorice, Jalap, Ipecacuanha, Rhubarb, Valerian, Ginger, Cinchona); 900 (Testing for Dispensing Chemists); ***P.J. i./06***,197 (Kirkby, Evolution of Pharmacopœial Standardisation—General Discussion—Pharmacological Progress is laggard). And the 'Conference' No. of the P.J., July 28, 06.]

The **Therapeutic Index** has been rearranged and greatly extended, and the qualifications for introduction of new substances have been carefully weighed before assigning them a place in this section of the book to which we believe medical men are in the habit of making frequent reference.

The arrangement of the text has also undergone revision. We have placed in special type in the more lengthy monographs such headings as:—***Antidotes, Manufacture, Solubilities, Uses, Incompatibilities,*** etc.

The section on **Radiology** has been brought fully up to date in the light of the latest methods and results.

A Bill intituled an Act to regulate the sale of certain poisonous substances, and to amend the Pharmacy Acts, has been passed by the House of Lords, and has been read the first time in the House of Commons (June 13th, 1906). This Bill embodies legislation as to Company trading in Pharmacy, Licensed Dealing in Agricultural poisons by unregistered persons, and the Sale of Mineral Acids; but the second reading had not been reached at the time of going to press.

The question of the **Physiological Standardisation** of certain drugs, *e.g.*, Digitalis, Strophanthus, Ergot and Indian Hemp, has received considerable attention of late, and it is obvious that an assay of potent drugs, whose active principles cannot be accurately and rapidly determined (as is the case with those not containing definite crystallisable alkaloids) would be most desirable. For the conduct of such physiological standardisation a National Institution would in our opinion be required. An outline of the method now employed appears in this edition, abstracted from the National Standard Dispensatory.

In conclusion we may add that the reports now issued by all the countries represented at the Conference for the Unification of Pharmacopœial Formulæ of Potent Drugs and Preparations, held at Brussels in 1902, lead to the conclusion that uniformity in the composition of preparations of potent medicines will ultimately be assured.

The authors will at all times be glad to receive suggestions intended to make this volume of greater use to the physician and surgeon, the pharmacist, and the manufacturing chemist; they will also be grateful to readers who point out any errors which may have crept into the text or the index of the work.

W. H. MARTINDALE,

10, New Cavendish Street, W.

WM. WYNN WESTCOTT,

396, Camden Road, N.

August 1st, 1906.

INTRODUCTION.

HERein medicines are viewed from a pharmaceutical and medical aspect; references to their use, with the doses employed, are given in *précis*. The area of selection is limited by personal experience. Modern official drugs are still noticed, and older ones are introduced when unofficial preparations of them are in use, or their preparations have undergone alteration. In the Secondary List of Drugs will be found those to which medical attention has been more or less directed, but which have not come into very extended use. The List contains in addition a number of those official drugs and preparations for which we deemed the small type and condensed paragraph suitable, with a resulting saving of space. The Index forms a copious Posological Table. The doses are based on personal experience, or are culled from the best authorities. The terms *Drachm* and *Ounce*, when applied to liquids, are understood to be the Fluid Drachm and Fluid Ounce respectively, as defined by the British Pharmacopœia. Except in some foreign formulæ where liquids are ordered to be weighed, when parts are referred to (solubilities included), it is to be understood that ounces and fluid ounces, grains and grain-measures, or grammes and cubic centimetres are to be employed. In regard to the formulæ for hypodermic injections and several others, as a minim is not equal to a grain-measure, and as hypodermic syringes and dispensing measures are graduated in minims, for practical purposes the use of 'parts' is generally avoided when referring to these small quantities. They are therefore ordered in grains and minims or ounces (*i.e.* fluid ounces); thus Injectio Morphinæ Acetatis Hypodermica contains 1 grain of Morphine Acetate in 6 minims. Exceptions to this rule are clearly indicated. Specific gravities and solubilities have been determined at 15·5° C. (60° F.). (U.S.P. mostly employs 25° C.)

Percentage solutions are sometimes mentioned, by which it is intended that 100 grain-measures of the finished solution shall contain *n* grains of the substance, or that 100 Cc. shall contain *n* Gm.; *e.g.* a 50 per cent. solution of Cocaine Hydrochloride will contain 50 grains in 100 grain-measures, and will dilute with an equal volume of liquid to form a 25 per cent. solution. For conversion table, *v.p.* 890.

ABBREVIATIONS.

When the reference is to a periodical, the number put first is the number of the volume; then follow the last two figures of the year, and the last number refers to the page, thus, B.M.J. ii./05,100.

Allen.—Allen's Commercial Organic Analysis.

Am.Jl.Ph.—American Journal of Pharmacy.

Arzn.—Arzneimittel die im Deutschen Arzneibuch nicht enthalten sind, 1897.

Batty Shaw.—Organotherapy, or Treatment by means of Preparations of Various Organs. H. Batty Shaw, M.D., F.R.C.P., 1905.

B. & C. D.—British and Colonial Druggist.
B.M.J.—British Medical Journal.
B.M.J.E.—British Medical Journal Epitome.
Bosanquet.—Serums, Vaccines and Toxines in treatment and diagnosis, W. Cecil Bosanquet, M.D., 1904.
B.P.C.—Formulary, 1901, of the British Pharm. Conference.
Brompton H.—Pharm. Brompton Hospital, 1899.
Brunton.—Text-Book of Pharmacology, Therapeutics, and Materia Medica, by Sir T. Lauder Brunton, M.D.
B.S.H.—Pharmacopœia of the British Skin Hospital, 1884.
Caspari.—Pharmacy for Students and Pharmacists, C. Caspari, jun., 1906.
C.D.—Chemist and Druggist.
C.L.T.E.—Central London Throat and Ear Hosp. Pharm. 1901
Chem. News.—Chemical News.
Clin. Jl.—Clinical Journal.
Codex.—Codex Medicamentarius, Pharmacopée Française, 1884. (A New Edition promised in 1907.)
C.U.D.—International Conference for the Unification of Pharmacopœial Formulæ of Potent Drugs and Preparations, Proposals adopted by. Brussels, 1902.
Cushny.—Text Book of Pharmacology and Therapeutics, Arthur R. Cushny, M.A., M.D., 1906.
D.M.W.—Deutsche Medizinische Wochenschrift. Leipzig.
Dixon.—Manual of Pharmacology. W. E. Dixon, 1906.
E.L.—Pharm. of East London Hospital for Children.
Ed.M.J.—Edinburgh Medical Journal.
F.E.—Farmacopea Española. Septima Edicion, 1905. Madrid.
F.Ital.—Farmacopea d'Italia, 1902.
F.N.—Formulaire des Medicaments Nouveaux. Bocquillon-Limousin, 17th Edition, 1905; 18th Edition, 1906. Paris.
G.—The Essentials of Materia Medica and Therapeutics, by Sir A. B. Garrod, M.D., and N. J. C. Tirard, M.D.
Gould.—Gould and Pyle's Pocket Cyclopædia.
G.H.—Pharmacopœia of Guy's Hospital, 1899.
G.N.C.—Pharm. Gt. Northern Central Hospital, 1899.
Gt. Orm. H.—Gt. Ormond St. Hosp. Children Pharm., 1900.
Hager.—Handbuch der Pharmaceutischen Praxis. 1903.
H.—Text Book of Practical Therapeutics. Hobart Amory Hare. Edn. XI., 1905.
H.W.—W. Hale White, M.D., Materia Medica, Pharmacy, Pharmacology and Therapeutics, 1905.
I.C. Add.—Indian and Colonial Addendum (1900) to the British Pharmacopœia, 1898.
I.M.G.—Indian Medical Gazette.
I. Wts.—International Atomic Weights, 1906.
J.C.S.A.—Journal of the Chemical Society. Abstracts.
J.C.S.T.—Journal of the Chemical Society. Transactions.
J.R.S.—Journal of the Roentgen Society.
K.C.H.—King's College Hospital Pharmacopœia, 1901.
L.—The Lancet.
L.H.—Pharmacopœia of the London Hospital, 1901.
L.L.—London Lock Hospital Pharmacopœia, 1896
M. Arch.—Merck's Archives. New York.
M.—Annual Report of E. Merck.
M.A.—Medical Annual, 1901, 1902, 1903, 1904, 1905, 1906.
Med. Rec.—Medical Record, New York.

M.C.—Medical Chronicle, Manchester.
Mid. H.—Pharm. Middlesex Hospital, 1899.
M.P.C.—The Medical Press and Circular.
M.T.G.—The Medical Times and Gazette.
Murrell.—"What to do in Cases of Poisoning," William Murrell, M.D.
Na.—"Nature," London.
N.H.W.—Pharmacopœia of the New Hospital for Women, London, 1904.
N.S.D.—National Standard Dispensatory, 1905.
Off.—*Official*—in the British Pharmacopœia.
Oph.—"The Ophthalmoscope," London.
P. Austr.—Pharmacopoea Austriaca, vii ; 1906.
P. Aus. Add.— ,, ,, ,, 1900 Additamenta.
P. Belg.—Pharmacopoea Belgica, Editio Tertia, 1906.
P. Dan.—Pharmacopoea Danica, 1893.
P.G. IV.—Pharmacopoea Germanica, editio IV., 1900.
P. Helv.—Pharmacopoea Helvetica, Ed. III., 1893. A new edition promised 1907.
Ph.—Pharmacopedia. White and Humphrey, 1904.
Ph. Form. — Pharmaceutical Formulæ, 1905. Peter MacEwan, Ph.Ch., F.C.S., "The Chemist & Druggist."
Ph. Ned.—Pharmacopoea Nederlandica, Editio Quarta, 1906.
P.J.—Pharmaceutical Journal.
P. J. F.—Pharmaceutical Journal Formulary.
P. Jap.—Pharmacopoea Japonica, editio altera, *i.e.* II., 1891.
P.L.—Pharmacopœia Londinensis, 1851.
Pr.—The Practitioner.
Proc. Chem. Soc.—Proceedings of the Chemical Society.
R.—Handbook of Therapeutics, by Sydney Ringer, M.D. and Harrington Sainsbury, M.D.
R.F.H.—Pharmacopœia of the Royal Free Hospital, 1904.
R.D.H.—Pharm. of Royal Dental Hospital, 1905.
R.O.H.—Pharmacopœia of the Royal London Ophthalmic Hospital, 1901.
Smale and Colyer.—Diseases and Injuries of the Teeth.
St. Bart.'s H.—Pharm. St. Bartholomew's Hospital, 1900.
St. G. H.—Pharm. St. George's Hospital, 1899.
St. J. H.—Pharm. St. John's Hospital for Skin Diseases, 1904.
S.H.—Pharm. Samaritan Free Hospital, 1899.
St. M.'s H.—Pharm. of St. Mary's Hospital, 1904.
St. Th. H.—Pharm. St. Thomas' Hosp., 1902.
T.H.—Pharmacopœia of the Hospital for Diseases of the Throat (Golden Square), 6th ed. 1901.
Th.Gaz.—Therapeutic Gazette, Philadelphia.
Therap.—The Therapist.
U.C.H.—Pharm. of the University College Hospital, 1904.
U.S.—Pharmacopœia of the United States, 1900 (Official September, 1905).
U.S.N.F.—American Pharm. Association, National Formulary of Unofficial Preparations.
Vic. Park.—Pharm. City of London Hosp. (Chest), 1900.
V.H.C.—Pharm. Victoria Hosp. for Children, 1904.
W.H.—Westminster Hospital Pharmacopœia, 1902.
Y.B.—The Year-Book of Treatment.
Y.B.P.—The Year-Book of Pharmacy, 1903, 1904, 1905.

WEIGHTS AND MEASURES.

THE British Pharmacopœia in 1898 adopted a dual system of weights and measures in all its formulæ, namely, the Imperial Weights and Measures and the Metric System.

"Except for wholly insignificant fractional differences, 'a preparation made according to either system will contain 'the same proportions of ingredients; but, as a matter of 'course, the two systems cannot both be used in the same 'operation."

"The Pharmacopœia, as hitherto customary, employs 'Imperial measuring vessels graduated at 62° F. (16·7° C), and 'the official names of Imperial capacity-units as defined at 'that temperature, together with the official names of 'metric capacity-units as defined at 39·2° F. (4° C.); while it 'employs metric measures and volumetric vessels graduated 'at 60° F. (15·5° C.)."

In this work are given formulæ in 'proportional parts,' solids by weight, and liquids by *measure*, as the dispensing of liquids in Great Britain is always conducted by measuring. Exceptions to this rule are in the abstracted formulæ, and those from unofficial sources (in order not to interfere with the strict accuracy of either); that is, the denomination in other formulæ is omitted. In those, therefore, in which 'proportional parts' are used, the quantities of solids and liquids at 60° F. (15·5° C.) may be taken respectively in grammes and cubic centimetres, ounces and fluid ounces, grains and (to be strictly accurate) grain measures, but minims in place of the latter will, for practical purposes, often be used, and only cause one-eleventh *minus* error.

In the body of the work (but not in the Secondary List or Index) the approximate doses of each drug and preparation in terms of the metric system follow those of the Imperial

system. For all practical purposes, a fluid drachm may be considered as 3½ cubic centimetres; 60 grains as 4 grammes; the avoirdupois ounce (about 28⅓ grammes) may be taken as 30 grammes; the fluid ounce as 30 cubic centimetres; and the pound avoirdupois as half a kilogramme (approximately it is nine-twentieths).

In further trying to think in the metric system, prescribers may consider the English grain as 65 milligrammes (0·065 gramme), 1½ grains as 10 centigrammes, and 17 minims as approximately 1 cubic centimetre. (See tables pp. xxi. and xxii.)

The following approximations will also be useful:—

85 minims = 5 Cc.* = 1 teaspoon.

255 minims = 15 Cc.* = { 3 teaspoons / 1 tablespoon.

1020 minims = 60 Cc. = { 12 teaspoons / 4 tablespoons / 1 wineglass.

250 Cc. = 50 teaspoons = { 16 tablespoons (about), / 4 wineglasses, / 1 tumbler.

The word gramme is contracted to **Gm.**, and the words cubic centimetre to **Cc.** The contraction **Gm.** in heavy type and with a capital initial letter distinguishes it from gr., the usual contraction for grain. The latter is only used in the index.

A further exception is made in the case of hypodermic injections. To avoid, also, too great confusion of the two systems the contents of the unofficial ophthalmic lamels are not given in metric terms.

It would be of general advantage if the English term minim (commonly but erroneously understood to be a drop of liquid) were abandoned as it has been in all other scientific work.

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* These quantities are respectively those recognised by the French Codex for a teaspoonful and a tablespoonful.

A patient's metric dose glass, cylindrical in shape, 20 Cm. high and 2 Cm. wide, graduated in parts, 1, 2, 4 and 8, each part being equal to 2·5 Cc. (or 42 minims approximately), has been arranged.—B.M.J. ii./04,1571.

A drop, as the late W. Martindale suggested (P.J. 1876,679), might be considered as $\frac{1}{20}$ of a cubic centimetre, or about $\frac{7}{8}$ of a minim.

Of mobile liquids, such as Ether, Chloroform, Tincture of Digitalis, Almond Oil, and Oleic Acid, a drop is much smaller than that of water (varying, of course, with the neck of the bottle from which it is dropped). In the case of Oleic Acid, Almond, Olive, and other light oils, the 'drop,' on an average, weighs half a grain, and in place of weighing small quantities of these, two drops may for practical purposes be considered as the equivalent of one grain.

At the International Congress for the Unification of Pharmacopœial Formulæ of Potent Drugs and Preparations held at Brussels in 1902, it was decided that the Drop Measure should have an outside diameter of 3 mm., and give (at the temperature of 15°C.) 20 drops of distilled water weighing 1 Gm.—B. & C.D.ii./02,300.

The Farmacopea Oficial Española, 1905, gives a drop measure table, *v.p.* 898 (number of drops in a Gm. of different medicaments).

The measure of 1,000 cubic centimetres recognised by the Pharmacopœia is not the same thing as a litre, which is the volume of 1,000 grammes of distilled water at its temperature of maximum density, 4° C. and 760 mm. barometric pressure (B.P. p. 430), whereas the measure of 1,000 cubic centimetres, B.P., is the volume occupied by 1,000 grammes of distilled water at 15·5° C., the difference being that 1 cubic centimetre is stated to be equal to 0·99984 millilitre, a millilitre therefore equals 1·00016 Cc. In the operations of the Pharmacopœia the volume of 1,000 grammes at 15·5° C. is directed to be employed in the place of the standard litre.

The millilitre has been contracted to the term 'mil.' Pipettes are made delivering one mil, one decimil, and one centimil. These terms will probably be used in the next B.P.—P.J. ii./04, 800, 923; ii /05, 3.

The old apothecaries' and avoirdupois weights should be abandoned—and it is claimed the

change could be rapidly effected. It is necessary to calculate in metric terms; for example, to realise that the dose of arsenious acid is from 1 to 5 milligrams, that of Tincture of Opium the single dose is one to two cubic centimetres, that Sodium Bicarbonate is given in quantities of ½ to 2 Gm. and so forth, and the entire system will be quickly assimilated.

The Farmacopea Oficial Española, 1905, adopted the metric system exclusively to replace the Apothecaries' Weights of the 1884 Edition.

It is time that the practice which has grown up of burdening the prescriber with metric equivalents to grains, drachms and ounces should be dropped in favour of metric terms only, which entail far less mental calculation, and hence involve very much less likelihood of error.

It is to be regretted that the Metric System does not seem to be accepted with any great favour by medical men, yet there are unmistakable signs that our readers recognise the utility of the system.

The sizes of bottles in most frequent use in France are:—

1,000, 500, 250, 200, 125, 100, 50 and 25 cubic centimetres.

Mixtures may be prescribed in 125, 200, or 250 Cc., or where it is desired to prolong the treatment 500 Cc. is a convenient size; and drops should be ordered in quantities of 60, 30, and 15 Cc.

Memoranda.

Ratio of circumference of a circle to its diameter $= \pi = 3{\cdot}14159$. Circumference of a circle $= 2\pi r$.

Area of a Triangle with base a and height $h = \frac{1}{2} a h$.

Volume of a Cube with length $l = l^3$.

Volume of a Cylinder $= \pi r^2 h$. If r and h be in inches this divided by 277·278, the result is in gallons (water).

Volume of a Pyramid $= \frac{\pi r^2 h}{3}$

Volume of a Sphere $= \frac{4}{3} \pi r^3$

1 gallon of Water weighs 10 pounds; 1 gallon contains 77·278 cubic inches.

Examples of Metric Prescriptions.

(From a current Prescription Book.)

℞ *Bismuthi Salicylatis* ... ... 8·0 *Gm.*
Sodii Bicarbonatis ... ... 8·0 ,,
Acidi Hydrocyanici diluti ... 3·0 *Cc.*
Tincturæ Nucis Vomicæ ... 7·0 ,,
Spiritus Chloroformi ... ... 14·0 ,,
Aquæ Menthæ Piperitæ *ad* 200·0 ,,
Dose.—One tablespoonful (15 *Cc.*).

℞ *Potassii Bromidi* ... ... 10·0 *Gm.*
Liquoris Morphinæ Hydrochloridi 5·0 *Cc.*
Syrupi Limonis ... ... 20·0 ,,
Aquam ... ... *ad* 250·0 ,,
Two tablespoonfuls (30 *Cc.*) *every three hours.*

℞ *Cocainæ Hydrochloridi* ... 0·005 *Gm.*
Morphinæ Hydrochloridi ... 0·003 ,,
Massæ Theobromatis, q.s. ut fiat
Tabella ponderis 0·15 *Gm. quarum mitte* X.
Signa.—One when the cough is troublesome, but not more than 5 *times in* 24 *hours.*

℞ *Ichthyol* ... ... 0·15 *Gm.*
Sodii Glycerophosphatis ... 0·3 ,,
Pepsini ... ... 0·15 ,,
Papainæ ... ... 0·15 ,,
Fiat Capsula Gelatinæ : mitte tales 150.

℞ *Extracti Damianæ* .. ... 0·1 *Gm.*
Extracti Nucis Vomicæ ... 0·015 ,,
Pepsini ... ... 0·1 ,,
Phosphori ... ... 0·0005 ,,
Fiat pilula quarum mitte ducenti. Signa,—i. *t. d. s.*

℞ *Potassii Chloratis* ... ... 15·0 *Gm.*
Glycerini ... ... 15·0 *Cc.*
Tincturæ Cocci ... ... 5·0 ,,
Aquam ... ... *ad* 250·0 ,,
Fiat gargarisma pro re nata utendum.

℞ *Hydrargyri Oxidi Flavi* ... 0·05 *Gm.*
Acidi Borici... ... ... 0·2 ,,
Cocainæ Hydrochloridi ... 0·05 ,,
Paraffini Mollis ... ...*ad* 15·0 ,,
Fiat unguentum.

℞ *Acidi Acetici* ... ... 15·0 *Cc.*
Resorcini ... ... 10·0 *Gm.*
Aquæ Coloniensis ... ... 60·0 *Cc.*
Acidi Carbolici ... ... 2·0 *Gm.*
Aquæ Rosæ ... *ad* 250·0 *Cc.*
Fiat lotio pro capite.

METRIC WEIGHTS AND MEASURES AND THEIR EQUIVALENTS IN THE BRITISH PHARMACOPŒIA.

1 Gramme (Gm.)	= 15·4323564 grains.
1 Centigramme (Cgm.)	= 0·154323 grain.
1 Milligramme (Mgm.)	= 0·015432 grain.
1 Litre	= 35·196 fluid ounces.
1 Cubic Centimetre (Cc.) ...	= 16·95 minims (nearly).
1 Metre	= 39·370113 inches.

The following will probably be used in the next B.P. (*vide antea*):—

1 Mil	= 1 millilitre, $\frac{1}{1000}$ litre.
1 Decimil	= $\frac{1}{10}$ mil.
1 Centimil	= $\frac{1}{100}$ mil.

The Gramme has its decimal multiples—Decagramme, Hectogramme, and Kilogramme; and divisions—Decigramme, Centigramme, and Milligramme. The Litre and Metre have their corresponding decimal divisions—Decilitre, Centilitre, and Millilitre,—and Decimetre, Centimetre, and Millimetre.

In Continental States, where this system is now generally adopted for the dispensing and preparing of medicines, all liquids are weighed, and the terms Gramme, Centigramme, and Kilogramme only are used. This avoids the possibility of errors, which the similarity of the names Decagramme and Decigramme might lead to.

In Germany the quantities of the ingredients in prescriptions are written in decimal proportions, the gramme being understood to be the unit; the name of the integer is generally not mentioned, thus:

Rhubarb 35· means 35 grammes of Rhubarb.

,, ·035 ,, 35 milligrammes

APPROXIMATE EQUIVALENT DOSES.

WEIGHTS. IMPERIAL TO METRIC.

$\frac{1}{100}$	gram	.	...	=	0·00065	gramme
$\frac{1}{64}$	,,	...	...	=	0·001	,,
$\frac{1}{50}$	,,	...	...	=	0·0013	,,
$\frac{1}{40}$	,,	...	...	=	0·0016	,,
$\frac{1}{32}$	,,	...	...	=	0·002	,,
$\frac{1}{30}$	,,	...	...	=	0·0022	,,
$\frac{1}{25}$	,,	...	...	=	0·0026	,,
$\frac{1}{20}$	,,	...	...	=	0·0032	,,
$\frac{1}{16}$	,,	...	...	=	0·004	,,
$\frac{1}{12}$	,,	...	...	=	0·0054	,,
$\frac{1}{10}$	,,	...	...	=	0·0065	,,
$\frac{1}{8}$	,,	...	...	=	0·008	,,
$\frac{1}{6}$	,,	...	...	=	0·01	,,
$\frac{1}{5}$	,,	...	...	=	0·013	,,
$\frac{1}{4}$	,,	...	...	=	0·016	,,
$\frac{1}{3}$	,,	...	...	=	0·02	,,
$\frac{1}{2}$	,,	...	...	=	0·032	,,
$\frac{3}{4}$	,,	...	...	=	0·05	,,
1	,,	...	...	=	0·065	,,
$1\frac{1}{2}$	grains	...	...	=	0·1	,,
2	,,	...	...	=	0·13	,,
3	,,	...	...	=	0·2	,,
4	,,	...	...	=	0·26	,,
5	,,	...	...	=	0·32	,,
6	,,	...	...	=	0·4	,,
7	,,	...	...	=	0·46	,,
8	,,	...	...	=	0·52	,,
9	,,	...	...	=	0·6	,,
10	,,	...	...	=	0·65	,,
12	,,	...	...	=	0·8	,,
15	,,	...	..	=	1·0	,,
20	,,	...	...	=	1·3	grammes
24	,,	...	...	=	1·5	,,
30	,,	...	...	=	2·0	,,
40	,,	...	...	=	2·6	,,
60	,,	...	...	=	4·0	,,
90	,,	...	...	=	6·0	,,
120	,,	...	...	=	8·0	,,
$\frac{1}{2}$	ounce (av.)		...	=	15·0	,,
1	,,	,,	...	=	30·0 (*or nearer* 28·35)	,,
1	pound	...	...	=	453·59	,,

WEIGHTS. METRIC TO IMPERIAL.

1 kilogramme	... ...	= 2 lb. 3¼ oz.
500 Gm.	... ...	= 1 „ 1⅝ „
100 „	... ...	= 3½ oz.
25 „	... ...	= ⅞ „
10 „	... ...	= ⅓ „
1 „	... ...	= 15·43 grains.
½ „	or 500 milligrammes	= 7·7 „

MEASURES. IMPERIAL TO METRIC.

½ minim	= 0·03 Cc.	40 minims	= 2·4 Cc.
1 „	= 0·06 „	50 „	= 3·0 „
2 minims	= 0·12 „	60 „	= 3·5 „
3 „	= 0·18 „	80 „	= 4·7 „
4 „	= 0.24 „	90 „	= 5·3 „
5 „	= 0·30 „	100 „	= 6·0 „
6 „	= 0·35 „	120 „	= 7·0 „
7 „	= 0·42 „	240 „	= 15·0 „
8 „	= 0·5 „	1 fluid oz.	= 30·0 „
9 „	= 0·54 „	2 fluid ozs.	= 60·0 „
10 „	= 0·6 „	4 „ „	= 115·0 „
12 „	= 0·7 „	5 „ „	= 140·0 „
15 „	= 0·9 „	6 „ „	= 170·0 „
17 „	= 1·0 „	8 „ „	= 230·0 „
20 „	= 1·2 „	10 „ „	= 280·0 „
25 „	= 1·5 „	20 „ „	= 568·0 „
30 „	= 1·8 „	1 gallon	= 4·546 litres

MEASURES. METRIC TO IMPERIAL.

1 Cc.	...	= 17 minims
1 litre	...	= 1 pint 15 fl. oz. approx.

MEASURES OF LENGTH.

1 micron = $\frac{1}{1000}$ millimetre or $\frac{1}{1000000}$ metre
1 millimetre = 0·039370 inch
1 centimetre = 0·3937 inch
1 decimetre = 3·937 inches [inches nearly.
1 metre = 39.370113 inches or 1 yard 3·37

ABBREVIATIONS.—I., *India*; A.C., *African Colonies*; Au.C., *Australasian Colonies*; E.C., *Eastern Colonies*; M.C., *Mediterranean Colonies*; N.A.C., *North American Colonies*; W.I.C., *West Indian Colonies*; P.I., *Pharmacopœia of India*, 1868; E.P.I., *Economic Products of India*, 1889-96; Pg.I., *Pharmacographia Indica*, 1890-93.

Drug or Preparation.	Dose.	Source and where official.	Description, part used, or menstruum and strength.	Properties and References.
Acaciæ Cortex, BLACK WATTLE BARK from *A. decurrens*)	.....	*A. arabica* and *decurrens*. I., Au.C., E.C.	Dried bark kept for one year...	Astringent=Oak bark.—E.P.I. i. 21; Pg.I. i. 550, 556.
Decoctum	½ to 2 oz.		Water, 1 in 16	
Acalypha	.....	*A. indica*	Fresh or dried herb	Expectorant, emetic, laxative=Senega or Broom.—P.I. 205; E.P.I. i. 62
Ext. Liquidum	5 to 30 m.	I., E.C.	Alcohol 90 %, 1=1	
Succus	1 to 4 dr.	(*Euphorbiaceæ*).	Fresh juice, ¼th alcohol 90 %	
Adhatoda	.....	*A. Vasica*.	Fresh or dried leaves	Expectorant and antispasmodic, contains Vasicine, a bactericide.—P.I. 162; E.P.I. i. 109; P.J. 1888, 841; Pg.I. iii. 291; L. ii./oo,327.
Ext. Liquidum	20 to 60 m.	I., E.C.	Dried leaves, alcohol 60%, 1=1	
Succus	1 to 4 dr.	(*Acanthaceæ*)	Fresh juice	
Tinctura	30 to 60 m.		Dried leaves, perc. alc. 60 % 1 in 8	
Agropyrum, TRITICUM or COUCH GRASS	.....	*A. repens* (*Triticum repens*).	Dried rhizome.....	Diuretic and aperient.—Pg.I. iii. 50. p. 704.
Decoctum	½ to 2 oz.	Au.C., E.C.,	Water, 1 in 20	Contains triticin, a carbohydrate similar to inulin.
Ext. Liquidum	1 to 2 dr.	[N.A.C.	Boiling water, ¼ alc. 90% 1=1	
Alstonia, (DITA BARK from *A. scholaris*)	.....	*A. scholaris* I., E.C., and *A. constricta*. (*Apocynaceæ*) Au.C.	Dried bark	Tonic, in dysentery.—P.I. 137; E.P.I. i. 197; Pg.I. ii. 386. p. 726.
Infusum	½ to 1 oz.		Boiling water, 30 minutes, 1 in 20	Dose of Tr. A. Constricta is less, 5 to 20 m.—P.J. i./01, 362.
Tinctura	½ to 1 dr.		Alcohol 60%, macerate 1 in 8	
Andrographis (CREYAT, KIRYAT)	.....	*A. paniculata*. I., E.C.	Dried plant	Stomachic and bitter tonic=Chiretta.—P.I. 161,459; E.P.I. i. 240; Pg.I. iii. 46. p. 738.
Infusum	½ to 1 oz.	(*Acanthaceæ*).	Boiling water, 15 minutes, 1 in 20	
Liquor Concentratus	½ to 1 dr.		Alcohol 20 %, 1 in 2.	
Tinctura	½ to 1 dr.		Alcohol 60 %, percolate	

Drug or Preparation.	Dose.	Source and where official.	Description, part used, or menstruum and strength.	Properties and References.
Aristolochia	.....	*A. indica.*	Dry stem or root	Tonic stimulant = Serpentary. A remedy for snake bites.—P.I. 198, 461; E.P.I. i. 315; Pg.I. iii. 158.
Liquor Concentratus	½ to 2 dr.	I., E.C.	Alcohol 20 %, 1 in 2	
Tinctura	½ to 1 dr.	(*Aristolochiaceæ*)	Alcohol 70 %, percolate 1 in 5	
Arnicæ Flores (U.S.) ...	.....	*A. montana.*	Dried flower heads	Acrid stimulant = Arnica rhizome.
Tinctura	½ to 1 dr.	N.A.C.	Alcohol 45 %, percolate 1 in 10	(Tincture U.S. 1 in 5 diluted alcohol.)
Aurantii Cortex Indicus	.....	*Citrus Aurantium* I., E.C.	Fresh and dried peel of fruit (*Rutaceæ*).	Mild tonic, stomachic.—Pg.I. i. 269. p. 164.
Azadirachta Indica, NEEM, or MARGOSA BARK	.....	*Melia Azadirachta.* I., E.C.	Dried bark of stem	Tonic (in round worm), antiperiodic = Quassia.—P.I. 55, 443; E.P.I. v. 214; Pg.I. i. 322, 547.
Infusum	½ to 1 oz.	(*Meliaceæ*).	Cold water, 15 minutes, 1 in 100	
Tinctura	½ to 1 dr.		Alcohol 45 %, macerate 1 in 10	
Belæ Fructus, BAEL FRUIT	.....	*Ægle marmelos.* I., E.C	Fresh half-ripe fruit	Mild astringent.—P.I. 46; E.P.I., i. 120; Pg.I. i. 277, 547. Fresh fruit useful in dysentery.–L.i./02,66.
Ext. Liquidum	1 to 2 dr.	(*Rutaceæ*).	Cold water, ¼th alc. 90%, 1=1	
Berberis	.....	*B. aristata.*	Dried stem	Tonic. Extract known as 'Rusot' in India. P.I. 12; E.P.I. i., 442; Pg. I. i. 64. Fully described.—P.J. ii./04,473.
Liquor Concentratus	½ to 1 dr.	I., E.C.	Alcohol 20 %, 1 in 2	
Tinctura	½ to 1 dr.	(*Berberidaceæ*)	Alcohol 60 %, percolate 1 in 10	
Betel	.....	*Piper betle.* I., E.C. (*Piperaceæ*).	Dried leaves.....	Stimulant, narcotic, masticatory.—P.I. 208; E.P.I. vi. pt. 1, 254; Pg.I. iii. 183.
Buteæ Gummi, BUTEA GUM, BENGAL KINO.	.....	*B. frondosa.* I, E.C.	Inspissated juice from stem ...	Astringent.—P.I. 73. Contains Tannin Compound powder 3 in 4.
Buteæ Semina	.....	*B. frondosa.*	Seeds	Contain Moodooga Oil. Anthelmintic like Santonin.—P.I. 79, 446; E.P.I. i. 550; Pg.I. i. 454.
Pulvis	10 to 20 gr.	I., E.C. (*Leguminosæ*).	Dried kernels freed from testæ	
Calotropis ..... MUDAR	3 to 10 gr. Emetic: 30 to 60 gr.	*C. procera* and *C. gigantea.* I., E.C.	Root Bark freed from outer layer	Tonic, emetic.—P.I. 141, 457; E.P.I. ii. 43; Pg.I. ii 428. For dysentery.
Tinctura	½ to 1 dr.	(*Asclepiadaceæ*)	Alcohol 60 %, percolate 1 in 10	
Cambogia Indica	½ to 2 gr.	*Garcinia morella.* I., E.C.	Gum-resin, about ¾ soluble in 90% alcohol or ether (*Guttiferæ*)	Cathartic = Siam Gamboge.—P.I. 30; E.P.I. iii. 476; Pg.I. i. 168.

Catechu Nigrum	5 to 15 gr.	*Acacia catechu.* I., E.C., N.A.C.	'Cutch.' Water-soluble 50 to 60%, alc. (90%) 80%, Pulv. Co. 1 in 2½, Tinct. 1 in 5, as B. P.	Astringent=Pale Catechu, Gambier P.I. 62; E.P.I. i. 42; Pg. I. i. 552, 557.
Trochisci	1 gr. in each			
Cissampelos	.....	*C. pareira.* I., E.C. (*Menispermaceæ*)	Dried root.....	Tonic, diuretic=Pareira root.—P.I. 7; E.P.I. ii. 328; Pg.I. i. 53.
Decoctum	½ to 2 oz.		Water 1 in 8	
Ext. Liquidum	½ to 2 dr.		Boiling water, percolate, concentrate, ¼th alcohol 90%, 1=1	
Coscinium	.....	*C. fenestratum.* I., E.C. (*Menispermaceæ*)	Dried stem	Tonic=Calumba.—P.I. 10; E.P.I. ii., 578.
Infusum	½ to 1 oz.		Boiling water, 30 minutes, in 20	
Liquor Concentratus	½ to 1 dr.		Cold water and alc. 90%, 1 in 2	
Tinctura	½ to 1 dr.		Alcohol 60%, macerate 1 in 10	
Cucurbitæ Semina Præparatæ, Melon Pumpkin Seeds	3 to 4 oz. bruised with water or milk	*C. maxima.* M.C. (*Cucurbitaceæ*)	Fresh ripe seeds deprived of testa and tegmen	Anthelmintic—P.I. 97; E.P.I. ii. 639.
Daturæ Folia	.....	*D. fastuosa v. alba* and *D. metel.* I., E.C., W.I.C.	Dried leaves.....	Anodyne=Belladonna and Stramonium.—E.P.I. iii. 34, 40.
Daturæ Semina.....	.....	*D. fastuosa var. alba.* I., E.C. (*Solanaceæ*).	Seeds	Diuretic and narcotic = Stramonium seeds.—P.I. 175, 460; E.P.I. iii. 34; Pg. I. ii. 585.
Embelia.....	1 to 4 dr.	*E. ribes* and *E. robusta,* I., E.C.	Dried fruit ..... (*Myrsinaceæ*)	Anthelmintic, like Kousso or Male Fern.—E.P.I. iii., 242; P.J. 1887, 171; 1888, 601, 305; Pg.I. ii. 349.
Extractum Glycyrrhizæ Spirituosum	½ to 1 dr.	I., E.C.	Extract of Liquorice 2, Alcohol 90% 1, Water *q.s.* to 4	Keeps better than B.P.
Gossypii Radicis Cortex	.....	*G. herbaceum.* I., E.C., N.A.C., W.I.C.	Dried root bark (*Malvaceæ*) ...	Emmenagogue=Ergot.—Pg.I. i. 224. p. 378.
Decoctum	½ to 2 oz.		Water, 1 in 5	
Ext. Liquidum	½ to 1 dr.		Alcohol 90%, Glycerin ¼th, 1=1	
Grindelia (*Compositæ*).	.....	*G. squarrosa* and *G. robusta.* A.C., N.A.C.	Dried leaves and flowering tops.	Sedative and antispasmodic. p. 379.
Ext. Liquidum	10 to 20 m.		Alc. 90% 1, Water *q.s.* to 3, with Sodium Bicarbonate 1=1	
Gummi Indicum.....	.....	*Anogeissus latifolia.* I., E.C.	Gummy exudation from wood	Demulcent 1=2 Gum Acacia.—E.P.I. i. 257; Pg.I. i. 553; ii. 12.

Preparation.	Dose.	where official.	menstruum and strength.	Properties and References.
Hirudo Australis		*H. quinque-striata.* A.C.	Five-striped or Australian leech	= European Leeches.
Hygrophila		*H. spinosa.* I., E.C.	Dried herb (*Acanthaceæ*)	Demulcent and diuretic.—P.I. 162; E.P.I. iii. 316; Pg.I. iii. 36.
Decoctum	½ to 2 oz.		Water, 1 in 10	
Ispaghula	50 to 150 gr.	*Plantago ovata.* I., E.C. (*Plantaginaceæ*)	Pinkish boat-shaped seeds	Much valued as demulcent = Linseed or barley.—P.I. 182; Pg.I. iii. 126.
Decoctum	½ to 2 oz.		Water, 1 in 73	
Kaladana	30 to 50 gr.	*Ipomœa hederacea.* I., E.C. (*Convolvulaceæ*)	Dried seeds	Purgative and Anthelmintic = Jalap.—P.I. 155, 459; P.I. iv. 486; Pg.I. ii. 530.
PHARBITIS NIL				
Pulvis Compositus	20 to 60 gr.		Kaladana 5, Acid Potassium Tartrate 9, Ginger 1	= Pulvis Jalapæ Compositus.
Tinctura	½ to 1 dr.		Alcohol 70%, percolate 1 in 5	
Kaladanæ Resina	2 to 8 gr.	*Ipomœa hederacea.* I., E.C.	Prepared as Resina Jalapæ. B.P.	Equivalent of Jalap Resin, insoluble in ether.
PHARBITISIN				
Kavæ Rhizoma		*Piper methysticum.* Au.C. (*Piperaceæ*)	Decorticated and dried rhizome	Stimulant diuretic. p. 740.
Ext. Liquidum	30 to 60 m.		Semi-alcoholic, 1 to 1	
Kino Eucalypti	5 to 20 gr.	*Eucalyptus var. sp.* Au.C.	Exudation from stem (*Myrtaceæ*)	Astringent = Kino. p. 332.
BOTANY BAY KINO				
Mylabris		*M. phalerata.* I., A.C., E.C. (*Coleoptera*)	Dried beetle	Vesicant = Cantharidis, contains Cantharidin 1 to 1·2 %.—P.I. 277, 467; E.P.I., iv. 209. p. 208.
Acetum Mylabridis			Mylabris *vice* Cantharides in B.P. 1898, 1 in 10	= Acetum Cantharidis.
Emplastrum Mylabridis			Mylabris *vice* Cantharides in B.P. in 1898, about 1 in 3	= Emplastrum Cantharidis.
Emplastrum Mylabridis Calefaciens			Mylabris *vice* Cantharides in B.P. 1898, about 1 in 25	= Emplastrum Calefaciens.
Liquor Epispasticus Mylabridis			Mylabris *vice* Cantharides in B.P. 1898, 1 in 2	= Liquor Epispasticus.
Unguentum Mylabridis			Mylabris *vice* Cantharides in B.P. 1898, 1 in 10	= Unguentum Cantharidis.

Myrobalanum (Black or) Chebulic Myrobalans	½ to 1 dr.	*Terminalia chebula*. I., E.C. (*Combretaceæ*)	Dried immature fruits	Purgative, astringent = Galls. P.I. 88; E.P.I. vi. pt. 4,33; Pg. I. ii. 1.
Unguentum			Benzoated Lard, 1 to 4	= Gall Ointment. p. 321.
Unguentum cum Opio			Above with Opium 7·5 %	= Gall and Opium Ointment.
Oleum Ajowan ..... Ptychotis Oil	½ to 3 m.	*Carum copticum* I., E.C. (*Umbelliferæ*).	Distilled from fruit	Aromatic, carminative, contains Thymol. —P.I. 99; Pg.I. ii. 116. p. 698.
Oleum Arachis ..... Earth-Nut, Ground-Nut or Pea-Nut Oil	.....	*A. hypogæa*. I., A.C., Au. C., E.C.	Expressed from seeds ..... (N.O. *Leguminosæ*.)	= Olive Oil —P.I. 74, 446; E.P.I. i. 286; Pg.I. i. 494. Mild, laxative and nutritive.
Oleum Caultheriæ ..... Oil of Wintergreen	3 to 10 m.	*G. procumbens* (*leaves*) *or Betula lenta* (*bark*). N.A.C.	Distilled Oil..... (N.O. *Ericaceæ or Betulaceæ*.)	Contains Methyl Salicylate, stimulant and diuretic. p. 56.
Oleum Graminis Citrati Indian Oil of Verbena or Lemon Grass	.....	*Andropogon citratus*. I., E.C., W.I.C.	Distilled Oil from entire herb... (N.O. *Graminaceæ*).	Carminative, with agreeable odour, contains Citral, Citronellal, &c.— P.I. 256; E.P.I. i. 243; Pg.I iii. 564.
Oleum Gynocardiæ ..... Chaulmoogra Oil	5 to 60 m.	*Taraktogenus kurzii*. I., E.C. (N.O *Bixaceæ*)	Expressed from seeds	Alterative and emetic; used for psoriasis eczema, and leprosy.—P.I., 26; E.P.I. iv. 193; Pg.I. i. 142. p. 510.
Unguentum			Paraffin 4, Soft Paraffin 5, Oil 1	
Oleum Sesami ..... Sesame Oil	.....	*S. indicum*. I., A.C., E.C., N.A.C.	Expressed from seeds..... (N.O. *Pedaliaceæ*).	Demulcent = Olive Oil.—P.I. 150; E.P.I. vi. pt. 2, 507; Pg.I. iii., 26. p. 184.
Oliveri Cortex Oliver or Black Sassafras Bark	.....	*Cinnamomum oliveri*. Au.C. (*Lauraceæ*)	Dried bark	Aromatic, yields an oil resembling, Sassafras Oil.—P.J. 11, 99, 165.
Tinctura	½ to 1 dr.		Alcohol 60 %, percolate 1 in 10	
Picrorhiza	10 to 50 gr.	*P. kurroa*. I., E.C. (*Scrophulariaceæ*)	Dried rhizome.....	Tonic, antiperiodic, aperient.—P.I. 160; E.P.I., vi. pt. 1, 229 Pg.J. iii. 10.
Ext. Liquidum	20 to 60 m.		Alcohol 60 %, percolate 1 in 1	
Tinctura	½ to 1 dr.		Alcohol 45 %, macerate 1 in 8	

Podophylli Indici Rhizoma INDIAN PODOPHYLLUM RHIZOME	.....	*P. emodi*. I., E.C. (*Berberidaceæ*)	Dried rhizome and roots	Cholagogue, cathartic.—P.I. 12; E.P.I. vi. pt. 1, 301; Pg.I. i. 69. p. 576.
Resina P. Indici	¼ to 1 gr.		Indian Rhizome by B.P. process	Rich in Podophyllotoxin.
Tinctura P. Indici	5 to 15 m.		Alcohol 90 %, 1 gr. Resin in 30 m.	
Sappan	.....	*Cæsalpinia sappan*. I., E.C.	Heart wood	Astringent = Logwood.—P.I. 79; E.P.I. ii. 11; Pg.I. i., 500.
Decoctum	½ to 2 oz.	(*Leguminosæ*.)	Water 1 in 20, with Cinnamon ·16	= Decoctum Hæmatoxyli.
Tinospora, (GULANCHA)	.....	*T. cordifolia*. I., E.C.	Stem collected in hot season .. (N.O. *Menispermaceæ*.)	Tonic, contains Berberine = Calumba.—P.J. 9, 435; E.P.I., vi. pt. 4, 64; Pg.I. i. 54.
Infusum	½ to 1 oz.		Cold water, 30 minutes 1 in 10	= Infusum Calumbæ.
Liquor Concentratus	½ to 1 dr.		Treated as Calumba 1 in 2	= Liquor Calumbæ Concentratus.
Tinctura	½ to 1 dr.		Alcohol 60 %, macerate 1 in 5	= Tinctura Calumbæ.
Tinctura Jalapæ Composita	½ to 1 dr.	I., E.C., N.A.C.	Jalap 8, Scammony 2, Turpeth 1, Alcohol 60 %, percol. to 100	Purgative. p. 454.
Toddalia	.....	*T. aculeata* I., E.C.	Dried root bark	Aromatic tonic = Cusparia.—P.I. 47, 442; E.P.I. vi. pt. 4, 67; Pg.I. i. 260.
Infusum	1 to 2 oz.		Boiling water, 15 minutes 1 in 10	= Infusum Cuspariæ.
Liquor Concentratus	½ to 1 dr.	(N.O. *Rutaceæ*.)	Alcohol 20 %, percolate 1 in 2	
Turpethum	5 to 20 gr.	*Ipomœa turpethum*. I., E.C., N.A.C.	Dried root and stem ..... (N.O. *Convolvulaceæ*.)	Purgative = Jalap.—P.I. 156; E.P.I. iv. 493; Pg.I. ii., 527.
TURPETH (or TURBITH ROOT)				
Tylophoræ Folia	¼ to 2 gr. Emetic: 15 to 30 gr.	*T. asthmatica* I., E.C.	Dried leaves..... (N.O. *Asclepiadaceæ*.)	Expectorant, emetic = Ipecacuanha.—P.I. 142, 458; Pg.I. ii., 437.
Urginea	.....	*U. indica* and *Scilla indica*, I., E.C.	Younger bulbs, soon after flowering. (N.O. *Liliaceæ*.)	Expectorant, stimulant, diuretic. = Squill.—P.I. 241; E.P.I. vi. pt. 4, 214; Pg.I. iii., 476.
INDIAN SQUILL				
Acetum	10 to 30 m.		Diluted Acetic Acid, macerate 1 in 8	= Acetum Scillæ.

Urginea *(continued)*				
Pil. Urginæ Comp.	4 to 8 gr.		Urginea, dried *vice* Squill in B.P. preparation	=Pilula Ipecacuanhæ Composita.
Oxymel **Urgineæ**.....	½ to 1 dr.		Urginea 5, Acetic Acid 5, Water 16, Honey *q.s.*	=Oxymel Scillæ.
Syrupus	½ to 1 dr.		Vinegar of Urginea 1, Sugar 38	=Syrupus Scillæ.
Tinctura	5 to15 m.		Alcohol 60 %, macerate 1 in 5	=Tinctura Scillæ.
Valerianæ Indicæ Rhizoma	.....	*V. wallichii.* I., E.C.	Dried rhizome and rootlets	Stimulant, antispasmodic=Valerian.—P.I.120 ; E.P.I.vi.pt.4,219 ; Pg.I.ii.238.
Tinctura Ammoniata	½ to 1 dr.		N.O. *Valerianaceæ*	
Viburnum, Black Haw (U.S.)	.....	*V. prunifolium.* I.,E.C.,N.A.C.	As Tr. Valerianæ Ammon.	=B.P. Tinctura Valerianæ Ammoniata.
Ext. Liquidum	1 to 2 dr.		Bark (*Caprifoliaceæ*)	Antispasmodic, diuretic, nervine tonic.
(Fluidextractum U.S)	(30 m.)	(*V. opulus* U.S. has similar properties. (*V. prunifol.* and Fluid extract 1 = 1 are in P. Austr.)	Alcohol 70%, 1 =1 ..... (1 = 1 *Hydro-alcoholic*)	For dysmenorrhœa and threatened abortion.

Further notes on Indian drugs.—P.J. ii./00,660,701 ; i./03,91.

ALTERNATIVE PREPARATIONS

Sanctioned by the Medical Council for use in India and the Colonies.

Adeps Induratus.—In hot climates Lard may be employed deprived of a portion of its oil by pressure.

Aquæ Olei Anethi, Anisi, Carui, Cinnamomi, Fœniculi, Menthæ Piperitæ, Menthæ Viridis, Pimentæ.—Each of these waters may be made by triturating the corresponding Oil with twice its weight of Calcium Phosphate and 500 times its volume of Distilled Water, and filtering the mixture. In hot climates these may replace the B.P. *Aquæ*. (U.S. employs approx. 8 × weight of talc instead of Calcium Phosphate.)

Emplastra.—In the Tropics more or less Hard Soap, Indurated Lard, or Yellow Bees-wax may be used in preparing the Plasters of the Pharmacopœia or Addendum where otherwise they would be too soft for convenient use; but the official proportion of the active ingredient must in all cases be maintained.

Extracta Liquida.—Any Liquid Extract liable to ferment in the Tropics, defined in the text of the Pharmacopœia or Addendum containing less than one-fourth of its weight of Alcohol (90 per cent.), may have this increased to one-fourth of the weight of the Extract.

Limonis Cortex Siccatus.—In the Tropics dried Lemon Peel may replace fresh Lemon Peel from *Citrus medica* var. *B-Limonum* (*Rutaceæ*). [Limonis Succus (fresh) is U.S.] **Oleum Limonis** (*Off.*)—From fresh Lemon Peel, Sp. Gr. 0·857 to 0·860. Rotation not less than + 59°. (U.S. requires 4% Aldehyde by weight calculated as Citral.)

Suppositoria.—More or less White Bees-wax may be used in place of an equivalent amount of Oil of Theobroma, when otherwise they would be too soft for convenient use in the Tropics.

Syrupus Rhœados.—The quantity of Alcohol may be increased or doubled, replacing an equivalent quantity of water.

Unguenta.—In the Tropics these may be made harder or softer according to the needs of the climate, but the official proportion of the active ingredient must in all cases be maintained.

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ABRUS.

Jequirity Seeds. — *Syn.* Prayer Beads; Jumble Beads; Gumchi (*Hindi*); Indian Liquorice.

The scarlet seeds of *Abrus precatorius* are poisonous when placed in wounds. The so-called **Abrin** is a mixture of active principles. — B.M.J. ii./89,184; ii./97,704; P.J. 1889,197.

Infusum Abri, R.O.H. — Jequirity seeds in powder 2, Water at 120° F., 25; decant when cold. Produces purulent ophthalmia for cure of granular lids.

Folia Abri are official in **Ph. Ned.**

Jequiritol *Dose.*—At commencement 1 drop of the Solution No. 1, increasing a drop at a time until the typical Jequiritol inflammation sets in.

An active principle in sterile 50% Glycerin solution, advocated to replace the infusion. **A Jequiritol Serum** is used for checking, if necessary, the inflammation produced by Jequiritol. The treatment has been employed in parenchymatous affections of the cornea, interstitial keratitis, eczema, and pannus.—L. i./01, 1836. In ophthalmic practice, results not very encouraging.—Ocular Therapeutics, M.P., Aug., 1905.

ACIDUM ACETICUM.

Acidum Aceticum Glaciale (*Off.*). Contains 99% Hydrogen Acetate. $CH_3.COOH = 59{\cdot}58$ (60·032 I. Wts.). Sp. Gr. 1·058. (**Ph. Ned.** 97·2%.)

A colourless liquid crystallising when sufficiently cooled and remaining crystalline until the temperature rises above 60° F. The Sp. Gr. is increased by the addition of 10% of water (distinction from an acid containing 46%, which has the same Sp. Gr.). **P. Austr.** and **P. Belg.** have Sp. Gr. 1·064, *i.e.* 96%.

Uses.—Is not given internally. It is applied to corns and warts. Has caustic action, but gives much pain.

Antidotes.—Chalk and water, alkalis, magnesia, washing soda, and then demulcents such as olive or almond oil, milk, or white of egg.

Acidum Aceticum (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

This contains 33% of Hydrogen Acetate, Sp. Gr. 1·044. **P. Austr.** designates 'Dilutum' the acid with Sp. Gr. 1·041 (30%); **Ph. Ned.** '**Acidum Aceticum**' 30%.

A product of the destructive distillation of wood and of the oxidation of ethylic alcohol.

Incompatibles.—Alkalis.

Use.—Externally for ringworm.

Acidum Aceticum Dilutum (*Off.*).

Contains 4·27% Hydrogen Acetate, Sp. Gr. 1·006. **Ph. Ned.** 6%.) *Dose.*—½ to 2 drachms (1·8 to (7.0 Cc.).

Uses.—May be given as an antidote to poisoning by alkalis, and largely diluted is applied as a lotion for inflamed joints, &c., and to bathe the skin as a refrigerant in cases of fever. Has been taken to reduce obesity, but is not to be recommended.

Oxymel (*Off.*).

Dose —1 to 2 drachms (3·5 to 7·0 Cc.).

Acetic Acid 1, Clarified Honey 8, Water 1, or *q.s.* to Sp. Gr. 1·320.

Acetum. *Syn.* VINEGAR. Contains about the same proportion of acetic acid as the official Dilute Acetic Acid. Varieties are those made from Malt and from White Wine. **P. Austr.** contains 6% Hydrogen Acetate.

Toilet Vinegar —EAU DE TOILETTE.

Neroli Oil 2 drachms, Rosemary Oil 2 drachms, Oil of Bitter Orange 4 drachms, Lemon Oil 4 drachms, Bergamot Oil 4 drachms, Thymol 30 grains, Glacial Acetic Acid 12 ounces, Water to 90 ounces. Filter through fuller's earth after three days' maceration.—Based on formula in Ph. Form.

Acetum Aromaticum, P.G.—Lavender, Peppermint, Rosemary, Juniper, Cinnamon Oils of each 1, Oil of Lemon 2, Oil of Cloves 2, Alcohol 441, Diluted Acetic Acid 650, Water 1900; all by weight. Macerate eight days and filter.

Acidum Amido-Aceticum.—*Syn.* GLYCOCOLL, GLYCIN. $CH_2.NH_2\,COOH = 74·52$ (75·08 I. Wts.).

White crystals with sweet taste, soluble in water 1 in 4½, slightly soluble in alcohol, insoluble in ether. Melting point 234° C.

Manufactured synthetically by heating monochloracetic acid 1 with ammonium carbonate 3, to about 65° C., and finally to 130° C. Dissolve the residue in water, boil with lead oxide to remove ammonia, filter and remove the lead from the filtrate with Sulphuretted Hydrogen and evaporate to crystallise.

Also made by boiling hippuric acid 1 in a vesse having a condenser tube 12 hours with sulphuric acid 4 (diluted 1 : 2). The benzoic acid formed is allowed to crystallise. Evaporate the filtrate. Shake with ether to further remove benzoic acid. Neutralise with barium carbonate, and evaporate afresh. Glycocoll crystallises out.

It is both acidic, by reason of its acid group, and basic, by reason of its amido grouping. It forms double salts with soluble metallic chlorides and nitrates.

Photographic use.—The name "Glycine" is also applied to the sodium salt of this body.

Hydrargyrum Glycocoll, Hydrargyri Amidoacetas. $(C_2H_4NO_2)_2Hg = 345{\cdot}84$ (348·144. I. Wts.)

Manufactured by dissolving freshly precipitated mercuric oxide in the acid. 1% injections are employed.

Betaine. $\begin{matrix} CH_2.\ N(CH_3)_3 \\ |\quad\quad | \\ CO-O \end{matrix} = 116{\cdot}25$ (117·128 I.Wts.),

Trimethyl Glycocoll. Occurs in *Beta vulgaris*. It is formed on oxidation of Choline (a non-poisonous syrupy fluid) $N{\equiv}(CH_3)_3 \begin{matrix} -CH_2.OH \\ \\ -OH \end{matrix} = 106{\cdot}34$ (107·144 (I.Wts.).

A decomposition product of Lecithin. Has been found in a number of vegetable and animal substances.

Dixon draws attention to the fact that Betaine Choline, Muscarine and Neurine have allied chemical constitution, toxicity increasing in the order written.

Betaine Hydrochloride.—*Syn.* Acidol.
$C_5H_{11}NO_2.HCl = 152{\cdot}44$ (153·586 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

White crystalline substance soluble in water. Liberates hydrochloric acid and is given with pepsin.

Hypodermic use is said to have effected a cure of tetanus.

ACIDUM BENZOICUM (*Off.*).

$C_6H_5.COOH = 121{\cdot}13$ (122·048 I. Wts.).

Syn. BENZOYL HYDRATE.

Dose.—5 to 15 grains (0·32 to 1 Gm.).

Manufactured either from Gum Benzoin or from Toluol, the former being the more expensive.

Soluble, if pure, 1 in 400 of water; 1 in 2½ of alcohol 90% ; 1 in 7 of chloroform; and very soluble in fats, oils, alkaline solutions (forming benzoates), and in glycerin about 1 in 30. Should not develop odour of benzaldehyde when warmed with its own weight of potassium permanganate and ten times its weight of dilute sulphuric acid (B.P. test for cinnamic acid). Solution in sulphuric acid when gently warmed should not turn darker than light brown, U.S. Commences to sublime at 100° C. (U.S.) and melts at 121·4° C. It prevents fats becoming rancid, as in Adeps Benzoatus (*Off.*) *q.v.*

Uses.—Benzoic acid is an antiseptic, a stimulating expectorant, antipyretic and diuretic. It is given in cases of chronic cystitis, urinary calculi and incontinence, also for rheumatism, further in large doses in phthisis, diphtheria, tonsillitis and scarlet fever.

Four grains of Benzoic Acid with 1 grain of Canada balsam, or 1 minim of glycerin, make a good pill.

A one in 20 solution in alcohol relieves urticaria, and, as an **Antiseptic Lotion** or **Gargle**, 1 dissolved in 500 of water is employed, or it may be suspended with glycerin if more than will dissolve.

Uræmic convulsions cease under free use of benzoates. They are stated to convert uric acid into the more soluble hippuric acid, and probably eliminate other Purin bodies (*q.v.*).—B.M.J. ii./04,890; i./06,126.

Detection of, in Foodstuffs. Extract with a mixture of ether and petroleum ether in equal parts; this evaporated will contain saccharin (taste), salicylic acid (by its colour with ferric chloride), and benzoic acid (recognised by odour, crystalline form, and conversion into anilin blue).—Y.B.P., 02,39.

Tablets, Compound, *v. Index.*

Benzoin (*Off.*)—There are two varieties known as Siam and Sumatra respectively, the former being by far the best. 20 per cent. total aromatic acid calculated as benzoic) of

hich not less than ½ shall be combined, suggested as standard.—B. & C.D. i./05,403.

ollutorium Acidi Benzoici (Miller's), R.D.H.

Dose.—30 drops to half a tumbler of water.

Benzoic Acid 3 grains, Krameria Tincture 1½ drachms, accharin 8 grains, Peppermint Oil 2 minims, Cinnamon Oil 2 minims, Alcohol 90% to 1 ounce.

Sphygmographic Varnish. Contains Benzoin, alsam of Tolu and Alcohol; is used for pulse tracings.

rochisci Acidi Benzoici (*Off.*).

Contain ½ grain in each (fruit basis); those of T.H. ave a red currant basis. Useful as a voice lozenge.

mmonii Benzoas (*Off.*). $C_6H_5.COONH_4 = 138{\cdot}07$ (139·112 I.Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In colourless laminar crystals; ***soluble*** 1 in 6 of old water, 1 in 30 of alcohol, and 1 in 8 of glycerin.

Magnesii Benzoas. $(C_6H_5.COO)_2Mg = 264{\cdot}44$ (266·44 I.Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

White crystalline powder. Antipyretic. ***Soluble*** in water 1 in 30, hardly soluble in alcohol 90%. Used as an antiarthritic for rheumatism and cathartic in cirrhosis of the liver.

Sodii Benzoas (*Off.*), U.S. $C_6H_5.COONa = 143{\cdot}01$ (144·09 I. Wts.).

Dose.—5 to 30 grains (0·32 to 2 Gm.).

In white granular crystals; ***soluble*** 1 in 2 of cold water (1 in 1·64.—P.J. i./02,552). Two varieties are in use commercially, one prepared from the acid obtained from Gum Benzoin and the other from the artificial acid —the cheaper of the two. **Tablets** 2 grains each.

Effervescent Sodium Benzoate.

Dose.—1 drachm. Contains 6 grains in 1 drachm.

Aqua Hæmostatica, P. Belg. Benzoic Acid 2, Benzoin Tincture 10 Alum 80, Water to 1,000.

Pyranum.—*Syn.* PYRENOL.

Dose.—8 to 30 grains (0·5 to 2 Gm.), thrice daily.

Said to be Benzoyl-thymol-sodium oxybenzoate.

A slightly aromatic, white hygroscopic crystalline

powder. ***Soluble*** about 1 in 1½ of water and 1 in 8 of alcohol 90%. Antipyretic and antineuralgic in sciatica and acute rheumatism. *Small doses, e.g.*, 8 to 12 grains, three times a day for a fortnight, are said to improve chronic rheumatism. *Large doses, e.g.*, 30 grains, increased the diaphoresis in pleurisy, and decreased the effusion.—B.M.J.E. i./03,79 ; i./05,19.

Acidum Hippuricum.

$CH_2 \begin{cases} NH.CO.C_6H_5 \\ COOH \end{cases}$ = 177·77 (179·112 I.Wts.).

Syn. Benzamido-acetic acid, Benzoylglycocoll.

This acid, occurring as white crystals, ***soluble*** in hot water, melting at 187° C., may be prepared from the urine of herbivora, also synthetically by treating glycocoll (Amido-acetic Acid, $CH_2NH_2.COOH$, *q.v.*) with Benzoyl chloride. Is employed mostly in the form of its salts.

Calcii Hippuras. $(C_9H_8NO_3)_2Ca, 3H_2O$ = 446·89 (450·356 I.Wts.).

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**).

In shining white crystals, ***soluble*** 1 in 27 of water.

Sodii Hippuras. $C_9H_8NaNO_3$ = 199·65 (201·154 I. Wts.). *Dose.*—5 to 30 grains (**0·32 to 2 Gm.**).

Is met with in commerce as a readily soluble white powder. Both it and the benzoate are recommended in gout, gravel, and calculus, as solvents for urates. A powerful depressent in arterio-sclerosis.—B.M.J.i./05,57.

Ammonii Hippuras $(C_9H_8NO_3)_2H.NH_4 + H_2O$ = 390·36 (393·304 I. Wts.).

Dose. - 5 to 10 grains (**0·32 to 0·65 Gm.**).

In white crystals ***soluble*** in water and alcohol. For the same ailments as the Sodium Salt. Said to lessen blood pressure.—C.D. ii./04,698 ; B.M.J. i./05,57.

Hippol, Methylene-hippuric Acid.

$C_6H_5CO-N(-CH_2-COO)-CH_2$ = 189·68 (191·112 I. Wts.).

Dose.—10 to 20 grains

Colourless crystals, hardly ***soluble*** in water. Has been advocated as a urinary antiseptic.

ACIDUM BORICUM (*Off.*).

Syn. Boracic Acid, Hydrogen Borate.

$H_3BO_3 = 61{\cdot}49$ (62·024 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In white, pearly, laminar crystals, unctuous to the touch, without odour, or in the form of an impalpable powder (that known as **Pulv. Acid. Boric. Subtilis** has been passed through a No. 170 sieve); has a bitterish, cooling, not acid taste. Obtained for medical purposes from borax by the action of sulphuric acid. ***Soluble*** 1 in about 25 of water, 1 in 3 of boiling water, 1 in 25 of 90% alcohol, 1 in 5 of glycerin at 32° F., 7 in 10 at 212° F., slightly soluble in volatile oils. Insoluble in ether.

1 Gm. boric acid dissolved in 50 Cc. water, after adding 50 Cc. glycerin requires not less than 16·2 Cc. normal sodium hydroxide to neutralise in presence of phenolphthalein. Corresponds to 99·8% pure H_3BO_3. U.S. ($H_3BO_3 + NaOH = NaBO_2 + 2H_2O$)

May be made into pills with glycerin of tragacanth, or with one-fifth of its weight of cream of tartar and water. Equal parts of boric acid and borax form a compound equally antiseptic and more soluble. **Glacialine** is a boric compound used in food preservation.

Incompatible with sodium salicylate in powder —a boro-salicylate apparently formed.—P.J. ii./05, 869.

Uses.—Boric acid is antiseptic and antiputrefactive. Both in powder and crystals it is soothing to the skin, mucous membrane, wounds, ulcers, or granulating sores. When mixed with starch it forms a useful "dusting powder" for infants, &c. A little sprinkled in the socks or stockings prevents the odour of perspiring feet. It wards off fleas, flies, cockroaches, &c. The lotion and lint are useful in ulcers of the legs and elsewhere. Boric acid and borax with glycerin form valuable applications for aphthæ and stomatitis.

Cachets of Boric Acid contain 10 grains (0·65 Gm.) each. These are employed to sterilise the urine before and after bladder operations, and have been given in typhoid.—B.M.J.E. i./93,7; also for cystitis.

50% of the acid administered is excreted in the urine within 12 hours, the other half remains in the body for 3 or 4 days, and hence may accumulate under repeated dosage.—B.M.J.E. i./06,16.

In otorrhœa alcoholic solution of boric acid better than powder.—B.M.J. i./06,250.

Poisonous effects of Boric Acid.—L. ii./01,1514; B.M.J.E., ii./01,91. 22 cases of toxic symptoms caused by.—L. ii./04,1817. Long continued internal use of borates may give rise to skin rash and albuminuria.—B.M.J.E. i./95,4; L. ii./98,1406; i./99,23. Daily doses of 1 to 2 Gm. caused formation of gas in the stomach and intestines, colic, pain in the epigastrium and diarrhœa.—L. i./03,749. (See also L. ii./04, 102, 259, 554, 1616, 1681, 1687; i./05, 535; ii./05, 38, 1429, 1637. B.M.J. ii./05, 676.)

Possible cause of increase of appendicitis. Acts as an irritant of the gastro-intestinal tract. May predispose to appendicitis from invasion of the intestinal wall by *B. coli communis*.—C. Williams, Clin. Jl., May 17, 1905

Detection of Boric Acid Preservatives in Milk.—This, the most frequently employed preservative, is detected by evaporating at least 10 Gm. of milk to dryness. Acidify the ash slightly with dilute hydrochloric acid (to **Litmus**). A strip of turmeric paper is then placed in the capsule, so as to be only partly wetted by the liquid Evaporate to dryness at 100° C.

If boron compounds are present, the part immersed in the liquid will turn brownish-red (formation of rosocyanin). On moistening with a drop of caustic soda, green and purple colours will be produced. On acidulating with hydrochloric acid, the red colour is restored, and is again changed to green and blue with excess of alkali.

The flame test is well known. Evaporate to dryness, treat the ash with a few drops of strong sulphuric acid, and then add a little methyl alcohol, and apply a light. The alcohol will burn with green at the edges of the flame (at the moment of ignition more particularly).—Allen, Vol. 4, *pp.* 175 *et seq.*

Estimation of boric acid with turmeric paper.—B. & C.D. i./06,214.

See also Formalin, *p.* 104.

Borax hinders the coagulation of casein in the stomach, and causes diarrhœa except in very small quantities. If more than 0·5 Gm. be taken daily there is a fall in the albuminoid metabolism; if 3 Gm. be taken daily a fall in weight can be observed. Boric acid had a similar effect.—B. & C.D., ii./03,98; L. ii./99, 1282.

Its use as a food preservative should be protested against until we have evidence that a child under one year of age can take 10 grains of boric acid daily for months with impunity.—L. ii./03,170.

Of 1,065 samples of food 132 contained salicylic acid,

3 formaldehyde, 195 contained some other preservative.—L.G.B. Report, C.D. ii./04,617.

Glycerinum Acidi Borici (*Off.*), **Glyceritum Boroglycerini, U.S.** (31 in 100.)

Heat Glycerin 9 (by weight) to not above 302° F., and add Boric Acid in fine powder 6. Continue heat with stirring until weight is reduced to 10, and add Glycerin (by weight) 10. Is the equivalent of **Boroglyceride,** which was a patented preparation. Is readily soluble in water and alcohol. It is recommended as an antiseptic and preservative of meat, fish, milk, and other food—1 in 40 of water is used. It has been employed as a surgical dressing for purulent ophthalmia and otorrhœa, and is given internally in aqueous solution, or in pills combined with althæa.

Pessus Boroglyceridi for vaginal use weigh 90 grains each, and contain 70 grains of Boroglyceride with gelatin 13 grains, and water *q.s.* *See also* **Ovules.**

Acidum Boro-Salicylicum.

A white powder soluble about 1 in 120 of water and about 1 in 8½ of alcohol 90%, has an action similar to Salicylic Acid. Is mostly employed as—

Sodium Boro-Salicylate.

Dose.—5 to 45 grains (0·32 to 3·0 Gm.).

Has been given in rheumatic affections.

Branalcane.

A rose-coloured compound of Boroglycerin, with a trace of Resorcin, is recommended as a pigment for diphtheria, throat, aural, nasal, and skin affections.

Lanolimentum Boroglycerini.

Boric Acid 2, Glycerin 10, Water 5. Heat to dissolve, and add Wool Fat 35, Olive Oil 13.

Gauze, Boric, impregnated 20%, is in 6 yard pieces and in small sterilised cartons.

Lint, Boric Acid 50%, coloured pink, 1 lb. rolls, should be kept in small sterilised cartons.

Liquor Antisepticus, U.S.

Average dose.—1 drachm (4 Cc.); Boric Acid 20, Benzoic Acid 1, Thymol 1, Eucalyptol 0·25, Oil of Peppermint 0·5, Oil of Gaultheria 0·25, Oil of Thyme 0·1, Alcohol 250 and Water to 1,000. Filtered through talc. Resembles **Listerine.**

Lotio Acidi Borici.

Boric Acid 1, Hot Water 20. Dissolve. Allow to cool—a portion of the crystals will separate. A most useful soothing antiseptic lotion.

Cartons of Boric Acid Crystals are supplied for producing respectively 1 pint of 2% and saturated solution—sufficient for a day's use—the patient being directed to prepare a sterile solution, *e.g.*, for an eye lotion, freshly made with boiling water.

Mistura Acidi Borici, L.L.

Boric Acid 10 grains, Dilute Nitro-hydrochloric Acid 10 minims, Compound Tincture of Gentian 1 drachm, Water to 1 ounce.

Pastillus Acidi Borici, T.H., *v.p.* 370

Useful in aphthous affections of the mouth and throat.

Pessus Acidi Borici.

Ten grains (0·65 Gm.) in each, with oil of theobroma. Convenient to replace douches after delivery.

Pulvis Acidi Borici Compositus, G.H.

Boric Acid 1, Zinc Oxide 3, Starch 6. For external application. U.C.H. for insufflation has Boric Acid 24, Potassium Bromide 24, Iodoform 2, Starch 99, Morphine Acetate 1, in fine powder.

'Solubes' Boric Acid, 15 grains each. For dissolving in 2 ounces of water as an eye wash, or more for vaginal injection or lotion to exposed surfaces.

'Solubes' Boro-Saline contain—

Sodium Biborate 5 grains, Sodium Chloride 5 grains.

'Solubes' Borax Compound contain—

Sodium Biborate 5, Sodium Chloride $2\frac{1}{2}$, Phenol $\frac{1}{2}$, Sodium Bicarbonate $2\frac{1}{2}$ grains.

'Solubes' Borax and Cocaine Co. contain—

Sodium Biborate 2 grains, Sodium Chloride 6 grains, Boric Acid 1 grain, Benzoic Acid $\frac{1}{4}$ grain, Menthol $\frac{1}{100}$ grain, Thymol $\frac{1}{100}$ grain, Cocaine Hydrochloride $\frac{1}{10}$ grain.

To be dissolved in 2 or 3 ounces of warm water, to be used as a nasal or throat spray.

Styles of Boric Acid for the lachrymal sac and duct are prepared two inches long.

uppositorium Acidi Borici.
Three grains (0·2 Gm.) in each. Useful in pruritus.

ablets, 5 grains (0·32 Gm.) **of Boric Acid.**

nguentum Acidi Borici (*Off.*).
Boric Acid, in very fine powder, sifted 1, Paraffin intment, white, 9. Mix. (1 to 6 in B.P. 1885.)

nguentum Acidi Borici (Martindale).

	No. 1.	No. 2.	No. 3.
Paraffin (135° or 140°) ...	5	5	5
Vaseline	5	10	15
Boric Acid, in fine powder ...	2	3	4

Melt the paraffin and vaseline together; sift the Boric Acid into the liquid, and stir constantly till cold. These three ointments contain the same quantity of Boric Acid, *i.e.*, 1 to 5 of basis; they are also made **half** and **quarter strength,** *i.e.*, 1 of the acid to 11 and 1 to 23 of basis respectively. The ointment of full strength is used where cavities exist; the others to superficial wounds which it is desired to heal rapidly.

Boric Acid ointment is applied to surface wounds, burns, eczema, chaps, and sores, as an antiseptic dressing and "healing ointment." On removal, it should leave the wound "clean"—it should adhere to the material on which it is spread, not so much to the sore. It is applied more like a plaster than an ointment. The No. 2 ointment, spread on lint or rag, is most suitable for general use, except in the summer, and in hot climates in which No. 1 should be ordered for smearing on to the skin. No. 3 being softer, is often preferable for this. It is very useful in pruritus ani et pudendi, and as a dressing for scalds and in minor surgery.

Unguentum Acidi Borici (U.S.) has Boric Acid 1, Paraffin (M.P. 51·6 to 57·2° C.) 1, White Petrolatum 8.

'Collapsubes' containing **Boric Acid Ointment** No. 3 are convenient for the nursery and domestic use.

'Collapsubes' **of Boric Cream** are also prepared for toilet use.

Unguentum Acidi Pheno-Borici.
Contains 2½% of Carbolic Acid added to either No. 1, No. 2, or No. 3 Boric Acid Ointment. In some broken skin surfaces this addition proves more healing.

Vaselinum Acidi Borici.—*Syn.* BORIC VASELINE.
Boric Acid in fine powder 1, White Vaseline 9.

'Collapsubes' of Boric Vaseline with catheter attachment for urethral use, or with suitable tubes for uterine or rectal treatment are supplied.

Wool, Boric, 50% absorbent, pink coloured, is supplied in 1 lb. rolls, and in convenient small sterile cartons.

Magnesii Boro-Citras.
Dose.—15 to 30 grains (**1 to 2 Gm.**).
In white powder or colourless scales, ***soluble*** in water; used as an urinary antiseptic internally for stone, gout, and rheumatism; and 1 with 2 of sugar is prescribed as **Boracite**, or compound powder of boro-citrate of magnesium. *Dose.*—60 grains *ter die*, to sterilise the urine 48 hours before operations.—L. i./03,836.

Sodii Biboras. BORAX (*Off.*). **Sodii Boras** (U.S.)
$Na_2B_4O_7.10H_2O$ = 379·12 (382·26 I. Wts.), (379·32 U.S. Wts.).
Dose.—**5** to 20 grains (**0·32 to 1·3 Gm.**).
Soluble 1 in 25 water, in glycerin 1 in 1, insoluble in alcohol (90%).
Incompatible with gums, mineral acids, also with cocaine hydrochloride, *q.v.*
Uses.—As gargle in diphtheria, for aphthæ, cancrum oris, and gangrenous stomatitis; pruritus ani and vulvæ, in bromidrosis and fœtid sweating of the feet.
Gouty parts treated with compresses of saturated borax solution covered with gutta percha tissue; relief in 12 hours.—P.J. i./05,299.
Empirically for epilepsy in 8 to 15 grain doses (licorice to cover the taste). Rashes may result with this treatment.—H.

Mel Boracis (*Off.*).
Borax 1, Glycerin ½, Clarified Honey 8.

Sodii Boro-Tartras. *Syn.* TARTARUS BORAXATUS. **Ph. Ned.** *Dose.*—30 grains (**2 Gm.**).
Sodium Biborate 2, Potassium Acid Tartrate 5, Water 15, evaporate until a little of the residue cooled is brittle. Powder and dry at 50° C.
Antiseptic and diuretic. May be tried for gout.

Perborates, derived from the hypothetical Perboric Acid, HBO_3 = 59·49 (60·008 I. Wts.).

Sodii Perboras. $NaBO_3, 4H_2O = 152{\cdot}89$ (154·114 I. Wts.). A white powder with permanent qualities prepared by the action of Boric Acid on Sodium Peroxide.

Soluble in water with decomposition.

Uses.—To produce oxygenated water, 1 kilo yields 104 Gm. or about 80 litres of active oxygen. This quantity will produce 8 to 10 litres of '10 volume' oxygenated water. The solution is not acid. It contains Hydrogen Peroxide and Borax.

In practice, (*a*) 25 Gm. of the salt dissolved in a litre of water at 35° C. is said to give a '5 volume' strength Hydrogen Peroxide solution; (*b*) 170 Gm. with 60 Gm. Citric Acid makes a litre of '10 volume' strength; (*c*) 210 Gm. with 105 Gm. of Citric Acid and 700 Cc. of water are stated to yield a '20 volume' solution.—B.M.J. i./05,42.

Some experiments were instituted to confirm these figures. It was found that 10 Cc. of a 1% solution of sodium perborate required in presence of sulphuric acid 11·4 Cc. of $\frac{N}{10}$ potassium permanganate solution indicating 87% pure sodium perborate.

(*a*) As to the first statement (25 Gm., &c.) it was found that this strength gave, experimentally, only 1·6 times its volume approximately, not 5 times as stated.

Theoretically, again, working on the data that O. 1 Gm. of the salt = 11·4 Cc. $\frac{N}{10}$ $KMnO_4$, then 1000 Cc. of the solution containing 25 Gm. of the salt would require 2850 Cc. $\frac{N}{10}$ $KMnO_4$ = (558×2·85) Cc. *Oxygen* = 1590·3 Cc. of oxygen evolved, or 1·5903 times its volume, not 5 times its volume as stated.

(*b*) *Re* the second statement (which is virtually correct):—

If O. 1 Gm. of the salt = 11·4 Cc. $\frac{N}{10}$ $KMnO_4$, then 170 Gm. will = 19380 Cc. $\frac{N}{10}$ $KMnO_4$ = (558×19·38) Cc. = 10814·04 Cc. of oxygen evolved, or 10·8 times its volume (approx.). The calculations are based on the temp. 0° C. If at 15° C, the volume would be slightly higher. Experimentally, 11 volumes were produced–($2KMnO_4 = 5O$ = (5×11·16) litres = 55·8 litres.) oxygen. 1 litre $\frac{N}{10}$ $KMnO_4$ = O. 558 litres of oxygen.

(*c*) The third statement we did not find substantiated

These solutions may be used to prepare antiseptic lotions, vaginal injections (about '5 volume' strength), *e.g.*, in leucorrhœa and metritis, and are useful in minor surgery. The dry salt may be used as a disinfectant, deodorant dusting powder.

Sodium Perborate and Manganese dioxide are utilised in making **oxygen baths.**—L. ii./05, 1338.

Zinc, Calcium and Strontium Perborates are also prepared.—B.M.J. i./05, 42.310.

Zymocide.

A liquid antiseptic and deodorizer—agreeable, non-irritating and non-poisonous. Diluted 1 to 5 or 10 of water, is used as a vaginal douche, also as a toothwash and for toilet purposes generally. Said to contain Extracts of Golden Seal and Calendula, Zinc Sulphocarbolate, Boric Acid, Witch Hazel, Sodium Thymolate, Menthol, and the Oils of Wintergreen and Eucalyptus.

ACIDUM CARBOLICUM.

Phenol (*Off.*). **U.S.** *Syn.* — PHENYL HYDRATE, $C_6H_5OH.=93{\cdot}34$ (*Off.* and U.S. Wts.) (94·048 I. Wts.)

Dose.—1 to 3 grains (0·065 to 0·2 Gm.)

In colourless crystals liable to become pink; neutral to test paper; obtained commercially from coal tar. Melts at not lower than 38·8° C. A pure Phenol is manufactured synthetically from benzene and from aniline oil.

Solubility.—100 parts are liquefied by 10 of water. Should form a clear liquid with 30 to 40 of water, and should be completely dissolved by 1,200 of water (*Off.*) Also soluble $3\frac{1}{2}$ in 1 glycerin*, 3 in 1 chloroform (nearly), 1 in 2 olive oil, 5 in 1 ether, 6 in 1 alcohol (90%), $2\frac{1}{4}$ in 1 benzol (nearly), and 1 in about 20 vaseline.

Uses of Phenol.—A powerful antiseptic, anti-putrefactive, and disinfectant, and applied locally, it has an anæsthetic action, similar but inferior to that of cocaine. It is given internally for dyspepsia and flatulence, *e.g.*, with rhubarb and nux vomica extract in pill. Has also been given for the plague, tetanus and erysipelas, in typhoid fever and puerperal fever, also in phthisis, bronchitis, pertussis, and for the gangrenous stage of pneumonia.

One in 80 or more of water as a vaginal injection in

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* Water 1 in 14, glycerin 1 in 0·33.—P.J. ii./03, 883.

corrhœa, uterine ulceration, and cancer; cleanses, heals, infects, and allays pain, and is suitable as a gargle.

Carbolic acid and its homologues and liquid preparations containing more than 3% of these are poisons, and placed in Schedule A, Part 2, of the Pharmacy Act, 1868.

Antidotes.— It causes more deaths from poisoning than any other drug. Wash out the stomach with water by a tube several times with great care. Apomorphine the most prompt and suitable emetic, and magnesium sodium sulphate, white of egg, and large doses of any innocuous oil should be given. Calcium saccharate is also recommended. Caffeine is also an antidote.—P.M.J. ii./01,713. Turpentine has been suggested. Amyl nitrite capsules, hot-water bottles.

As antidote, Camphorated Oil recommended; 100 grains administered, patient improved in an hour, and recovered in a short time.—C.D. ii./99,1054.

When carbolic acid is injected into the blood it uses up the sulphates forming sulpho-carbolic acid. When the sulphates are all used up acute poisoning sets in, controllable by injection of sulphates. Taken internally it is excreted mostly in the urine in the form phenyl-sulphuric acid.—Dixon.

A small proportion of sulphurous acid added to the melted acid or to a solution will prevent red coloration which results on keeping. To avoid accidental poisoning it could be coloured permanently with a distinctive dye.—P.J. i./05,787; C.D. i./05,859.

Pure alcohol said to effectually prevent escharotic action on the tissues.—L. i./00,481; P.J. ii./99,62.

Methods of testing carbolic disinfectants.— L. i./00, 158; P.J. ii./98,325; J.C.S. 1899,553-556.

Determination in gauzes, wools, &c.—P.J. ii./01,138.

A quantitative test for Phenol suggested for official requirements, *e.g.*, treatment with a known excess of bromine solution and titration of residual amount by decinormal thiosulphate.— B. & C.D. ii./98,651.

Absolute Phenol, in 1 lb. bottles and 28 lb. tins. In the form of **detached crystals** melting at not lower than 40° C. (104° F.), the official not lower than 39° C. (102° F.), these are hygroscopic and have a sweet taste, and are best adapted for surgical use.

Tablets ¼ and ½ grain for internal administration.

'**Solubes**,' 5 and 20 grains, on dissolving, produce antiseptic lotions.

A further variety is in crystalline masses, known as "Ice Crystals," melting at 39° to 40° C. (102° to 104° F.); this is also termed No. 1 Acid.

Acidum Carbolicum Liquefactum (*Off.*).

Dose.—1 to 3 minims (0·06 to 0·18 Cc.).

Ten parts of water by weight added to 100 of above—(crystallises in winter; is better with 15% at least.—P.J. ii./00,473.) (U.S. has 86·4% of acid. Sp. Gr. 1·064 to 1·069—at 25° C.) P. Austr. and Ph. Ned. have same strength as *Off.* This may be employed as a caustic.

Trouble frequently arises with liquefied phenol in the winter when there is a sudden drop in the temperature. Experiments which we conducted showed that the proportions 8-1, 9-1, 10-1 are all apt to separate.

Sealed Tubes of Liquefied Phenol containing one ounce to make a pint of 1 in 20 solution, are convenient for carrying in the surgical bag.

No. 2 Carbolic Acid, *Liquid.*

For general disinfection in infectious diseases. 1 in 40 may be sprinkled about rooms.

No. 4 Carbolic Acid, *Liquid,* in 16 oz. bottles, or in bulk. Is pale straw coloured.

This contains about 10% of Phenol and nearly 90% of Cresols, and is suitable for use as a household disinfectant for drains, sinks, water-closets, urinals, &c. A solution 1 in 40 of hot water may be used.

No. 5 Carbolic Acid, *Liquid,* in gallon jars or bulk. Dark coloured. For stable use, dust-bins, &c.

Carbolic Disinfectant Powder.

Contains 15% phenols mixed with a dry powdered earth.

Acidum Cresylicum. Cresolum Crudum P.G iv., U.S. *Syn.* CRESYL, PARACRESYLOL, CRESYL HYDRATE. $C_6H_4\begin{cases}CH_3\\OH\end{cases}$ = 107·25 (108·064 I. Wts.)

A yellowish liquid with tar-like odour.

A mixture of ortho-, meta-, and paracresols, forming the principal constituent in crude carbolic acids. Ortho-

esol (1:2) melts at 31° C. and boils at 188° C.
eta- (1:3) is a colourless liquid, boiling at 201° C.
ara- (1:4) melts at 36° C. and boils at 198° C.
he commercial article is much less soluble in water
an Phenol and is not so poisonous. It is recom-
ended for vaporization in whooping-cough.

Soluble 1 in 70 water, miscible with alcohol
0%, chloroform, ether, and glycerin in all
rengths. Is used in the preparation of Liquor Cresoli
aponatus, *q.v.*

Solutol is a specialty containing Cresol dissolved in
odium Cresolate. It is a brown, oily liquid disinfectant
f tarry odour, soluble in water.

Solveol.

Dose.—60 to 100 grains (**4 to 6·5 Gm.**) daily.

A solution of Cresols in Sodium Cresotinate: a 0·5%
olution is used as a local antiseptic in ozœna,
empyema and cystitis. Has been given internally in
crofulosis and tuberculosis.

Kresolum, Ortho Kresolum. P.Austr. *c.f.* p. 249.

In colourless acicular crystalline masses becoming
yellow or brown. By the addition of one-tenth of water
t forms **Kresolum liquefactum.**

Trikresol, a German specialty, is a purified mixture of the three cresols. It is a clear, colourless, oily liquid, soluble about 1 in 40 of water, and is said to have three times the germicidal power of Phenol. For surgical use, ½ to 1% solution recommended. As an eye-wash the strength may be 1 in 1,000 or 2,000.

Metakalin.

A soluble preparation of cresol with antiseptic properties for external use. 1% is disinfectant.

Metakalin Tablets.

15 grains. One in 4 ounces of water makes a 1% solution. Cartridges 2½ drachms for 35 ounces.

Carbolic Acid, Camphorated.

Phenol 12, Camphor 4, Water 1.

Melt or rub together till liquefied. Is not miscible with water or glycerin.

Is recommended as an antiseptic, germicide, and local anæsthetic, and is serviceable in toothache.

A useful wound dressing, and is injected to abort boils. Pr. xl. 128. Also used as a pigment to the cervix uteri.

Carbolic Acid Lotion. *Syn.* PHENOL LOTION.

Liquefied Phenol 1, Water 19 or more.

Solutio Phenoli, or Aqua Phenolata, should contain 2% of Phenol.—C.U.D.

Lotio Acidi Carbolici et Cocainæ.

Carbolic Acid ½ drachm, Cocaine Hydrochloride ½ drachm, Cherry Laurel Water 1 ounce, Rose Water 3 ounces. For pruritus.—B.M.J. ii./04,980.

Carbolic Oil.

Phenol 1, Olive Oil 19 (more or less, if ordered). Is applied to burns and scalds.

Lund's Oil, L.L. *Syn.* CATHETER OIL. For oiling catheters. Phenol 1, Castor Oil 4, Almond Oil 20.

Oleum Lubricans (St. G. H.) has Cocaine 25 grains, Oil of Eucalyptus 10 minims, Castor Oil ½ ounce, Olive Oil ½ ounce.

Catheter Paste.

Tragacanth 2·5, Glycerin 10, Aqueous Phenol Solution (3%) 90.—P.J. ii./99,529.

Surgical Lubricant for catheters, &c.

Starch 4, Glycerin 35, add Water 8½; heat to boiling, remove from flame and add Boric Acid in powder 2½, warm to dissolve and when nearly cold add Phenol 1. The Lubricant is supplied in 'Collapsubes.' Contains nothing to attack the metal of instruments, has the advantage over oily compounds of not attacking rubber goods, and can be removed by water.

Carbolised Iodine Solution (COLOURLESS).

Solution of Iodine (Lugol's) 2·5, Phenol 1, Boiling Water to 200.

Uses.—A pigment in diphtheria, or as a gargle or inhalation. Is useful as a nasal douche in ozœna, and for intra-uterine injection.

Collunarium Alkalinum Compositum, T.H.

Carbolic Acid 2 grains, Sodium Bicarbonate 5 grains, Borax 5 grains, Water to 1 ounce.

Collunarium Acidi Carbolici Compositum.

Syn. DOBELL'S COLLUNARIUM. C.L.T.E.

Glycerin of Carbolic Acid 10 minims, Sodium Biborate and Bicarbonate of each 6 grains, Water to 1 ounce.

argarisma Acidi Carbolici.
Aqueous Solution 1 in 100 or more. For foul breath
d sore throat.

auze, Carbolic, 5%, is in 6 yard pieces.

Catgut Ligatures are supplied raw and sulphoromic in hanks, Nos. 0000, the thinnest, up to No. 8. They e also supplied in bottles with carbolic acid solution 1 in , carbolised alcohol, turpentine, and various other antieptics. Mayo Robson sterilises in xylol, which boils at 137° to 40° C., and washes the gut so treated in 5% phenol in pirit before operating.—B.M.J.ii./02,974. Watson Cheyne reats first with liquid phenol 24 hours, then keeps in 1 in phenol solution, and rinses in 1 per 2000 perchloride before se.—L.i./03,349.

Gerrard uses the following process for sterilisation:—
1. Heating in turpentine oil to 250° F., and final immersion n sterilised liquid paraffin.
2. Heating in turpentine to 250° F., and then soaking or a week in 1% alcoholic solution of mercuric iodide, insing in 1 per 1,000 solution of mercuric iodide, and finally mmersing in sterilised liquid paraffin. The liquid paraffin is olourless, and remains clear and bright at all temperatures.

A further method is to heat the catgut gradually in cumol o 70° C., then in the same substance to 170° C. for two ours. Finally to rinse in petroleum benzine.

See also **Iodo-Acetone**, p. 101.

The method outlined for the new French Codex is:—Grease is first removed by continuous percolation with ether, dry six hours at 85° C., cool in desiccator. Place in hard glass tubes filled with absolute alcohol, and seal before the blowpipe, finally sterilise for 45 minutes at 120° C. When required for use the catgut is plunged into sterilised water and soaked for 15 minutes therein.

Silk Sutures are supplied on reels and in hanks, sizes 0, 1, 2, also sterilised in absolute Alcohol and Phenol Solution. Silcock sterilised by immersing in Olive Oil for 12 hours and then boiling in the same and keeping in Carbolised Spirit.

Silkworm Gut, extra fine, fine, medium, and stout, in 10 and 14 inch lengths.

Glycerinum Acidi Carbolici (*Off.*). *Syn.* **Glyceritum Phenolis, U.S.**

Phenol 1, Glycerin *q.s.* to 5.

Useful as a throat pigment and applied to wounds and to ringworm. In acute middle ear catarrh with good result.—B.M.J. ii./04,1210.

Ravogli's Liniment. Carbolic Acid 1, Glycerin 2, Alcohol 90% 16, Rose Water to 32. In skin affections.

Guttæ Acidi Carbolici, St. M.'s H. Carbolic Acid 10 grains, Glycerin to 1 ounce.

Pigmentum Antisepticum.

For Hay Fever. Glycerin of Carbolic Acid 1 ounce, Quinine Hydrochloride 30 grains, forms a useful pigment for the nasal passages.

Iodized Phenol. Pigmentum Iodi Carbolicum, G.H.

Iodine 1, Liquefied Phenol 4. Digest till dissolved. For intra-uterine medication on cotton wool.

Useful also for ringworm of the scalp.

Injectio Acidi Carbolici Hypodermica.

Dose.—5 to 20 minims. (0·3 to 1·2 Cc.).

Two per cent. has been used for tetanus, erysipelas and phlegmonous inflammations of the skin.—Whitla.

Liquor Sodii Carbolatis.

Phenol 8, Caustic Soda $3\frac{1}{2}$, Distilled Water 100.

To be diluted with 10 to 20 times its volume of water.

These proportions of Phenol and Sodium Hydroxide are nearly the quantities required by theory, and they will be found to yield a sharp and pleasant mouth wash.

Phenol is freely soluble in caustic alkaline solutions. A French specialty, known as *Phenol Sodique*, is much used as an antiseptic solution by dentists. Its composition is similar to the above.

Antiseptic Dental 'Solubes.'

For preparing an extemporaneous mouth-wash which is antiseptic and agreeably perfumed.

Contain Boric Acid, Sodium Phenate, Thymol, Sodium Benzoate, and Aromatic Essential Oils. Employed in the prevention of dental caries and in suppurating conditions. One to be used frequently in a wine-glassful of water (preferably warm).

Pastillus Acidi Carbolici.

Contains $\frac{1}{2}$ grain (0·032 Gm.) phenol. Antiseptic and stimulant. For any ulcers in the mouth or throat, and for purifying the breath.

Perles and Capsules of Carbolic Acid.

Globules of carbolic oil, containing one grain (0·065 Gm.) and two grains (0·132 Gm.) of Phenol in each.

Dose.—1 or 2.

Pilula Acidi Carbolici.

Phenol 2, Powdered Liquorice 1, Powdered Althæa 1. In grains for one pill, in grammes for 15 pills.

helling Salts, Carbolised.

Phenol 24, Ammonium Carbonate 16, Strong Solu-n of Ammonia 44, Oil of Lavender 1½, Camphor 3, he Sawdust (sifted), *q.s.* For coryza, hay fever, luenza, &c.

nti-Catarrhal Salts.

Phenol 1, Eucalyptus Oil 1, Pumilio Pine Oil ½ rong Iodine Solution ½, Camphor 1, Ammoniated cohol 2, Pine Sawdust 2 or *q.s.*

esina Carbolica, R.D.H.

Resin 4, Carbolic Acid 4, Chloroform 3. Dissolve nd filter.

This is used as an obtundent and a temporary anti-ptic filling. **Method.**—Syringe out all food from the vity and remove as much decay as possible. Apply on wool pledget. Will often relieve toothache in a short ime.

uppositorium Acidi Carbolici (*Off.*).

Phenol 1, White Beeswax 2, Oil of Theobroma, nelted, 12 or *q.s.*

Trochisci Acidi Carbolici (*Off.*).

One grain (0·065 Gm.) with Tolu basis. For sores n mouth and throat.

Unguentum Acidi Carbolici (*Off.*).

Phenol 1, Glycerin 3. Dissolve and add Paraffin Ointment, white, 21. U.S. has 3% in white petrolatum. Most useful for ulcers and efficacious in various parasitic skin diseases.

Suggested alternative formula. — Phenol 1, Hard Paraffin 6, Soft Paraffin 18. Does not crystallise out.—L. i./05,513; but becomes harder than the official.

Suggested that almond and olive oil be substituted for glycerin.—C.D. i./06,110.

Unguentum Acidi Carbolici cum Cocaina.

Carbolic Acid 20 minims, Cocaine Hydrochloride 10 grains, Vaseline 1 ounce.

Unguentum Acidi Carbolici cum Hydrargyri Perchlorido.

Liquefied Carbolic Acid ½ drachm, Mercuric Chloride 2 grains, Olive Oil 2 drachms, Zinc Ointment to 1 ounce.

Both the above are for pruritus.—B.M.J.ii./04,980.

Unguentum Acidi Carbolici cum Menthol.
Carbolic Acid 2, Menthol 1, Cold Cream 100.
For eczema with much itching.—H.

Vapor Acidi Carbolici.
20 drops of Liquefied Phenol in a pint of water at 140° F. Inhaled or as a spray, in pertussis and for throat ulcers. It lessens and disinfects the over-abundant expectoration in bronchitis and gangrenous lung.

Wool, Carbolic, 5% absorbent, 1 lb. rolls.

Preservative Solution for Anatomical Subjects.
Phenol 1, Glycerin 4, Methylated Spirit 5. Used for injection into the aorta.

Pusol. — A special preparation said to contain carbolic acid and camphor. Used as a dusting powder, and as an ointment (1 in 8) for various skin affections.

References to Carbolic Acid.

Typhoid and diarrhœa, successful treatment of, by carbolic acid in pills, keratin-coated. Is prophylactic to scarlet fever and stamps out puerperal septicæmia.—B.M.J. ii./92,1424; i./93,347,500,637,1311; i./94, 909; L.ii./93,1305.

The use of Carbolic lotion, 1 in 100, keeps off flies and other insects, and relieves mosquito stings.

A 10% solution with cocaine added, relieves non-suppurative middle ear diseases.—B.M J. ii./04,1211.

A 2% solution in spirit has been used as a pigment in diphtheria.

Hæmorrhoids injected with Phenol and Glycerin, equal parts; successful.—P.J. 1895,959.

Compresses soaked with 5% solution of Phenol may cause coma.—L.i./95,1362; M.C. Dec./97, 208. Even 1 in 40 has caused carboluria and death when applied to penis after circumcision.—W. W. W. Also after use as lotion on leg.—L. i./03,1099.

Many cases of tetanus recovered after subcutaneous injection of Phenol.—L.ii./95,169; i./97,168; B.M.J.E. i./96,72; Pr. lxii.309; B.M.J. i./01,1270. A 3% solution used.—P.J. i./05,299.

Plague patients in Hong Kong received 144 grs.

r diem for days with evidently satisfactory results.—
.A. 1904,75; L. ii./03,753.

Small-pox pustules have been touched with liquid
id with good results.—L. ii./03,1153, 1781.

As a pigment to limit spread of erysipelas.—
.M.J. i./01,1142.

Volumetric process of estimation improved.—P.Jii./04,453.

L.C.C. Report on Disinfectants:—Phenol Solution 1 in 20
nd Mercuric Chloride 1 in 1,000 are true germicides for B.
berculosis.—L. i./02,758.

Comparative strength with Sanitas and Formalin.—
.M.J. ii./04,16.

Acidum Sulphocarbolicum.

Syn. PHENOL-SULPHONIC or SOZOLIC ACID.

$C_6H_5.H.SO_4 = 172{\cdot}80$ (174·108 I. Wts.)

Prepared by the action of strong sulphuric acid on phenol. The *para-* acid is produced in the warm (the *ortho-* when working in the cold), crystallises with difficulty, dissolves readily in water, alcohol, and glycerin, and is a strong antiseptic and disinfectant.

In gingivitis and pyorrhœa a 3% **solution** useful, reduces swelling, arrests flow of pus, and the gums return to their natural shape.

A 33% **solution** has been sold as **Aseptol.**

Cupri Sulphocarbolas. — *Syn.* CUPRI-ASEPTOL.

$(C_6H_5\ SO_4)_2\ Cu + 6H_2O = 514{\cdot}00$ (517·896 I. Wts.)

In light green small crystals, soluble in water, useful as a hæmostatic or antiseptic lotion, or astringent injection, ¼ to 1½%.

Sodii Sulphocarbolas (*Off.*) U.S. SODIUM PHENOL-PARA-SULPHONATE. $C_6H_4\ OH.SO_2\ ONa, 2H_2O =$ 230·44 (232·182 I. Wts.) (230·45 U.S. Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In white rhombic crystals, somewhat like magnesium sulphate. Soluble 1 in 5 of water. Is useful for flatulence, cholera, the dyspepsia of phthisis, and in tonsillitis 5 to 10 grains every 2 hours have been given.

Zinci Sulphocarbolas (*Off.*). ZINC PHENOL-PARA-SULPHONATE; ZINCI PHENOLSULPHONAS, U.S. $(C_6H_4OH.SO_3)_2Zn,H_2O = 426{\cdot}39$ (429·616 I. Wts.).

The commercial salt contains $8H_2O$ (U.S.), making the molecular weight 551·55 (557·728 I. Wts.) (551·56 U.S. Wts.).

Crystals in rectangular colourless plates. Soluble 1 in 2 of water (1 in 2·7. P.J. i./02,552). Useful in gonorrhœa and leucorrhœa; 2 or 3 grains in an ounce of water for injection.

'**Solubes**,' 2 and 10 grains (0·13 and 0·65 Gm.), produce 2 and 10 ounces or more respectively of lotions for external use or injection.

Phenolphthalein (*Off*).—*Syn.* PURGEN; DIHYDROXYPHTHALOPHENON.

$$C_6H_4<\begin{matrix}C(C_6H_4.OH)_2\\CO\end{matrix}\!\!>O = 315{\cdot}72\ (318{\cdot}112\ \text{I.Wts.}).$$

Dose.—½ to 8 grains (0·032 to 0·52 Gm.).

A crystalline substance produced by inter-action of Phenol and Phthalic Anhydride. Soluble 1 in 10 of alcohol 90, but only 1 in 600 of water.

Is useful where a prompt purgative is required, as in jaundice. In ordinary patients a dose of from ¾ to 3 grains is sufficient, but patients confined to bed require from 3 to 10 grains. Does not irritate the kidneys.

A useful hydragogue purgative, but may cause piles to bleed.—B.M.J. i./05.302.

Tablets, ½, 2, and 4 gr. are made.

"Purgen" is supplied, "Infants'" containing ¾ gr., "Adults' Purgen" 1½ gr., and "Strong Purgen" 7½ gr. —B.M.J. ii./02,353,1224; P.J. ii./02,563.

It is also employed as an indicator in volumetric analysis as it turns pink with alkalis. See page 860. It is not suitab'e for titration of ammonia.

Tribromophenol.—*Syn.* BROMOL. $C_6H_2Br_3.OH$ = 328·39 (330·904 I. Wts.) (OH : Br : Br : Br = 1 : 2 : 4 : 6).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) in pill.

Obtained by the action of bromine on phenol in solution, and recrystallized from alcohol. In long silky needles, nearly insoluble in water, soluble 1 in 3 of alcohol 90%, 1 in 1 of ether, 1 in 3 of chloroform and glycerin; also soluble in fats and oils; has an odour resembling bromine, and sweet astringent taste. Melts at 185° F. (85° C.) Is a caustic and disinfectant. May be used alone, or in ointment (1 in 10), oily solution (1 in 30), or for diphtheria in glycerin solution (1 in 25). Is not dissolved by gastric juice, and is used as an intestinal disinfectant and in typhoid, also in minute doses for cholera infantum.—L. ii./91,831.

Tribromophenol-Bismuth. — *Syn.* XEROFORM. $(C_6H_2Br_3O)_2.Bi.OH + Bi_2O_3(?) = 1341{\cdot}20$ (1350·3 I. Wts.).

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**).

A greenish-yellow neutral insoluble powder, with faint odour and taste, containing bismuth oxide and tribromophenol in nearly equal proportions. A powerful bactericide recommended specially for cholera.—L. ii./99,1459; B.M.J.E. ii./99,88; P.J. i./00,65.

Gauze, Xeroform, 10%, 6 yard pieces.

Gallobromol, Dibromo-gallic Acid. $C_6Br_2(OH)_3.CO.OH + H_2O = 343{\cdot}35$ (345·968 I.Wts.).

Dose.—5 to 15 grains (**0·32 to 1 Gm.**).

In whitish minute crystals, soluble 1 in 10 of water, also in alcohol. Used internally in place of alkaline bromides as a nervous sedative, and as an antiseptic astringent injection in gonorrhœa, chordee, and cystitis, and as a lotion in eczema.

Phenosalyl.

A German specialty, said to consist of a solution of carbolic, salicylic, and lactic acids, with menthol and eucalyptol. Dissolves 1 in 25 of water, and is recommended, 1%, as antiseptic lotion or ointment, mixed with an equal quantity of glycerin as a caustic; and internally, in dose of 1 or 2 minims, for flatulence.

Trichlorphenol. — *Syn.* TRICHLORPHENIC ACID. $C_6H_2Cl_3.OH = 195{\cdot}91$ (197·374 I. Wts.).

A derivative of phenol, in white acicular crystals, with a disagreeable tarry odour, pungent taste, entirely volatilised by heat; soluble 1 in 1 in alcohol, 2 in 1 of ether, 1 in 9 of glycerin, fixed and volatile oils; practically insoluble in water. The salts of calcium and magnesium have been used medically; the solid substance is but little irritating to the tissues, and the solutions not at all.

Para-Monochlorphenol. $C_6H_4Cl.OH = 127{\cdot}53$ (128·49 I. Wts.).

Crystalline needles, ***soluble*** in alcohol and ether, but not in water to any extent. Melting at 37° C. and boiling at 217° C. The *ortho-* body boils at 176° C. and the *meta-* melts at 28·5° C. and boils at 212° C.

A powerful antiseptic used in treatment of lupus, phthisis, keratitis, iritis, and is also employed in dental

work as an analgesic. A paste for subsequent filling is made with powdered Cobalt and Tropacocaine Hydrochloride of each equal parts, with sufficient Para-Monochlorphenol and Zinc Oxide to produce a soft paste. The unpleasant taste may be moderated by Menthol.

This substance in 5 to 10% solution in glycerin has also been used for laryngeal catarrh.—B.M.J.E. i./02, 43. Inhalations $\frac{1}{4}$ to $\frac{1}{2}$%.

ACIDA CHLORACETICA.

Acidum Monochloraceticum. $CH_2Cl.COOH$ = 93·77 (94·474 I. Wts.)

A chlorine compound of acetic acid, in deliquescent white crystals, melting at 63° C., or more generally liquefied. It blisters the skin, and is used as a caustic for warts and corns. ***Soluble*** with ease in water, alcohol, and ether. More frequently used is:

Acidum Dichloraceticum. $CHCl_2.COOH$ = 127·96 (128·916 I. Wts.)

A colourless caustic liquid boiling at 189 – 191° C.

Used as a caustic to venereal sores.—P.J. ii./00,586.

Acidum Trichloraceticum, P.G. iv., U.S., Ph. Ned., $CCl_3.COOH$ = 162·15 (163·358 I. Wts.), (162·12 U.S. Wts.)

Prepared by chlorination of acetic acid, or by the action of fuming nitric acid on chloral hydrate (U.S.).

In deliquescent crystals, melting at 55° C. (lower if moist), and boiling at 195° C., very soluble in alcohol and ether. This is a quick escharotic for venereal and other warts; it is also useful in throat affections. The application of a crystal produces a dry adhering eschar which is quickly thrown off. There is said to be no secondary inflammation. For use as an astringent, 1 in 1 or 2 of glycerin with a little iodine and potassium iodide.

Recommended in chronic gonorrhœa, solution 1 in 4, applied on a tampon by means of an endoscope; less painful than silver nitrate. Also, diluted, for epistaxis.

Is a delicate test for albumin, *v.* Albumin Tests.

As an astringent lotion 1% is employed.

A powerful stimulant for granulating surfaces and chancroid ulcers.—P.J. ii./01,365.

ACIDUM CHROMICUM.

Chromic Anhydride (*Off.*). $CrO_3 = 99{\cdot}38$ (100·1 I. Wts.)

In deliquescent, crimson, acicular or columnar crystals. It is odourless, and a powerful oxidising agent, decomposing alcohol, glycerin, &c., with evolution of heat.

When used as a caustic the healthy surrounding tissue should be protected with ointment.

Soluble 1 in 0·59 water at 61·5° F.—P.J.i./02,552.

Liquor Acidi Chromici (*Off.*).—1 to 3 of water.

A watery solution—1 in 4, or stronger—is applied with a pointed glass rod to warts on genitals, to condylomata and lupus; and 1 in 40 to ulcerated gums, and syphilitic affections of tongue, pharynx, and larynx.

For sweating feet; after washing, paint with a 5 to 10% solution.—Pr. xliii.299; B.M.J.ii./89,1256.

Successful use of chromic acid in cystic goître, ranula, and other cysts; a concentrated solution applied to the bounds of the cavity; also in epithelioma of tongue.

A dilute lotion 1 in 2,000 or more is used in leucorrhœa and ozœna.

In hæmorrhagic endometritis, curettage followed by application of Chromic Acid Solution 1 in 8.—B.M.J. i./06,921.

ACIDUM CINNAMICUM.

Cinnamylic Acid—*Syn.* **Phenylacrylic Acid.**

$C_6H_5CH{=}CH.CO.OH = 146{\cdot}95$ (148·064 I. Wts).

Dose.—*Per os*, $\frac{1}{20}$ to $\frac{1}{4}$ grain (0·0032 to 0·016 Gm.).

Intravenously (in oily emulsion) $\frac{1}{50}$ to $\frac{1}{20}$ grain (0·0013 to 0·0032 Gm.).

In transparent micaceous crystals, very slightly soluble in water, soluble in alcohol and ether.

Owing to its power of stimulating leucocytosis—the main source of 'complement,' *v.p.* 757—Cinnamic Acid probably supplies indirectly (as yeast does directly) the necessary quantity of complement for combating infectious diseases.—Bosanquet.

Sodii Cinnamas.—*Syn.* HETOL.

$C_6H_5CH{=}CH.CO.ONa = 168{\cdot}83$ (170·106 I. Wts.).

Dose.—3 to 5 grains (0·2 to 0·32 Gm.) *per os*, or hypodermically.

Soluble 1 in 11 water, in glycerin 1 in 10 (*secundum artem*).

Solution 1 in 20 of distilled water or normal saline solution, sterilised for intravenous injection, has been found to exercise a beneficial effect in the treatment of phthisis. —Pr, lxx, 574; L. ii./04, 1136; B.M.J.E. ii./04,35.

Action of Sodium Cinnamate intravenously in rabbits. —B.M.J.E. i./05,24.

The cinnamates have vasodilatory action (Oliver), and in this direction are harmless even on prolonged use. —L. ii./05,206.

Value of oil and preparations of cinnamon as internal antiseptics injected for phthisis, and given internally for cystitis and influenza.—B.M.J. i./95,584,697,753.

Thirty minims of a 10% solution is recommended as an injection twice a week for cancer.—B.M.J. i./05,927.

Glass Tubes of Hetol solution contain 1 Cc. each of 1 and 5% solution respectively for injection.

Glycerinum Sodii Cinnamatis.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

A 10 per cent. solution in sterilised glycerin is employed for hypodermic injection in tuberculosis and cancer. In the preparation of this solution care must be taken not to heat above 180° C. (about 356° F.) to prevent the formation of acrolein, which would be irritating; this effectually sterilises the solution.

Causes a general leucocytosis after intravenous injection.—Jour. Path. and Bact.

Inoperable scirrhus satisfactorily treated by Sodium Cinnamate with Radium and 'X' Rays in addition.—B.M.J. ii./05,1496.

A development in the cinnamate treatment consists in the employment of the serum obtained from tuberculous horses after repeated injection of the cinnamate.

Furthermore, the Sodium Salt of Phenylpropiolic Acid—$C_6H_5.C : C.COOH = 144·95 (146·048$ I. Wts.), —under the name 'Thermiol,' has been used in the treatment of laryngeal and pulmonary tuberculosis by inhalation of 0·5 to 3% solutions. By reason of the treble linking in the side chain it is found to be far more active than the parent Benzoic Acid.—P.J. ii./04,967.

Hypodermic Sterules of Glycerole of Sodium Cinnamate contain 30 minims each (2 Cc.).

Acidum Hydrocinnamicum. — *Syn.* BETA-PHENYL-PROPIONIC ACID. $C_6H_5.CH_2\ CH_2—CO.OH$ = 148·95 (150·08 I. Wts.)

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) Made by reduction of cinnamic acid with sodium amalgam.

In white feathery crystals, melting at 48-49° C. Insoluble in water, but soluble 1 in 1 of alcohol 90%; given for phthisis.

Heto-Kresol. CINNAMYL-METAKRESOL.

$C_6H_4.OH.O.OC.CH=CH.C_6H_5$ = 238·29 (240·096 I.W.)

A white crystalline powder, insoluble in water or glycerin, but slightly soluble in alcohol.

Is used in cases of tuberculous wounds and broken surfaces.

Liquor Cinnamylicus.—HOFF., *v. p.* 143.

Strontii Cinnamas $(C_6H_5.CH=CH.CO.O)_2Sr$ = 381·712 (I. Wts.)

Dose.—2 to 5 grains (0.13 to 0.32 Gm.)

A white powder, soluble about 1 in 120 of water and about 1 in 50 of a mixture of glycerin and water equal parts, and about 1 in 100 of alcohol 90%.

This has been used similarly to the Sodium Salt.

Cinnaldehydum. — U.S. $(C_6H_5CH:CH.COH)$ = 131·07 (B.P. and U.S. Wts.; 132·064 I. Wts.)

Dose.—1 minim (0·05 Cc.).

Syn. Cinnamal, P. Austr.

The aldehyde from cinnamon oil. A colourless liquid with cinnamon odour. Sp. Gr. 1·054 to 1·056. ***Soluble*** in alcohol in all proportions.—**P. Austr.** Was tried for hypodermic injection, but was found too painful.

Acidum Coumaricum.—*Syn.* *o*-**Hydroxycinnamic Acid.** $C.CH:CH.COOH$

= 162·83 (164·064 I.Wts.)

Manufactured by heating coumarin 10 parts with a solution of 3·5 parts of sodium in 65 parts of absolute alcohol. The solution is then diluted with

water and evaporated to small bulk. The acid is liberated by means of dilute hydrochloric acid. It is removed and dissolved in sodium carbonate. The sodium salt in solution is then freed from coumarin by shaking with ether (coumarin remaining unattacked can thus be recovered and used up again). The acid is then thrown out again with a little dilute hydrochloric acid, and is purified by recrystallisation from alcohol.

The ortho-coumaric acid forms brownish crystals, melting at 200° C., the meta- melts at 191° C. and the para- at 206° C.

The isomeric coumaric acids (ortho- meta- and para-) form corresponding sodium salts. **Sodium ortho-coumarate** has been principally employed medicinally.

It was thought that the sodium salt of this hydroxycinnamic acid would prove more powerful than the cinnamic salt which had already yielded good results in the treatment of malignant diseases (see Glycerinum Sodii Cinnamatis). This opinion was deduced by comparing the action of salicylic acid (hydroxybenzoic acid) with that of benzoic acid (introduction of the **Hydroxyl** grouping). Furthermore it may be noted that ortho-coumaric acid stands in the same relationship to salicylic acid as cinnamic does to benzoic acid—introduction of the **Acrylic** grouping. Ortho-coumaric acid is ***soluble*** very slightly in chloroform, in alcohol 1 in 12, in ether 1 in 36, hardly soluble in water.

Uses.—For general treatment and as a precursor to and after operation (for three months if necessary) in malignant diseases. The sodium salt is not so painful on injection as the cinnamate. The drug has a considerable action in the prevention of the proliferation of cells in cancer. It produces a marked leucocytosis.

The coumarates and compounds have action of vaso-dilators, and they may be taken for prolonged periods without harm.—Oliver, L. ii./05, 206.

Sodii Ortho-Coumaras. $C_9H_7O_3Na = 184{\cdot}71$ (186·106 I. Wts.).

This salt is best used in the form of

Injectio Sodii Ortho-Coumaratis 22% aqueous solution.

Dose.—25 minims (1.5 Cc.) administered once or twice a week.—B.M.J. i./05,1143.

This solution is a clear yellow liquid perfectly stable. If desired, stronger solutions may be prepared, as the salt is very soluble in water.

Is of value in tubercular diseases; it is a matter of doubt whether sodium cinnamate or coumarate is the more active. Brilliant results have been obtained in cases of glandular and early cases of pulmonary tuberculosis. In cancer, greater difficulty is experienced, owing to the variation of the disease; but with the exception of Formalin, no drug exerts more definite action.—Drage.

Hypodermic Sterules of Sodium Ortho-Coumarate Solution contain 25 minims of the above and are convenient in use.

The **Sodium Meta-Coumarate** — $C_6H_4.OH.CH:CH.COONa$ (1:3) — was found to be even more active than the ortho- compound, but its preparation is somewhat more complicated.

The salt is readily soluble; 20% solutions have been used hypodermically.

The **Para-** Salt—$C_6H_4.OH.CH:CH.COONa$. (1:4)—is not so active as the others. An 8% solution has been employed, as the sodium salt is less soluble than that of the foregoing isomerides.—P.J. i./05,816; B.M.J. i./05 927; ii./05,1317; L. ii./05,392.

The carbolic acid coefficients of germicidal value in respect of *B. typhosus* as estimated by the Walker-Rideal method for the coumaric acids in 40% alcohol are:—

For the ortho- 6·5; for the meta- 4·5; for the para- 4·0. —J. T. Ainslie Walker.

Tylmarin, *Martindale*. — **Acidum Acetyl-*o*-Coumaricum.**

$= 204·53$ (206·08 I. Wts.).

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

Colourless crystals melting at 150°C.

This substance constitutes a stage further in the Cinnamic and Coumaric treatment. In view of the fact that acetyl-salicylic acid (*q. v.*) was found to have many advantages over the parent chemical salicylic acid, the ortho-coumaric acid has been acetylated.

Soluble only slightly in water (easily in presence of alkali, but dissociation occurs), in alcohol 90% 1 in 19, in ether 1 in 50, in chloroform 1 in 16.

Uses.—More essentially for cancerous diseases, but also for tuberculosis and as an intestinal antiseptic.

Its use has proved a very valuable adjuvant to Sodium-Orthocoumarate in pulmonary and glandular tuberculosis. (The surgeon's knife is no longer required; in early cases of glandular tuberculosis and in pulmonary tuberculosis, any case which can be cured by the open-air treatment can be successfully treated with this drug accompanied by injections of the 22% Solution of Sodium-Orthocoumarate, and the Glycerin Solution of Sodium Cinnamate.)—(Drage.) Administered *per os* the substance probably undergoes hydrolysis into *o*-coumaric acid and acetic acid. At the time of going to press physiological experiments were instituted with cancerous mice as the standard animals with a view to definitely establishing the action of these bodies.

The carbolic acid coefficient of tylmarin in 40% alcohol in respect of *B. typhosus* has been determined by the Walker-Rideal method and has been found to be 4·5 —J. T. Ainslie Walker.

Tylmarin Cachets contain 5 grains.

Tylmarin Tablets contain 5 grains.

Sodium Meta-Oxy-Cyano-Cinnamate.

$C_{10}H_8NO_3Na = 211·56$ (213·154 I Wts.).

Syn. ZIMPHÉNE. *Dose.*—1½ grains 4 times daily.

Yellowish crystalline substance. Soluble in water and alcohol 1.

Increases flow of digestive fluids, therefore of importance for use in dyspepsia. Favours assimilation.—F.N. 1906, 309.

ACIDUM CITRICUM.

$C_3H_4OH.(COOH)_3, H_2O = 208·5$ (210·08 I. Wts.)

Dose.—5 to 20 grains (0·3 to 1·3 Gm.).

Colourless crystals or white crystalline powder, 99·38% pure B.P.; 99·5% U.S.

Lemon juice contains as much as 7 to 9% (30 to 4 grains per ounce).

Soluble.—10 in 6 of water, 1 in 2 of glycerin, 1 in 1½ of alcohol (90%), 1 in 8 of ether, Sp. Gr. 0·735 but much less soluble in 0·720 ether.

For quantities of alkalis to be prescribed with this cid in the form of effervescing mixtures, *v.p.* 889.

Uses.—Relieves thirst and to prevent scurvy. Forms efreshing effervescing drink in relief of fever. Lemon uice is better than citric acid for scurvy. A useful nethod of preserving it is to boil the juice, place in stone bottles whilst hot, and cover with a little oil before plugging with a cork. Stored upright will keep in this manner for months.

In rheumatism and given internally in jaundice.—H.

Incompatible with potassium tartrate and alkaline carbonates.

Manufacture of this acid and tartaric acid in London.—P.J.i/04,835.

Potio Riveri, Ph. Ned. An effervescing draught.

ACIDUM FORMICUM.

Syn. **Aminic Acid.** P.G. IV., Helv. III. $H.COOH = 45{\cdot}67$ (46·016 I. Wts.).

Dose.—2 to 10 minims (0·12 to 0·6 Cc.) freely diluted, *e.g.* with mineral water.

A colourless liquid Sp. Gr. 1·060 – 1·063 (24 to 25% H.COOH). Miscible with water in all proportions. In concentrated form has a caustic action.

Uses.—It is alleged that this acid (acting in a manner similar to cantharides) gives tone to the muscles and restrains muscular tremor, as in cases of paralysis agitans and in chorea. It increases muscular energy and abolishes the sense of fatigue. It is more frequently employed as one of the salts.

Sodii Formas, $H.COONa + H_2O = 85{\cdot}43$ (86·074 I. Wts.).

Dose.—$\frac{1}{6}$ to 3 grains (0·01 to 0·2 Gm.) in solution, increased if desired.

A white crystalline powder soluble in water. A strong reducing agent and powerful antiseptic.

Elixir Sodii Formatis.

Sodium Formate 4, Essence of Vanilla, *q.s.*, Simple Syrup, *q.s.*, to 100.

Dose—2 drachms (7 Cc.).

Uses.—In cases of heart and kidney diseases it lessens the loss of albumin by the urine, although it has

diuretic powers. Does not disagree with the stomach. Said not to be toxic. General tonic action as the acid.

Has been employed in phthisis and in pneumonia. Improves appetite, mental, and physical activity.

Ocular fatigue due to accommodative asthenopia, or to a fault in convergence treated with sodium formate instillation 1 in 50 to 1 in 30. Found to augment the tone of the motor muscles of the eye-ball, and to retard the visual fatigue.—B.M.J.E. ii./05,95.

Potassii Formas, H.COOK = 83·5 (84·158 I.Wts.).

Dose and use similar to the Sodium Salt.

Lithii Formas, H.COO Li, H_2O = 69·52 (70·054 I.Wts.) White crystalline powder freely soluble in water.

Dose.—$\frac{1}{6}$ to 2 grains (0·01 to 0·13 Gm.).

Use.—Similar to the above and has been given in gout; as much as $1\frac{1}{2}$ Gm. of this salt has been given daily, and of the Sodium and Potassium Salts 3 Gm.—L. i./05,892.

Strychninæ Formas, $C_{21}H_{22}N_2O_2$. HCOOH $2H_2O$ = 413·18 (416·304 I. Wts.).

Dose.—$\frac{1}{50}$ grain (0·0013 Gm.).

White crystalline powder soluble in water 1 in 2, in alcohol 90% 1 in 6.

A nerve stimulant and muscular tonic.—P.J. i./06,24.

Formic Acid and Ant-Elixir in gout, paralysis and tremors.—L. ii./05,980.

In tremor, a case of a woman 65 and a man 72 who had suffered 10 and 18 years respectively, treated by 4 Gm. doses of Normal (?) Solution of Formic Acid with rapid and surprising results. Hyoscyamine not nearly so good. May also prove of value in chorea.—L. ii./05, 907.

Cuprous Formate, $Cu_2(HCOO)_2$. = 215·58 (217·216 I. Wts.).

Made by acting on cuprous oxide with ammonium formate under a layer of petrol.—B. & C.D. i/06,161.

ACIDUM HYDROBROMICUM.

Acidum Hydrobromicum Concentratum.

HBr = 80·35 (80·968 I. Wts.)

A Hydrobromic Acid of Sp. Gr. 1·308, which is colourless or straw-coloured, is met with in commerce. One volume diluted with three of distilled water

roduces an acid of official strength and specific gravity. hould be kept from sunlight.

Acidum Hydrobromicum. P.G. iv. has Sp. Gr. ·208, and contains 25% of hydrogen bromide. That of Ph. Ned. is quadrinormal with Sp. Gr. 1·224.

Acidum Hydrobromicum Dilutum (*Off.*); U.S.

Dose.—15 to 60 minims (0·9 to 3·5 Cc.); 60 minims = 10 grains of potassium bromide approximately. Contains 10% of hydrogen bromide. Sp. Gr. 1·077. May be prepared by the action of Phosphoric Acid on Potassium Bromide. Sulphuric Acid is unsuitable owing to secondary decomposition.

It is a colourless, very sour liquid, without odour.

Uses.—To allay nervous excitability and exhaustion, as a solvent for quinine and preventing quinism, and as an alternative for potassium bromide and is less liable to cause acne; 8 minims will dissolve 5 grains of quinine sulphate in water. It is also given with morphine to allay after effects of this drug.

Obviates the sense of fulness of the head felt when taking iron for anæmia; also to remove the ill effects of excess of tea or alcohol; and to calm excited heart.

It is useful for tinnitus aurium and tickling hacking cough at night, in doses of 10 minims or more, and in headache, with flushing in the face and ringing in the ears. It relieves toothache.

In vertigo generally successful.—Trans. Otol. Soc. of U.K., Vol. vi.; M.A. 1906,197.

In epilepsy, the dose should be full, up to half an ounce well diluted; even to 3 ounces daily.

For **sea sickness**, a specialty (*Bon Voyage*) of some service contains, *inter alia*, this acid and sodium bromide.

Dose.—Half an ounce in a wineglassful of water every 3 hours for 24 hours before embarking, and for the first 2 days of the voyage, afterwards in half-doses if required.

ACIDUM HYDROCHLORICUM (*Off.*).

HCl = 36·19 (36·458 I. Wts.) Sp. Gr. 1·160 contains 31·79% HCl. Is free from arsenic (B.P. and U.S.). Ph. Ned. 25%. Sp. Gr. 1·126.

Use.—Escharotic.

Incompatible with alkalis, alkaline carbonate silver and lead salts.

Antidotes.—Alkalis, sal volatile, saccharated lim calcium carbonate, alkaline bicarbonates, carron o white of egg, morphine, lime water, magnesia, mil soap and water. Give beef tea enema and stimulants.

Acidum Hydrochloricum Dilutum (*Off.*).

Dose.—5 to 20 minims (0·3 to 2 Cc.).

Is prepared by diluting 6 of the strong acid with wat to 20. Sp. Gr. 1·052. Contains 10·58% HCl by weig (U.S. is 10%). **Ph. Ned.** is quadrinormal.

Use.—Tonic biliary stimulant. In dyspepsia, whe insufficiency of acid, given before meals with gentia Gargle 1 in 50 to 1 in 100 for sore throat. When w diluted forms useful refrigerant drink and lotion.

Hydrochloric acid, free from arsenic, may be made b warming with pure fine copper gauze, and then distil ing.—Y.B.P. 1902, 36.

ACIDUM HYDROCYANICUM.

Acidum Hydrocyanicum (Scheele's strengt B.P.C.)

Dose.—1 to 4 minims (0·06 to 0·25 Cc.).

Colourless liquid with powerful odour. Contai 4% HCN. = 26·85 (27·048 I. Wts.).

Antidotes.—Emetics immediately, stomach tub brandy, or ether, fresh air, inhaling ammonia, artifici respiration. $\frac{1}{50}$ grain atropine hypodermically. Hydr gen peroxide and Chlorine Water have been given.

Sodium Hyposulphite 2 to 4 drachms injected hyp dermically forms non-poisonous sulphocyanide.—Dixo

Acidum Hydrocyanicum Dilutum (*Off.*), U. **Ph. Ned. P. Belg.**

Dose.—2 to 6 minims (0·12 to 0·35 Cc.).

Contains 2% HCN, Sp. Gr. 0·997. To preser keep in inverted stoppered bottles in the dark.

Uses.—In dyspepsia with pain, combined wi bismuth or sodium bicarbonate. To allay vomiting a cough. It is very useful as a sedative in an effervesci mixture, and as a 2% dilution as lotion to soot the itching of pruritus ani or pruritus vulvæ, or gener prurigo. Must not be used to broken skin surface.

Incompatible with soluble silver or iron salts

Volumetric Estimation. – Titrate about 1 Gm accurately weighed, kept slightly alkaline with Sodium Hydroxide throughout the test), with $\frac{N}{10}$ Silver Nitrate Solution, until a permanent Silver Cyanide precipitate is formed. The soluble double Salt, AgCN.NaCN, is intermediate. $AgNO_3 = 2HCN$ or 1 Cc $\frac{N}{10}$ $AgNO_3 = 0{\cdot}00537$ Gm. HCN. B.P. directs that 1 Gm. should require 3·7 Cc. of the Volumetric Solution, *i.e.* = 0·019869 Gm. HCN or 1·9869%.

Borax Solution in excess is added to Hydrocyanic Acid before titration with Silver Nitrate. Suitable for Cherry Laurel Water.—P.J. ii./05,910.

Delicate Test for Hydrocyanic Acid.—A few drops of phenolphthalin solution made alkaline with Sodium Hydroxide added to liquid to be tested. If red colour be produced on adding Cupric Sulphate Solution 1 in 2,000 (due to oxidation into phenolphthalein) Hydrocyanic Acid is proved to be present.

Phenolphthalin is made by reducing phenolphthalein with Zinc in alkaline solution.—P.J. i./05,721.

ACIDUM HYDROFLUORICUM PURUM.

HF = 20·008 (I. Wts.).

Fluoric Acid of commerce is redistilled for medicinal use. Manufactured by the action of Sulphuric Acid on Fluor Spa (CaF_2) in lead or platinum vessels. It contains about 30% of the gas, emits suffocating fumes, and requires to be kept in gutta-percha or leaden bottles. Diluted 5 times has been used for inhalation in phthisis, and also in malaria, particularly where quinine is objected to or is useless. May produce some sneezing and running at the eyes.

Acidum Hydrofluoricum Dilutum, B.P.C.

Dose.—5 to 20 minims (0·3 to 1·2 Cc.).

Contains 0·2% of hydrofluoric acid. Even thus diluted should not be kept in glass bottles for use.

Goître—of 20 cases treated in doses of 15 to 70 minims—17 recoveries and 3 failures.

Ammonii Fluoridum NH_4F = 37·072 (I. Wts.).

This salt has been suggested to diminish enlarged spleen and in goître in doses of 5 to 20 minims of solution, 4 grains in an ounce, after meals. For phthisis, inhalation from a 2 per 1,000 solution has been recommended. It is soluble 5 in 6 of water and about 1 in 250 of alcohol 90%.

One of the authors (W.H.M.) took 4 grains experimentally. Almost immediately dizziness set in, then headache and feeling of nausea, which passed off in about an hour. This may be considered therefore more than a maximum dose.

Incompatible with Nitric Acid, Quinine Salts, Spirit of Nitrous Ether and soluble Calcium Salts, but compatible with Tinctura Ferri Perchloridi.

Antitussin.

An ointment for whooping-cough. Contains 5% Di-fluoro-diphenyl.—P.J. ii./00,775. **Fluor-rheumin** consists of Fluor-phentol 1, Di-fluor-di-phenyl 1, Soft Paraffin 10, Anhydrous Wool Fat 85. For rheumatism and influenza.—P.J. ii./99,11.

Ferri Fluoridum. Ferric with Ferrous Fluoride.

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

A purplish grey insoluble powder, possessing hæmatinic properties, is valuable for enlarged spleen.

Quininæ Fluoridum. $C_{20}H_{21}N_2O_2$, HF = 344·28 (I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.)

In relieving enlarged spleen and in rickets.

Sodii Fluoridum. NaF = 42·05 (I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

Use.—Antiseptic in phthisis.

Fluoroform. CHF_3 = 70·008 (I.Wts.)

A 2 to 2½% solution (the solubility is 2·8%) under the designation **Aqua Fluoroformi** is employed for pertussis, phthisis, and as a muscular tonic.—B.M.J.E. ii./03,56.

Odourless, tasteless, and non-poisonous, and does not impair digestion.

Dose.—For young children 1 teaspoonful every hour, for older children ½ ounce.

Is said to have cured a serious case of lupus by long continued administration of 100 Gm. daily.

ACIDUM IODICUM.

HIO_3 = 174·54 (175·978 I. Wts.). *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.).

White crystalline powder very soluble in water. Iodic acid is a remarkable deodorant and preservative even in a 1 in 2,500 solution. It is employed in ozœna, for deodorising offensive urine, as an irrigant in

empyema (strength 1 in 500) and for leg ulcers, as a mouth wash, *e.g.*, in inoperable epithelioma, and as a throat swabbing in diphtheria. It was found very useful in a case of extensive burning (1 in 500 solution). Internally a drachm of a 1 in 100 solution, well diluted, has been given in gastro-intestinal sepsis, as in typhoid fever. The calcium salt is principally employed.

Calcii Iodas. $Ca(IO_3)_2, 6H_2O = 494{\cdot}07$ (498·136 I. Wts.). *Syn.* CALCINOL.

Dose—3 to 4 grains (0·18 to 0·24 Gm.), three times daily in solution.

Tasteless, odourless powder, soluble in 380 parts of water at 11·5° C. Contains 51% of iodine and 16% of available oxygen. Acts equally well in an acid or alkaline medium as a deodorant and anti-putrefactive.

Uses.—Is particularly useful as a dusting powder. A **Lotion** is employed in septic and suppurating wounds, and a **Gauze** (3% strength) may be used for the same purpose. Healing ensues with the production of a dry scab. A warm saturated solution is used as a **vaginal douche** or bladder irrigant; is eminently efficient as a mouth wash or gargle. There is a field of usefulness for it in **dentistry**, *e.g.*, in pyorrhœa alveolaris, &c. An **ointment** 10 grains to the ounce, has been found to be a veritable specific in various forms of eczema. A solution is further useful as an irrigant in otorrhœa.

Hypodermic injections of from ½ to 2 drachms of an emulsion of 3 drachms of the Iodate in 1 ounce of glycerin have been used in tuberculous joints.

It is antiseptic; action is probably due to liberation of iodine and oxygen when coming in contact with putrescent organic matter.—P.J. i/01,27.

Valuable as a substitute for iodoform, and as a gastro-intestinal antiseptic agent. May prove of value in fœtid breath, and in the form of an insufflation 1 in 10 of bismuth carbonate may be beneficial in otorrhœa.—L. ii./00,1867.

Mercuric Iodate, $Hg(IO_3)_2 = 545{\cdot}88$ (549·94 I. Wts.).

Dose.—$\frac{1}{6}$ to $\frac{1}{3}$ grain (0·01 to 0·02 Gm.).

A white powder containing 46% of available Iodine. As a general antiseptic it is probably more efficient than

either Mercuric Perchloride or Biniodide. ***Soluble*** with the addition of Sodium Chloride to the extent of 2% in water. Potassium Iodide also assists solubility. It has the scientific advantage of attacking disease organisms with both its component ions, and it contains only half as much Mercury as the Perchloride. Furthermore, it has been found to corrode instruments less than the salts mentioned. In a pronounced sycosis of hairy parts of the face an ointment containing 20 grains to the ounce produced an effectual cure.

Bismuth Subiodate, a fine white powder containing about 48% available Iodine.

Insoluble in water. It does not irritate the part to which it is applied. It has been used in lupus in powder form and as ointment (20 grains to the ounce), and in scrofulous glands as a dusting powder.

Sodium Iodate, $NaIO_3 = 196{\cdot}42$ (198·02 I. Wts.) in 5% solution (about saturated) is injected for acute and chronic articular rheumatism.—P.J. i./01,666.

Has been employed in cerebro-spinal meningitis.—M. 1906.

Zinc Iodate.—$Zn(IO_3)_2 = 411{\cdot}99$ (415·34 I. Wts.). White powder containing 61% of available iodine. ***Soluble*** about 1 in 50. It is stronger than the calcium iodate and is used for similar purposes.—L. i./05,143.

ACIDUM LACTICUM. (*Off.*).

U.S., P.G., P. Austr., Ph. Ned., P. Belg.

$CH_3.CHOH.COOH = 89{\cdot}37$ (90·048 I. Wts.).

Dose.—5 to 20 minims (**0·3 to 1·2 Cc.**), well diluted. U.S. *average dose* 30 minims.

A colourless, odourless, syrupy, sour liquid, obtained by the fermentation of milk sugar by the action of *Bacillus acidi lactici*. It has Sp.Gr. 1·21 and contains 75% of hydrogen lactate.

Solubility.—Is miscible with water, alcohol, and ether; it coagulates milk and albumin.

Uses. - It is employed topically to destroy morbid growths, in diphtheria, &c., and internally for infantile and tropical diarrhœa, for diabetes, dyspepsia, and as a stomachic tonic in combination with iron and lime.

Chemistry of lactic acid.—*P.J.* ii./05,912. Test for in vomit, &c., *vide* 'Examination of Stomach Contents.'

Butyric Acid ($C_4H_7(OO)H$ = 87·4 (88·064 1. Wts.) —(with the characteristic evolution of hydrogen) may also be produced if the fermentation proceed too long, or if the lactic acid as it is produced be not neutralised by the presence of calcium carbonate or zinc oxide.

Acidum Lacticum Dilutum (*B.P.* 1885). Sp. Gr. 1·040. Lactic Acid 8 ounces, Distilled Water *q.s.* to 1 pint. *Dose.*—½ to 2 drachms (1·8 to 7 Cc.).

In gonorrhœa a few drops of the pure acid has been injected just beneath the membrane of the cervix.

Indolent ulcers in laryngeal tuberculosis curetted and treated with lactic acid but applied to an unbroken surface of no avail and only causes distress.—*B.M.J.* ii./05, 1191 to 1196 (Opinions differ).

For infantile diarrhœa with green stools.—*Pr.* lxx. 144.

Injectio Acidi Lactici, C.L.T.E.

Lactic Acid 4 to 6 drachms, water to 1 ounce. Is directed to be introduced by means of the submucous laryngeal syringe into the tissues of the larynx.

Nebula Acidi Lactici, T.H.

Lactic Acid 1, Distilled Water 15. Of great use in diphtheria; appears to have the effect of dissolving the membranous exudation.

Pigmentum Acidi Lactici, G.H.

Lactic Acid 1, Water 1. Alopecia treated by a 30% lotion.—*B.M.J.E.* ii./01,92.

Spiritus Acidi Lactici.

Lactic Acid 3, Castor 2, Lavender Water 4, Alcohol 90% to 24. Suitable for treatment of alopecia areata. To be rubbed in gently at first, later with some amount of friction.

Calcii Lactas $\left[C_2H_4\begin{Bmatrix}OH\\(OO)\end{Bmatrix}\right]_2Ca+5H_2O$ = 305·85 (308·26 1. Wts.)

Dose.—1 to 15 grains (0·065 to 1 Gm.).

An opaque, white, crystalline powder antiseptic and stomachic, and given for rickets; unless freshly prepared not readily soluble in water.

Ferri Lactas, *Ferrous Lactate. P.G. P. Belg.*

$(C_2H_4OH(OO))_2Fe+3H_2O$ = 285·98 (288·028 1. Wts.)

Dose.—1 to 5 grains (0·065 to 0·32 Gm.)

In greenish-white crystals, soluble 1 in 60 of water, when taken internally is easily assimilated by the system.

Potassii Lactas.

$C_2H_4.OH.COOK = 127{\cdot}20$ (128·19 I. Wts.).

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

Yellowish syrup miscible with water. Has been employed to increase alkalinity of the blood in gouty conditions of the gums.

Calcii Lactophosphas.

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Crystalline powder. Is often only a mixture of equal parts of calcium lactate and (dibasic) calcium phosphate. Soluble in water. Stomachic tonic.

Plumbi Lactas $(C_2H_4OH.COO)_2Pb = 382{\cdot}09$ (384·98 I. Wts.).

A white crystalline powder, soluble in water.

Sodii Lactas. $C_2H_4.OH.COONa = 111{\cdot}25$ (112·09 I. Wts.). *Dose.*—5 to 10 grains (0·32 to 0·65 Gm.).

Usually in form of yellowish syrupy liquid miscible with water. Large doses are said to be hypnotic.

Syrupus Calcii Lactophosphatis (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Add gradually Precipitated Calcium Carbonate 25 to Lactic Acid 60, diluted with Distilled Water 240. When dissolved add Concentrated Phosphoric Acid 46, and triturate until the precipitate formed is redissolved. Dilute with a little Distilled Water, add Orange-flower Water 25, filter, and add Refined Sugar 700; dissolve without heat, strain, and add Distilled Water *q.s.* to 1,000. (U.S. has Phosphoric Acid 36, Orange Flower Water 50, Sugar 725.)

An alternative method is to dissolve the Calcium Carbonate in the mixed acids diluted with 250 of water —P.J. i./03,127.

Dusart's Syrup. *Dose.*—2 drachms to ½ ounce.

Calcium Carbonate 9, Lactic Acid 75% 22, Phosphoric Acid 10% 88, water *q.s.* Dissolve the Calcium Carbonate in the Lactic Acid diluted to 108 with water with the aid of heat. Cool, and add the Phosphoric Acid, and make up to 370. Dissolve in this Sugar 625 and add Spirit of Limes 7. Mix and adjust to 1,000. *All parts by weight.*—Y.B.P.02,232.

Syrupus Calcii et Ferri Lactophosphatum.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

May be made by dissolving a grain of ferrous lactate in each drachm of syrup of calcium lactophosphate.

References to Lactic Acid.

In phthisis, 10 minims twice a day, to allay cough and quench thirst, has been found useful.

In chronic catarrh of the bladder, lactic acid drinks arrest the ammoniacal decomposition of the urine, both inside as well as outside this organ, dissolve the salts and are said to stop the development of micro-organisms.

Pure acid as a paint, or in a paste with kaolin, or as a 50% injection, destroys lupus, but is painful.

Local use of lactic acid successful in tuberculous ulceration of pharynx and larynx.—L. ii./92,1162.

As a caustic to corneal ulcers.—L. ii./94,152; i./95,1452.

Laryngeal papillomata treated with 2% solution.—B.M.J. ii./04,1224; ii./05,1191-1196.

ACIDUM NITRICUM (*Off.*).

HNO_3=62·58 (63·048 I. Wts.).

Dose.—1 to 4 minims (0·06 to 0·24 Cc.).

Sp. Gr. 1·42, contains 70% by weight hydrogen nitrate. **U.S.** 68%. **Ph. Ned.** 50%. Sp. Gr. 1·316.

Preparation.—Distillation of sodium or potassium nitrate and sulphuric acid.

Use.—Strong oxidising agent. Is used as a caustic to warts and condylomata.

Acidum Nitricum Dilutum (*Off.*).

Dose.—5 to 20 minims (0·3 to 1·2 Cc.).

Contains 17·4% of Hydrogen Nitrate (in 6 fluid drachms one molecular weight in grains). **U.S.** is 10%. **Ph. Ned.** quadrinormal. Tonic and biliary stimulant.

It has been suggested that the acids and alkalis of the Pharmacopœia should be made of a volumetric strength, so that they would all be simple multiples of each other, and that they should be prepared on volumetric test solution principles.—P.J. ii./03,619.

Incompatible with alkalis, sulphides, hyposulphites, ferrous sulphate, and alcohol.

Antidotes as for Hydrochloric Acid, *v.p.* 36.

Chloroform in 5 drop doses every ten minutes will prevent the convulsions following the inhalation of nitrous fumes, as in the accidental breaking of a bottle of nitric acid.—C.D. ii./05,130.

Acidum Nitricum Fumans. Sp. Gr. 1·5. P. Jap. (P.G. 1·45 to 1·5).

A reddish-brown liquid, giving off yellowish-red fumes on exposure. Contains about 91% by weight of hydrogen nitrate. Is frequently used as a caustic.

Acne pustulata should be stabbed with a pointed stick dipped in Nitric Acid.—B.M.J. i./01,513.

Diphenylamine $(C_6H_5)_2NH = 167·86$ (169·128 I. Wts.) in 1% solution in sulphuric acid is a very delicate test for nitric acid, giving a blue ring on properly layering, *vide* also Water Analysis, *p.* 854.

In the basic condition it is practically insoluble in water and soluble about 1 in 8 of alcohol, 90%.

Arhovine.—Diphenylamin Ethylthymyl benzoate, $C_6H_4.C_{10}H_{13}.COO.C_2H_5.(C_6H_5)_2NH = 447·91$ (451·304 I. Wts.). *Dose.*—4 minims in capsule. In gonorrhœa also used as bougies, 0·01 to 0·05 Gm. in each.—F.N. 1906,27.

Acidum Nitro-hydrochloricum, U.S. (Strong).

Nitric acid 9, hydrochloric acid 41, to produce 50.

Aqua Regia is nitric acid 3, hydrochloric acid 4.

Acidum Nitro-hydrochloricum Dilutum (*Off.*).

Dose.—5 to 20 minims (0·3 to 1·2 Cc.).

Nitric acid 3, hydrochloric acid 4, distilled water 25. Mix, and keep 14 days (this is not necessary as far as strength goes). U.S. has nitric acid 20, hydrochloric acid 91, water to 500.

Uses.—Biliary and liver stimulant. Is a good addition to preparations of cinchona.

ACIDUM OSMICUM.

$OsO_4 = 255$ (I. Wts.).

Syn. Osmium Tetroxide, Hyperosmic Acid.

Dose.—$\frac{1}{64}$ grain (0·001 Gm.). Maximum daily dose $\frac{1}{10}$ grain (0·0065 Gm.).

Is in large yellow crystals, which soften like wax. Its vapour is intolerably pungent. Its taste is acrid but not acid to test. Soluble slowly about 1 in 50 of water. It is poisonous and a powerful oxidizing body.

Liquor Acidi Osmici, 1% (in water).

Dose.—2 to 10 minims (0·12 to 0·6 Cc.), hypodermically.

Is much used for hardening animal tissues preparatory to mounting as microscopic objects; fat and medullary matter are blackened by it. Solutions must be carefully prepared, as contamination is liable to reduce to metallic osmium, and it so blackens nearly everything.

This and **Potassium Osmate** 1% solution have been injected hypodermically for neuralgia, for strumous glands, sarcoma, and cancer; also sciatica and muscular rheumatism, and given internally in epilepsy.—B.M.J.E. ii./96,83; L. ii./99,1220.

Trigeminal neuralgia treated by injections of small quantity of 2% solution.—M.P. ii./04,470.

Injected into goitrous swellings twice a week, gave permanent relief.—Pr. xxxiv.48.

Liquor Acidi Chromo-Aceto-Osmici (Flemming's).

Mix Glacial Acetic Acid 100 with Osmic Acid 8 in water 400, and Chromic Acid 15 in water 1500.

As an external application and injected into cancerous growths: this solution is also known as Flemming's Strong Solution for fixing, in histology.

8 Cc. of this solution are injected at edge of tumour, or 17 minims (1 Cc.), just beneath its surface.—M. 1902, 11. Microtomists' Vade Mecum, A. B. Lee. 1896.

ACIDUM OXALICUM.

$(COOH)_2\ 2H_2O = 125{\cdot}10$ (126·048 I. Wts.).

White crystals soluble in water about 1 in 9; a powerful poison. The cerium and iron salts are used in medicine, *q.v.*

Antidotes.—Apomorphine injection, calcium saccharate solution, chalk, castor oil, stimulants.

Sal Limonis—Salt of Sorrel or Sal Acetosella, Salacetos, consists of a mixture of Acid Potassium Oxalate $COOH.COOK + H_2O = 145{\cdot}05$ (146·174 I. Wts.) and Potassium Tetroxalate $COOH.COOK + COOH.COOH + 2H_2O = 252{\cdot}27$ (254·206 I. Wts.) (Bernthsen). It is largely used for removing ink stains, iron mould, cleaning leather, &c., and removing the colour from calico printing. Has been given for scurvy. Is very poisonous.

ACIDUM PHOSPHORICUM CONCENTRATUM. (*Off.*).

$H_3PO_4 = 97{\cdot}32$ (98·024 I. Wts.).

Dose.—1 to 4 minims (0·06 to 0·24 Cc.).

Antidotes as for hydrochloric acid, *q.v.*

This acid is produced by the oxidation of phosphorus either by the aid of the atmospheric oxygen or by heating with nitric acid.

Hydrated Phosphoric Acid, containing 66·3% of hydrogen orthophosphate, corresponding to 47·4% of phosphoric anhydride; Sp. Gr. 1·5. Commercially, it is also prepared, having Sp. Gr. 1·75, and containing 64·3% of the anhydride = 88·8% H_3PO_4 (U.S. is 85% H_3PO_4). If of this strength, it may be reduced to B.P. strength by adding to each 3 parts by weight 1 part of distilled water.

Acidum Phosphoricum Dilutum (*Off.*).

Dose.—5 to 20 minims (0·3 to 1·2 Cc.).

Contains 13·8% H_3PO_4 or 10% of phosphoric anhydride. Sp. Gr. 1·08. (U.S. has 10% H_3PO_4. **P. Austr.** 'Acidum Phosphoricum,' Sp. Gr. 1·12, 20% H_3PO_4.)

Concentrated Phosphoric Acid 3 ounces (fluid), Distilled Water *q.s.* to 20 ounces at about 60° F.

By weight, to 4½ ounces of the acid add 17$\frac{1}{10}$ ounces of distilled water; or the same result may be obtained by diluting 4 parts, by weight, of acid Sp. Gr. 1·75 with 21 of distilled water. Incompatible with alkalis.

'Acidum Phosphoricum,' Ph. Ned., is 25% H_3PO_4. Sp. Gr. 1.15.

Uses.—Said to increase the proportion of phosphates in the red blood corpuscles. Well diluted, is a pleasant cooling drink in fevers, and relieves thirst in diabetes.

It renders iron preparations compatible with astringent vegetable infusions. A nerve tonic and hæmatinic.

Alexine. *Dose.*—1 drachm.

A proprietary preparation of phosphoric acid and sugar in pink granules. Also stated to contain manganese and iron. Said to increase the acidity of the blood. For use in anæmia, phthisis, alkaline dyspepsia and microbic diseases.

Acidum Glycerophosphoricum (*Medicinal*).
$C_3H_5(OH)_2O.PO.(OH)_2$=170·81 (172·072).
Dose.—5 to 10 minims (0·3 to 0·6 Cc.).
This dibasic acid forms a colourless, sour liquid, miscible with water and alcohol. It may be prepared by heating Glycerin with two-thirds of its weight of Phosphoric Acid 60%, until 190° C. is reached, and Acrolein fumes are given off. The liquid (of brown colour) is neutralised with calcium carbonate. The solution of Calcium Glycerophosphate is concentrated in vacuo (Caspari, 536) or precipated by alcohol, collected and dried. This may be converted into the (purified) acid or other salts.

As made by Merck is 25% and has Sp. Gr. 1·125. According to Caspari cannot be made stronger than 20%. Yet we note in trade list "50%" and "pure" quoted.
In addition to the mono-ester above indicated the so-called di-ester $C_3H_5(OH)\begin{matrix}O\\O\end{matrix}PO.OH$ and the tri-ester $C_3H_5 : PO_4$ can be prepared under varying conditions.
The question as to whether the synthetic mono-ester is identical with the acid obtained from lecithin is not definitely settled. Both a symmetrical and unsymmetrical

$$\begin{matrix}CH_2OH\\CH.O.PO(OH)_2\\CH_2OH\end{matrix} \text{ and } \begin{matrix}CH_2O.PO(OH)_2\\CH.OH\\CH_2OH\end{matrix}$$

acid are possible.—C.D. i./05, 394.

Calcii Glycerophosphas, $C_3H_7O_3.PO_3Ca + H_2O$= 226·40 (228·172 I. Wts.), P. Belg.
Dose.—3 to 10 grains (0·2 to 0·65 Gm.) in water.
The calcium salt of glycerophosphoric acid, which is formed, together with choline, on the breaking up of lecithin in the process of digestion. It is a white crystalline powder, soluble in cold (1 in 20, Caspari), only slightly so in hot water, and is the most suitable salt for administration.
Uses.—It improves general nutrition of the nervous system, in all cases where nerve activity is enfeebled; may be given hypodermically, 2 to 4 grains daily in water. It is useful *per os* for incontinence of urine.

Ferri Glycerophosphas, $C_3H_7O_3.PO_3Fe + 2H_2O$= 260·17 (261·988 I. Wts.).
Dose.—1 to 5 grains (0·065 to 0·32 Gm.). In whitish powder, or in scales, slightly soluble in water.—
Pilula Ferri Glycerophosphatis (*Robin*).
Iron Glycerophosphate 0·05 to 0·1 Gm., Rhubarb 0·05 Gm., Extract of Cinchona 0·15 Gm. One pill

with meals.—P.J. 1895, 1191. A **Wine** contains 1%, with Glycerin 5% in Sherry.

Lithii Glycerophosphas, $C_3H_7O_3.PO_3Li_2 = 182{\cdot}75$ (184·116 I. Wts.), and

Magnesii Glycerophosphas $C_3H_7O_3.PO_3\ Mg = 192{\cdot}99$ (194·416 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.) and

Manganesii Glycerophosphas, $C_3H_7O_3.PO_3\ Mn. = 223{\cdot}33$ (225·056 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Are white amorphous powders soluble in water.

Potassii Glycerophosphas. $C_3H_7O_3.PO_3K_2 + H_2O = 264{\cdot}35$ (264·372 I. Wts.)

Dose.—3 to 8 grains (0·2 to 0·52 Gm.)

A yellowish syrupy liquid in 50 and 75% solutions and 100% (yellowish mass).

Quininæ Glycerophosphas. *Syn.* KINEURINE.

Dose.—3 to 8 grains (0·2 to 0·52 Gm.).

A white powder, soluble in alcohol, but only very slightly in water.

According to Carré (Bull. Soc. Chim. de Paris, 1904, 803) the "basic" Salt $C_3H_7O_3PO_3H_2(C_{20}H_{24}N_2O_2)_2 = 814{\cdot}49$ (820·616 I. Wts.) is obtained by mixing alcoholic solutions of the acid (one molecule) and Quinine 2 molecules. The salt then has the above formula if crystallised from absolute alcohol. If from 80% alcohol it has $4H_2O$. Dehydrated it melts at 148·5°C. A "Neutral" Salt $C_3H_7O_3PO_3H_2(C_{20}H_{24}N_2O_2) + 2H_2O = 528{\cdot}41$ (532·376 I. Wts.) can also be made by employing equimolecular proportions of the acid and the base. This melts at 151° to 152° C.

Carré in a paper on Glycerophosphoric Acid in the *Comptes Rendus* 1903, *137*, p 1071, states that this acid is monobasic to methyl orange, although dibasic to Phenolphthalein. Similarly Phosphoric Acid itself is dibasic to methyl-orange.

The trisodium phosphate and the disodium glycerophosphate are strongly alkaline, or basic, in solution and probably exist in water as $Na_3PO_4 + H_2O \rightleftarrows Na_2HPO_4 + NaOH$.

$Na_2PC_3H_7O_6 + H_2O \rightleftarrows NaHPC_3H_7O_6 + NaOH$ owing to ionic and hydrolytic dissociation combined. So far as the soluble ionised salts are concerned, phosphoric and glycerophosphoric acids are dibasic and monobasic respectively, the *neutral* salts being Na_2HPO_4 and $NaHPC_3H_7O_6$ respectively. Hence by analogy the corresponding neutral quinine salt should be

$$\bar{Q}_2H_3PO_4 \text{ and } \bar{Q}H,HPC_3H_7O_6 = \begin{array}{l} CH_2OPO<^{OH\bar{Q}}_{OH} \\ \dot{C}H.OH \\ \dot{C}H_2.OH \end{array}$$

Therefore the basic Quinine Salt will be :—$\begin{array}{l} CH_2OPO\ (OH\bar{Q} \\ \dot{C}H.OH \end{array}$

Kugloids are capsules containing Creosote and Eucalyptol, combined with Benzoic Acid and Quinine Glycerophosphate; are recommended for influenza, pharyngitis and bronchitis.

Sodii Glycerophosphas. $C_3H_7O_3.PO_3Na_2,7H_2O$ = 339·73 (342·268 I. Wts.)

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

In the pure condition (100%) this compound is in crystalline lumps. The 75% product is a translucent straw-coloured mass which cannot be poured without warming. A 50% dilution is therefore supplied for the sake of convenience. Useful in nervous affections, anæmia and general debility.

Sanatogen is a food specialty said to contain this salt and casein. Given in mental disorders and for rickets.—P.J. i./01,755; M.P. ii./04,457.

Strontii Glycerophosphas. $C_3H_7O_3.PO_3Sr$ = 257·656 I. Wts.

Dose.—3 to 8 grains (0·2 to 0·52 Gm.).

Elixir Glycerophosphatum.

Calcium Glycerophosphate 2, Sodium Glycerophosphate 2, Iron Glycerophosphate 1, Aromatic Syrup, B.P. 250. *Dose.*—1 to 4 drachms (3·5 to 15 Cc.).

Glycerinum Glycerophosphatum Compositum.—*Syn.* GLYCEROLE OF GLYCEROPHOSPHATES. *Dose.*—1 to 2 fluid drachms.

Cudbear* ¼ ounce, Water 10 ounces. Boil 10 minutes, strain, and dissolve in the warm liquor—Calcium Glycerophosphate 160 grains, Potassium, Sodium, and Magnesium Glycerophosphates of each 80 grains, Iron Glycerophosphate 40 grains, Citric Acid 30 grains; add Tincture of Kola 10 drachms, Tincture of Ignatia Amara 1 ounce, and Glycerin *q.s.* to 1 pint. This is more palatable than if made with Strychnine and Caffeine, as in Syrupus Glycerophosph. Co. B.P.C. It keeps well and is particularly suitable for export, and for patients to whom it is undesirable to give sugar.

Glycerol Glycerophosphatum cum Medulla Rubra. GLYCEROL OF GLYCEROPHOSPHATES, with Red Bone Marrow.

Dose.—1 to 2 drachms (3·5 to 7·0 Cc.).

Dissolve Calcium Glycerophosphate 80 grains, Iron

* A purplish red powder obtained by the ammoniacal fermentation of *Lecanora tartarea* and other lichens.

Glycerophosphate 20 grains, Magnesium Glycerophosphate 40 grains, Manganese Glycerophosphate 20 grains, Potassium Glycerophosphate 40 grains, Sodium Glycerophosphate 40 grains, and Citric Acid 15 grains in distilled water 10 ounces; then filter and add Chloroform 5 minims, Alcohol (90%) 40 minims, Orange-flower Water 1 drachm, Cherry-laurel Water 1½ drachms, Glycerin Extract of Red Bone Marrow 10 ounces.—P.J.i./06,385. Given in rickets and debility.

Granular Effervescent Glycerophosphates.

Dose.—60 grains (2·0 Gm.).

Contains in 1 drachm, Glycerophosphate of Calcium 3 grains, of Iron 1 grain, of Magnesium 3 grains, of Potassium 3 grains; with Caffeine Citrate 1 grain. A palatable mode of administration.

Compound Glycerophosphate Tablets are prepared containing in each the same quantities as the latter per drachm. To be crushed and drunk in a little warm water.

Malted Glycerophosphates.

Dose.—1 to 4 drachms.

Sodium Glycerophosphate 1, Potassium Glycerophosphate 1, dissolved in Water 30, Liquid Extract of Malt 90.

A very slight deposit forms. Experiments with a view to including other glycerophosphates, *e.g.*, those of magnesium and calcium did not give preparations which will remain clear.

Syrupus Glycerophosphatum Compositus, B.P.C. *Dose.*—1 to 2 fluid drachms.

Cudbear* ¼ ounce, Distilled Water 10 fluid ounces. Boil ten minutes, filter and dissolve in the warm filtrate—Calcium Glycerophosphate 160 grains, Potassium Glycerophosphate 80 grains, Sodium Glycerophosphate 80 grains, Magnesium Glycerophosphate 80 grains, Iron Glycerophosphate (in scales) 40 grains, Citric Acid 30 grains, Caffeine Citrate 80 grains, Strychnine Hydrochloride 2 grains. Then add Refined Sugar 14 ounces. Heat until dissolved, and strain. When cold, add (mixed) Chloroform 20 minims, Alcohol (90%) 40 minims, and Distilled Water *q.s.* to 1 pint.

Capsules are prepared equivalent to ½ and 1 drachm

* See page 49.

yrupus Glycerophosphatum (*Robin*) is a special preparation. *Dose.*—1 to 4 drachms.

yrupus Glycerophosphatum cum Formatibus. Contains Sodium and Potassium Formates of each 3 grains added to each drachm of above.

mulsio Olei Morrhuæ et Glycerophosphatum. *Dose.*—2 to 8 drachms (7 to 30 Cc.). Contains the Glycerophosphates of Calcium, Iron, Magnesium, Potassium, Sodium, combined with Cod Liver Oil Emulsion, containing 50% Cod Liver Oil. s a useful nutrient combination.

Vinum Glycerophosphatum (*Labesse*). Contains about 1% each of Calcium and Sodium Glycerophosphates in a bark and kola wine.
Dose.—½ to 2 ounces (15 to 60 Cc.).

Glycero-arsenates are analogous to the Glycerophosphates. The Calcium Salt is used for phthisis and skin affections.
Dose.—$\frac{1}{6}$ grain (0·01 Gm.) in pill.

ACIDUM PICRICUM.

Syn. CARBAZOTIC ACID; TRINITROPHENIC ACID. $C_6H_2.OH.NO_2.NO_2.NO_2$ 1:2:4:6 = 237·44 (229·144 . Wts.). *Dose.*—$\frac{1}{4}$ to 2 grains (0·016 to 0·13 Gm.).
Is formed by dropping phenol into fuming nitric cid, heating the mixture, and purifying by re-crystalizing. It is in yellow, shining, bitter tasting crystals.
Solubility.—1 in 95 of water with yellow colour, nd 1 in 10 of alcohol 90%. ***Use.***—Solutions or ointnent are applied in the treatment of burns, erysipelas, ruritus, eczema, gonorrhœa. The ammonium and potasium salts have been thought to act like quinine; also or hardening tissue in microscopy, and as a urine test or albumin, *q.v.*

Gauze, Picric Acid. For burns (6 yard pieces).

Lotio Acidi Picrici, 1% aqueous (St. Th. H.)
Cotton wool impregnated with this lotion is used for urns.—B.M.J. i./99,1152. But may be attended with langer of toxic action.—L. ii./03,580,799,925; i./04,247; P.J. ii./02,441; L. i./06,1175, 1336. *Vide* Gauze, above. Recommended by H.M. Inspectors of Explosives to keep handy as First Aid for burns.

Successful use for erysipelas and inflammatory conditions of skin, as a pigment, 5 to 10 times a day.—B.M.J. i./89,678; L. i./89,702.

Jaundice and recovery after poisoning by picric acid.—B.M.J. i./96, 146. Other uses.—B.M.J. i./97,457.

Ointment, 1 to 3%, for pruritus of scrotum.

As a lotion is of use for intertrigo, eczema, soft corns and to dress the sore of an in-grown toe nail.—B.M.J. i./03,422; B.M.J.E.ii./03,20.

In gonorrhœa, solutions and ointments ½ to 2% strength have been employed with good results.

Chilblains: The ordinary Esbach Reagent, *q. v.*, is excellent for unbroken. Applied two or three times a day.—P.J. i./05,299. Burns, eleven years' experience, found very useful both as immediate application and some time after accident.—P.J. ii./05,269.

'Collapsubes' of Picric Acid Ointment, ½% in soft paraffin basis, are supplied with catheter attachment for urethral medication.

Wool, Picric Acid. For burns in 1 lb. rolls.

Papillary erosions of the cervix well treated with saturated solution of picric acid in methylated spirit only to be swabbed for two or three minutes two or three times a week.—B.M.J. ii./05,1205.

Ammonium Picrate.

$C_6H_2(NO_2)_3O\,NH_4 = 244{\cdot}38$ (246·208 I. Wts.).

Dose.—⅛ to 1½ grains (0·008 to 0·1 Gm.) four or five times a day.

Yellow crystals exploding if heated or percussed.

Soluble about 1 in 90 of water and 1 in 90 of alcohol 90%. ***Uses.***—For ague and malarial fevers and in exophthalmic goitre.

Picric acid and picrates are treated by Government authorities as explosives, but there is no interference unless more than 5 lbs. at a time is kept.

ACIDUM PYROGALLICUM.

$C_6H_3\,(OH)_3$ 1:2:3 = 125·1 (126·048 I. Wts.).

Syn. PYROGALLOL, I.C. Add., P.G.

Dose.—½ to 1½ grains (0·032 to 0·1 Gm.) in aqueous solution, or in pills with syrup—these must be freshly prepared, and kept from the light.

Manufacture.—Heat gallic acid to 185° or 0° C.

A specially pure acid designated "Resublimed Medinal," is prepared for internal administration.

In light small white odourless crystals, producing a nsation of coolness on the tongue.

Solubility.—Soluble in 2 parts of water, about in 1 of alcohol 90%, and in 10 parts of melted lard.

It has great affinity for oxygen.

Uses.—Antiseptic in skin affections and in ringworm. sinfectant. It darkens the skin, used with silver nitrate ackens the hair. Large doses poisonous.

Pyrogallol is an internal astringent for hæmoptysis doses of a grain every half hour. It has been prescribed with ergot for the same purpose and is stated ot to cause vomiting nor to derange the stomach.

Diluted nitro-hydrochloric acid may obviate the toxic fects.

Stains made by pyrogallol may be removed by rubbing mmonium persulphate, *q.v.*; and rinsing with water.—J.i./98,5?4a.

nguentum Acidi Pyrogallici, B.S.H.

Syn. JARISCH'S OINTMENT. Pyrogallic Acid 60 ains, Lard 1 ounce. Mix. The acid will be in lution if the lard be melted. Used in cases of psoriasis. t. Th. H. prepares with soft paraffin, of 2 and 5%.

nguentum Pyrogallol Compositum (Unna).—
Mid. H. Pyrogallol 5, Salicylic Acid 2, Ichthyol 5, Soft Paraffin 88.

For psoriasis and other cutaneous affections a 10% ntment is useful.

It is recorded that a patient suffering from universal soriasis was poisoned by pyrogallic ointment applied one-half of his body, whilst to the other half chrysohanic acid ointment was applied for comparison.

Acidum Pyrogallicum Oxidatum (*Syn.* YRALOXIN) is prepared by the action of air and mmonia on Pyrogallic Acid. It is in the form of a rownish powder readily soluble in water; is used in 10% ntment for psoriasis, chronic eczema and erythematous upus.—M.Index, 1902.

Or a 10% "solution" in a mixture of benzol 1 and acetone may be used.—Edin. Medical Journal, 05,437. We do not nd this "soluble" at all, nor in acetone alone 1 in 10, nor

in benzol alone. Further formula :—Zinc oxide 10, kaolin 2 oxidised pyrogallic acid 5, vaseline 28.

Eczematous surfaces may be treated with a coating o Lassar's Paste (*q.v.*) containing 3% pyraloxin.

Ringworm Ointment.—Pyrogallic acid oxidised 1(grains, precipitated sulphur 30 grains, ammoniate mercury 15 grains, vaseline 1 ounce.

Eugallol, $C_6H_3(OH)_2(CH_3COO) = 166{\cdot}8$ (168·06 I. Wts.), Pyrogallol-Monacetate, a yellowish syrup liquid, is claimed to be more powerful than Pyrogallol mixed with an equal quantity of acetone it may b applied with a brush for psoriasis. **Lenigallol,** Pyro gallol-Triacetate, $C_6H_3.(CH_3.COO)_3 = 250{\cdot}2$ (252·09 I. Wts.) in white powder, is much weaker, may b used with zinc paste in acute and chronic eczema.

Saligallol, Pyrogallol-Salicylate, a resinous lookin substance, is soluble in acetone and chloroform, an similarly used.—P.J. ii./99,176; i./00,616.

Gallacetophenone.

$C_6H_2(OH)_3.CO.CH_3 = 166{\cdot}8$ (168·064 I. Wts.)

Supplied in yellowish-brown **powder** or needl (freely soluble in alcohol, ether, glycerin, slightl in water), and in 20% **solution.** Parasiticide.

Is slowly oxidised and relatively non-poisonous. 10% ointment does not stain linen, and is said t act quickly in psoriasis and other non-syphilitic ski affections.—P.J. 1891,346; M.C. April 1892,63.

ACIDUM SALICYLICUM (*Off.*).

$C_6H_4.OH.COOH$ 1:2 = 137·01 (138·048 I. Wts.).

Syn. ORTHO-OXY-BENZOIC ACID.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) in cachets

In colourless prismatic crystals, odourless, but its du irritates the nostrils, taste sweetish. Melting poi 156° to 157° C.

Soluble 1 in 500 of cold water, 1 in 3 of 90% alcohol, 45% alcohol 1 in 40, 1 in 2 of ether, abo 1 in 80 of olive or almond oil, 1 in 100 of castor o 1 in 200 of glycerin, and 1 in 55 chloroform; solub also in melted fats and soft paraffin; 20 grains salicylic acid are rendered soluble in an ounce of wat

by the addition of 25 grains of borax. Ammonium citrate and sodium phosphate also increase its solubility.

Incompatibility.—Spirit of nitrous ether, quinine salts, sal volatile.

An aqueous solution of the acid gives a deep violet colour with a trace of a persalt of iron.

Salicylic acid may be prepared from salicin and from oil of wintergreen (*Gaultheria procumbens*,—*Ericaceæ*) and sweet birch (*Betula lenta*,—*Betulaceæ*), (*natural* acid) or by the action of carbonic anhydride on phenol (*artificial* acid).

For internal use this natural acid and its salts are preferred. An artificial "**Salicylic Acid, Physiologically Pure,**" in large prismatic crystals, melting at 156·8° C., is also free from impurities.

Detection of, when used as Preservative.—Concentrate liquid (distil off any alcohol) in presence of Alkali and Sodium Chloride, acidify and shake out with Chloroform, evaporate and add Ferric Chloride Solution, red colour.—P.J. ii./05,279. Its use to preserve foods, where otherwise rapid decomposition would occur in hot weather, is upheld.—L. ii./04,638,916,963; B.M.J. ii./04,854; i./05,455.

A Departmental Committee inquired into use of preservatives and colouring matters added to foods. Not more than 1 grain per pint of liquid and 1 grain per pound of solid food is permissible. Presence may impair digestion, but said not to be injurious.—L. i./03,717; ii./04,1544.

Uses.—Salicylic acid prevents fermentative and putrefactive processes and is used as an antiseptic dressing. It has no smell and causes no local irritation, but it is not volatile, and therefore does not affect the surrounding atmosphere. It has been given for various febrile conditions, but particularly for acute rheumatism. It is more generally employed as sodium, lithium or bismuth compounds.

Internally, its effects closely resemble those of quinine, even to the production of ringing in the ears and transient deafness. Large doses alone act as a direct poison on the heart and respiration. It is only partly destroyed in its passage through the organism, and reappears in the urine as late as fifty hours after it has been taken, partly as such and partly as salicyluric acid.

In chorea give sufficient to produce singing in the ears.—M.A. 1906, 154.

Rectal Injection.

A saturated aqueous solution has been used for dysentery of children.

To eradicate stumps left after removal of papillomatous growths 1 to 6% solutions in spirit. It may also be used dissolved with sodium sulphoricinate.—B.M.J. i./04,1221,1224.

The following **sterile solutions and suspension** of Salicylic Acid have been proposed for **Hypodermic use** at the seat of rheumatic pain:—

Salicylic Acid—1 in 100 of olive oil.
" 20 grains, with borax 25 grains in water 1 ounce.
" 10 grains suspended in 60 minims of vaseline oil, *q.v.*

Amyl Salicylate. $C_6H_4.OH.COO.C_5H_{11} = 206{\cdot}56$ (208·128 I. Wts.)

Substitute for Methyl Salicylate, with much less odour. Non-toxic, and non-irritant when applied to the skin. Painted on to the affected joints.—P.J. i./01,138.

Capsules of Amyl Salicylate contain 3 grains (0·2 Gm.) for internal medication.

Salit. *Syn.* BORNEOL SALICYLATE.

Uses.—Muscular rheumatism and acute neuralgia, by inunction or by painting over affected part. Apply ½ to 1 drachm, with equal quantity of olive oil.

Oleum Gaultheriæ, I.C. Add., *v.p.* xxvii.

Maceration for 12 to 24 hours of the leaves prior to distillation necessary for best yield, the oil being a "ferment" oil not pre-existing in the plant, but occurs as a non-odorous glucoside, which must be hydrolised by the ferment before distilling.—P.J. ii./05,224.

Capsules of Oil of Gaultheria.—10 minims in each. *Dose.*—1 three times a day or oftener.

The oil has similar properties to salicylic acid. 10 to 20 minims are given every 3 or 4 hours in rheumatism and sciatica. With olive oil externally.

Oil of Wintergreen recommended as an external application for rheumatism.—L. i./97,1485; B.M.J.E. ii./97,79; and for chorea.—B.M.J.E. i./99,8.

Methyl Salicylas. $C_6H_4.OH.COO.CH_3 = 150{\cdot}92$ (152·064 I. Wts.). Artificial (or Synthetic) Oil of Wintergreen, U.S.

A colourless liquid, with odour like above oil. *Soluble* in 90% alcohol, ether, chloroform or glacial

acetic acid. Spread on the skin and covered by impermeable tissue is quickly absorbed, and is said to be less irritating than the natural oil.—B.M.J.E.i./98,103.

As an antiseptic dressing in furunculous ulcers.—P.J. i./00,183.

Recommended for orchitis and mumps.—B.M.J.E. i./99,63; P.J. ii./00,541.

Spiritus Gaultheriæ, U.S. 1 in 20 alcohol (U.S.). *Average dose.*—30 minims (2 Cc.)

Unguentum Methyl Salicylatis. 1 in 8 of Lanolin. Cures rheumatic pains of the limbs.—W.W.W.

Methyl Salicylate Plasters are prepared of size 5 inches by 7 inches, and are useful in lumbago, sciatica, and rheumatism.

Ethyl Salicylate. $C_6H_4.OH.COOC_2H_5 = 164{\cdot}83$ (166·08 I. Wts.).

A colourless liquid with aromatic odour. Soluble in alcohol. Injected subcutaneously or intravenously. Not nearly so toxic as methyl salicylate. Stated not to be absorbed into the system either by inhalation or when applied to the skin.—Am. Jl. Phys., 1905,331.

Methyl Rhodin. $C_6H_4{<}^{O.CO.CH_3}_{COO.CH_3} = 192{\cdot}62$ (194·08 I. Wts.). *Dose.*—5 to 8 Gm. per diem. Methyl acetyl salicylate. Colourless crystals, soluble in alcohol and oils. Analgesic, antirheumatic.—F.N. 1906,187.

Mesotan, the methoxy-methylester of Salicylic Acid, is without the odour of Methyl Salicylate. Soluble in 90% alcohol, ether or chloroform. Is used in in solution in olive oil about 1 to 2 for inunction in rheumatism, angina, pleuritis and gout.—B.M.J.E. i./03,44; ii./03,80; i./05,20; L.ii./04,1293. May cause a rash on the skin.—B.M.J. i./05,881.

Is decomposed by water, must be dispensed in carefully dried bottles, and the skin must be washed with a little spirit before applying the preparation which must be diluted with olive oil.—Luff. Clin. Jl., Oct. 11,1905.

Ulmaren. - Is of similar composition and use to the latter. Miscible with alcohol, chloroform, ether and oils, and may be applied to the skin with menthol and wool fat.

Gelatin Capsules of Ulmaren for internal administration contain 8 minims (0·5 Cc.).

Granular Effervescent Salicylic Acid contains 5 grains in 60 grains. *Dose.*—1 drachm (4 Gm.).

Collemplastrum Salicylicum, P. Austr., contains 4% Salicylic Acid, with 20% Petroleum Ether evaporated in **Collemplastrum Adhæsivum, P. Austr.** Soak Oleum Resinæ Empyreumaticum 6, Resina Elastica 1·5, Æther Petrolei 45, several days to dissolve with shaking, and add previously prepared Copaiba Balsam 4, Resina Colophonii 4, Adeps Lanæ 2, Cera Flava 2, Resina Sandarachi 2, Radix Iridis 9, Ether 16. Heat to a suitable mass and spread on lint (allowing the Petroleum Ether to evaporate in the air.

Emplastrum Saponatum Salicylatum. Austr., contains Emplastrum Saponati 85, White Wax 5, Salicylic Acid 10.

Emplastrum Saponati, P. Austr., contains Emplastrum Plumbi Simplicis, P. Austr., 75, White Wax 13, Sapo Medicinalis 7, Oleum Camphoratum 5.

Emplastrum Plumbi Simplex, P. Austr., contains Lard, Sesame Oil and Lead Oxide equal parts. **Oleum Camphoratum, P. Austr.,** contains Camphor 1, Sesame Oil 3. **Sapo Medicinalis, P. Austr.,** is made with Lard and Sodium Hydroxide.

Oleum Resinæ Empyreumaticum, P. Austr. (crude) is from Colophony ; *s.g.* 0·96—0·99.

Liquor Acidi Salicylici.

Boiling distilled water 1000 parts, Salicylic Acid 1½ parts. Useful in preparing solutions of alkaloidal salts, and may be employed as a stable solvent for other salts prone to develop fungi in solution, but if used of this strength (nearly saturated) it proves irritating to the eyes.

Pasta Acidi Salicylici. Salicylic Acid 1, Glycerin 9.

Guttæ Acidi Salicylici Compositæ, St. M.'s H. Salicylic Acid 10 grains, Boric Acid 20 grains, Glycerin 2 drachms, Methylated Spirit to 1 ounce.

Pulvis Salicylicus cum Talco, P.G.

Salicylic Acid 3, Wheaten Starch 10, Talc 87.

Mix to a fine powder. For perspiration of the feet.

Salicylic Cream.

Salicylic Acid, in powder, 2, Carbolic Acid 1, Glycerin 10 ; mix. G.H. has Salicylic Acid 1, Glycerin 9.

Used as pigment when the skin is irritated by the discharge from wounds, &c., under antiseptic dressings.

Unguentum Acidi Salicylici (*Off.*).

Salicylic Acid, in powder, 1, Paraffin Ointment, white, 49. Useful in eczema, acne, ringworm and cancer.

In seborrhœa, Salicylic Acid 1, Precipitated Sulphur 2·5, Rose Water Ointment 25 is useful.

Wool, Salicylic, Absorbent. 4 and 10% 1lb. rolls.

Aseptic Wax. (Squire.)

Beeswax 87; Almond Oil 12; Salicylic Acid 1. Heat to 150°C. Keep in sterilised bottles containing sufficient Mercuric Chloride Solution (1 in 500) to cover the wax.

For arresting hæmorrhage from cranial bones.—B.M.J. i./92,1165.

Baculum Acidi Salicylici, St. M.'s H.

Salicylic Acid 1, Wax 2, Lanolin 6.

Ammonii Salicylas, U.S. $C_6H_4.OH.COO\ NH_4$ = 153·95. (155·112, I. Wts.)

Dose.—5 to 30 grains (0·32 to 2 Gm.).

In crystalline powder, very soluble in water.

Effervescent Ammonium Salicylate.

Dose.—1 drachm or more.

Contains 10 grains in 1 drachm.

Calcii Salicylas. $(C_6H_4OH.COO)_2Ca + 2H_2O$ = 347·49 (350·212, I. Wts.).

Dose.—2 to 20 grains (0·13 to 1·3 Gm.). A white crystalline powder, odourless, with sweetish taste, slightly soluble in water, more so if containing dilute acids. Is useful, alone or with bismuth salicylate, in diarrhœa and gastro-enteritis.—P.J. 1891,427.

Ferri Salicylas. *Dose.*—3 to 10 grains (0·2 to 0·65 Gm.), in pills. A purplish brown powder, slightly soluble in water; given as an anti-arthritic tonic and for tonsillitis.

Found useful, on account of its antiseptic and astringent properties and its slight solubility as an application to foul wounds with a tendency to bleeding.

Magnesii Salicylas. $(C_6H_4.OH.COO)_2Mg, 4H_2O$ = 367·72 (370·504, I. Wts.)

Dose.—10 to 30 grains (0·65 to 2·0 Gm).

Colourless crystals. ***Soluble*** 1 in 6 of water. It has been given in typhoid fever.

Potassii Salicylas. $C_6H_4.OH.COOK$ = 174·84. (176·19 I. Wts.)

Dose.—5 to 30 grains (0·32 to 2 Gm.). A white crystalline powder, very soluble in water.

Sodii Salicylas (*Off.*). $C_6H_4.OH.COONa$ = 158·89 (160.09 I. Wts.) *Off.*—$(C_6H_4.OH.COONa)_2H_2O$ =335·66 (338.196 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.) in water—the taste may be disguised by the addition of liquid extract of liquorice, syrup of ginger, or tincture of orange—or in cachets. 5 of salt = 4 of acid.

Intravenous injections of 4 grain doses have been practised.

In white scales or shining tabular crystals (of sweetish taste), soluble in its own weight of water, 1 in 0·83 (P.J. i./02,552), soluble also in alcohol. For varieties in commerce, compare Salicylic Acid.

Incompatible with free ammonia, ammonium carbonate, and aromatic spirit of ammonia (turns brown). Mineral and many organic acids cause separation of salicylic acid.

Solubility in water of caffeine, theobromine, exalgin, phenol, menthol, creosote, guaiacol, and thymol is considerably increased by sodium salicylate.

Uses.—Rheumatism, neuralgia, possibly diarrhœa, vertigo, chorea, Menière's disease, malarial fevers, and diabetes may be all well treated by salicylates.

Its solution forms an antiseptic wash for the bladder.

Tablets, 3 and 5 grains (0·2 and 0·32 Gm.).

Effervescent Sodium Salicylate. This is prepared in two strengths—5 and 10 grains in a drachm. *Dose.*—1 drachm (4 Gm.) or more.

'Vescettes' of Sodium Salicylate. 5 grains. To be crushed and taken in a draught of warm water.

Injectio Sodii Salicylatis. *Dose.*—15 to 30 minims (0·9 to 1·8 Cc.).

1 in 20 of sterile water or weaker. Is injected at the seat of the pain in rheumatism.—P.J. ii./02,73; *c.f.* p.56.

In influenza and acute tonsillitis, 10 grains every three hours relieve the distressing symptoms.

Lauder Brunton protests against the saying that he gave salicylate of soda and bromide as Temper Powders.—B.M.J. ii./04,1615.

Pyrexia of tuberculosis treated by (with arsenic).—B.M.J.E./06,17.

In rheumatic fever, solutions may be given per rectum.—B.M.J.E. i./06,71.

Aspirin. *Syn.* **Salicyl-Acetic Acid.**

$C_6H_4(O.CO.CH_3)COOH = 178{\cdot}71$ (180·064 I. Wts.).

Dose.—10 to 15 grains in cachets or suspended in water.

A white microcrystalline powder prepared by action of acetic anhydride on Salicylic Acid. ***Soluble*** about 1 in 400 of water, 1 in 5 alcohol 90%. Passes unchanged through the stomach, decomposing only on reaching the alkaline intestinal juices. It forms a clear mixture with alkalis, *e.g.*, Sodium Bicarbonate, owing to dissociation, and should not be thus prescribed.

Heating Salicyl-acetic Acid in presence of moisture also causes dissociation.—P.J. ii./05,723.

Uses.—Has anti-rheumatic properties, and is used as a substitute for Salicylic Acid and its salts. Does not irritate the mucous membrane of the stomach, and is to be preferred in heart and ear complaints. Is quick in action in acute affections of the joints and in gout. —L. ii./99,219; P.J.ii./99,135; P.J. ii./00,734,775.

Has analgesic action.—L. i./03,984. Relieves the pain of cancer.—B.M.J.E. ii./04,4. In various children's diseases.—B.M.J.E. i./02,12.

In acute and chronic rheumatism and for pleurisy.—L.ii./02,51; /03,1293. In rheumatism.—L. i./05,1193.

Diabetes, facial neuralgia, dysmenorrhœa, and chorea well treated.—M. 01,47; 02,29; L. ii./03,526.

Dose of 15 grains causes poisonous symptoms.—B.M.J. ii./05,21. It may produce temporary deafness.

May cause gastric pain, vomiting, and giddiness; œdema of face and skin rash may occur.—L. ii./05,1518.

No advantage over Salicylic Acid and Salicylates.—L. i./05,84.

Tablets are prepared weighing 5 grains (0·32 Gm.), and 8 grains (0·52 Gm.).

Dymal consists mainly of Didymium Salicylate. It is prepared from a substance which results as a by-product in the manufacture of incandescent mantles. In the form of a 10% wool fat ointment it is advocated for various skin affections, notably dry and weeping eczema.—B.M.J.E. i./01,60. Has been used for profuse sweating of feet.

Glycosal. Mono-salicylic glycerin-ester.
$C_6H_4.OH.COO.C_3H_5(OH)_2 = 210{\cdot}5$ (212·096 I.Wts.).

Dose.—5 to 30 grains (**0·32 to 2·0 Gm.**)

A white crystalline powder only slightly soluble in water, but soluble 1 in 3 of 90% alcohol.

Is said to act as an antiseptic, preventing fermentation in the bladder. In cystitis. Resembles Salol and Salicylic Acid in anti-rheumatic effect, and is claimed not to disturb the digestive functions.

Externally in the form of ointment, is employed in chronic and squamous eczema.

Salacetol. $C_6H_4(OH).COO.CH_2CO.CH_3 = 192{\cdot}62$ (194·08 I. Wts.)

Dose.—10 to 30 grains (**0·65 to 2 Gm.**), in cachets or suspended.

Salicylic ester of acetone alcohol, an artificial glucoside of salicylic acid, in shining crystals, very slightly soluble in water, in alcohol 90% 1 in 14 easily. Caustic alkalis decompose it with formation of salicylates.

Taken internally it yields salicylic acid. Has been used successfully in choleraic diarrhœa and rheumatism as an intestinal antiseptic. For diarrhœa, it is recommended to be given in castor oil, before breakfast.

As a local application is un-irritating and never poisonous.—B.M.J.E.i./96,92; P.J.ii./96,373.

Saloquinine. $C_6H_4.OH.CO.O.C_{20}H_{23}N_2O = 440{\cdot}97$ (444·304 I. Wts).

Dose.—15 to 45 grains (**1 to 3 Gm.**) per diem as an analgesic; up to 90 grains (**6 Gm.**) per diem in malaria.

A quinine Salicylic Acid-ester: is a tasteless quinine substitute, insoluble in water, but soluble about 1 in 120 of alcohol 90%. Said to be prompt in action in malaria, and as a prophylactic to tropical fevers. Has germicidal and antiseptic properties.—P.J. ii./01,452; Pr. lxxiii.682.

Saloquinine Salicylate. *Syn.* RHEUMATIN.
$C_6H_4.OH.COO.C_{20}H_{23}N_2O,C_6H_4.OH.COOH = 577{\cdot}98$ (582·352 I. Wts.).

Dose.—15 grains (**1 Gm.**) repeated.

A white powder only slightly soluble in water, in alcohol 90% 1 in 35. In acute rheumatism.—P.J. ii./01,645; B.M.J.E. ii./03,68.

Salicinum (*Off.*), U.S. $C_6H_{11}O_5.O.C_6H_4.CH_2OH$ = 283·99 (286·144 I. Wts.)

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) in aqueous solution, taste may be covered with liquid extract of liquorice, or small dose in pill with glycerin of tragacanth.

A glucoside in colourless shining trimetric tabular crystals, without odour, taste moderately bitter. ***Soluble*** in 28 parts of cold water, 1 in 50 of alcohol, but not soluble in ether. Obtained commercially from *Salix fragilis* or *S. purpurea* and other species of willow bark. The peelings known as "rood schors" are worked up in Belgium and elsewhere. It is also produced from *Salix alba*, and from *Populus tremula*, the Aspen and other species of Populus. It is contained in the flower buds of Meadowsweet (*Spiræa ulmaria*).

Useful in psoriasis, internally in 15-grain doses.

Salicin is used in small doses, often combined with valerianates and compound rhubarb pill, as a mild tonic.

Effervescent Salicin.

Dose.—1 drachm. Contains 5 grains in 1 drachm.

Tablets, 5 grains of Salicin (0.32 Gm.). *Dose.*—1 to 4.

Acute rheumatism: large doses of Salicin are specific. It is not so depressing in its action as salicylic acid. It is not adapted for use as an external antiseptic. Is used for ague and all malarial fevers.

Ten grains of salicin in draught with carbonate of ammonium checks pyrexia of phthisis.—B.M.J. i./91,684.

Salicin is said to cure influenza more rapidly than any other treatment, and to act as a prophylactic.

In lupus erythematosus with good results, 15 grains 3 times a day with a saline aperient.—Brit. Jl. Dermatology, July, 1903.

Saligenin.

$C_6H_4.CH_2.OH.OH.$ (1:2) = 123·13 (124·064 I. Wts.)

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Manufactured by reducing salicyl aldehyde with sodium amalgam, and can be made by treating salicin with emulsive ferment.

Small white crystals soluble in water and alcohol. Has properties allied to salicin and salicylates.

Salol. Phenyl Salicylate (*Off.*). P.G. P. Austr.

$C_6H_4.OH.COO.C_6H_5$ = 212·47 (214·08 I. Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.) in cachets or suspended in milk.

Small crystals, with a slight wintergreen odour.

Tablets, 5 grains (0·32 Gm.). *Dose.*—1 to 3.

Capsules contain 5 and 10 grains (0·3 and 0·6 Gm.).

Soluble 1 in 10 of alcohol, 2 in 1 of ether, 1 in 12 of liquid paraffin, in fixed oils, and a trace in glycerin. Almost tasteless and insoluble in water.

Uses.—Is antiseptic and antipyretic; internally can be used advantageously in place of sodium salicylate, where this is badly tolerated. In the system it splits up into its component parts, both being found in the urine, which becomes very dark.

Salol has been given with success for rheumatism, acute and chronic, for sciatica, dysentery, and typhoid fever. Relieves earache and ocular neuralgia, and of value for summer diarrhœa, especially of children.

Salol with castor oil and tragacanth powder in a mixture should be dispensed by melting the salol and the oil in a warmed mortar (salol melts about 108° F.); emulsify with the tragacanth, using hot water to complete.—P.J. ii./05,386.

Salol Mouth Wash.

A preparation similar to Odol; is produced by dissolving Salol 2·5, Saccharin 0·004, Peppermint Oil 0·5, in Alcohol 80%, 97 by weight, and adding Clove and Caraway Oil.—Y.B.P. 1902,284.

Anise Mouth Wash.

Macerate 3 days Star Anise Fruits 15 in Alcohol 90% 200, filter and colour with Cochineal Tincture (is better than Alkannin) and add Peppermint Oil and Star Anise Oil, of each 60 drops. Pierre's Eau Dentifrice is similar. Eau de Botot is prepared with Cinchona, Cassia, Rhatany, Cloves, &c.—Y.B.P. 1902, 282.—See also Lysoform Mouth Wash, *p.* 108.

Emulsio Salol. *Dose.*—½ to 1 ounce.

Salol 20 grains, Compound Tragacanth Powder 20 grains, Distilled Water *q.s.* to 1 ounce.

Another formula: Mix Tincture of Tolu 50, and Water 500, and strain to free from separated resin. Triturate Salol 20, with Gum Arabic 20, and Tragacanth 1, add Syrup 150, and finally the Water and Tincture of Tolu in portions with stirring. ½ ounce contains 8 grains salol.

On account of slow excretion, should not be given in too large doses because of large content of phenol.

Carboluria caused.—B.M.J.ii./03,1590. Contra-indicated in renal disease.—Pr. xlv.12,99; M.C. Aug.93,342.

Renders urine aseptic, recommended for vesical catarrh, gonorrhœa, and operations on urinary organs.—L. i./90,644; Ed.M.J.1890,1080,387; Pr. xlviii.427.

Useful in pharyngitis and all forms of sore throat; relieves pain and difficulty of swallowing, and lowers temperature.—B.M.J. i./90,1040.

Intestinal antiseptic, very slightly irritating. A good form of administration is:—Salol, Bismuth Salicylate, Sodium Bicarbonate 5 grains each, in cachets.

Diabetes well treated with doses of 15 grains four times daily for 5 days.—P.J. ii./01,393.

Ulcerative colitis treated by 10 grain doses as antiseptic.—L. ii./04,1209.

Salol Varnish for Pills.

To act in intestines only. Salol 4, Tannin 1, Ether 20. Varnish several times until layer is sufficiently thick.—P.J. 1891,348. Or better as follows:—

Salol 2, Shellac 3, Absolute Alcohol and Ether, of each 3; forms a pill coating insoluble in the acid gastric juice, but soluble in the alkaline fluid of the intestine; suitable for purgatives to act on the bowels, and for administering antiseptic remedies in cases of eczema and urticaria, when these are caused by intoxication from ptomaines formed in the intestinal canal.

Collodium Salol, Salol Collodion. Salol 4, Ether 4, Collodion 30. Gives rapid relief in pain of acute rheumatism.—Th. Gaz. 1890,575; Pr. xlv.466.

Salol Catheter Oil. Salol 1, Castor Oil and Almond Oil, of each 15. Does not dissolve the varnish of catheters (G. Buckston Browne).

Salol cum Camphora, Salol Camphor.

Salol 3, Camphor 2, heated together combine to form a viscid liquid, which has been used as an antiseptic in place of iodoform.—P.J.1889,862,62. Salol Camphor, prepared with 10% only of camphor, quickly crystallizes, and when powdered is suitable for application, where liquid not available.—P.J. 1893,262.

Useful in suppuration of the middle ear; is neither painful nor irritating.

Unguentum Salol cum Cocaina.

Salol 2, Cocaine Hydrochloride 1, Ceratum Petrolei 16. Useful for burns.

Agathin. SALICYL-α-METHYL-PHENYL-HYDRAZONE.

Dose.—4 to 8 grains (0·26 to 0·52 Gm.) in cachets.

Whitish crystals insoluble in water, soluble 1 in 90 alcohol 90%. *Manufacture discontinued.*

Recommended as an anodyne in neuralgia, rheumatism, and sciatica, but is often unreliable in effect and slow in action.—B.M.J. i./93,702; ii./98,1054,1056.

Salophen. ACETYL-PARA-AMIDO-SALOL. P. Belg.

$C_6H_4\,OH.COO.C_6H_4NH.COCH_3 = 269{\cdot}11$ (271·144 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.) in cachets.

White crystalline scales, tasteless; soluble in alcohol, ether, and alkalis, almost insoluble in water. It contains 51% of salicylic acid. It is unaffected by gastric juice, but decomposed by pancreatic ferment. Anti-febrile and anti-rheumatic.—B.M.J.E.i./95,16. Also in chorea, sciatica and headache. Ointment 10% in lanolin for psoriasis and other skin affections. Used also for neuralgia and pleurodynia, in influenza and tonsillitis.

Salicylamide.

$C_6H_4.(OH)\,CONH_2 = 136{\cdot}07$ (137·096 I. Wts.).

Dose.—2 to 6 grains (0·13 to 0·4 Gm.), in cachets.

The amide of salicylic acid, produced by action of concentrated ammonia on gaultheria oil. Small white crystals; soluble 1 in 250 of water, readily in alcohol, chloroform, and ether. More soluble and prompt than salicylic acid; and has greater analgesic properties.

ACIDUM STEARICUM. U.S.

Stearinum, P. Austr. *Syn.* "STEARIN," wrongly so called. $C_{17}H_{35}COOH = 282{\cdot}14$ (*Off.* and U.S.Wts.); (284·288 I. Wts.).

This monobasic acid occurs as a hard white solid substance and is not entirely pure. It is prepared by decomposition with superheated steam of Stearin (the triglyceride of stearic acid contained with those of palmitic and oleic acids in tallow). ***Soluble*** about 1 in 18 of alcohol 90% Readily soluble in ether. Melts about 56° C. (132·8° F.). Is employed in making glycerin suppositories. — **P. Austr.** and those of **U.S.**—*Vide* Glycerin.

Cocoa Nut Stearin.—A white firm fat melting 84° F. (29° C.), suggested for use as suppository basis having a melting point somewhat lower than cacao utter, which (*Off.*) softens at 80° F. and (26·6° C.), and melts between 88° F. and 93° F. (31·1° and 33·9° C.).

ACIDUM SULPHURICUM.

$H_2SO_4 = 97{\cdot}34$ (98·076 I. Wts.).

ulphuric Acid (*Off.*).—*Syn.* OIL OF VITRIOL.

Dose.—1 to 2 minims (0·06 to 0·12 Cc.).

Has Sp. Gr. 1·843, and contains 98% by weight of ydrogen sulphate (U.S. contains 92·5%); is colourless nd almost odourless.—**Ph. Ned.**, 94 to 96%.

Preparation.—By passing SO_2 (made by burning ulphur) with a little nitric acid in leaden chambers nto which jets of steam are also sent.

This acid may be considered the key which unlocks the reasures of chemical science, as it opens the way to the roduction of the other mineral acids, is used in the first step f the Leblanc alkali process and the manufacture of bleaching owder, and through these, by endless ramifications, its action nd influence are extended to all manufactured chemicals. n 1900 contamination by arsenical impurity brought it nto evil repute in the production both of fo d and drugs. First, it caused Effervescent Sodium Phosphate to come under he ban of the Adulteration Acts, and then in 1902 the national beverage Beer met with a similar fate. The acid, nless it be made from sulphur, arsenic-free as formerly, s apt to contain arsenic at times in quantity as a dangerous mpurity, because it is now mostly made for commercial urposes from pyrites. If so, it is difficult to free it from all races of arsenic by purification, and through the refinement f chemical testing it is now hazardous to guarantee chemical ubstances absolutely free from arsenic. The limit of mpurity is difficult to fix, as traces of arsenic are found even n the materials of chemical apparatus and cooking utensils.

Report of Royal Commission on arsenical poisoning: ee B.M.J. ii./03,1557,1610; L. ii./03,1674, and *p.* 69.

Use. As caustic (*see* Michel's Paste) in cancer.

Antidotes.—Magnesia and *c.f.* Acidum hydrochloricum.

Sulphuric Acid "Arsenic-free" is specially prepared to stand the Marsh-Berzelius Test 1 hour.

Acidum Sulphuricum Aromaticum (*Off.*).

Syn. ELIXIR OF VITRIOL. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

Sulphuric Acid 3, Alcohol (90%) 29½, Spirit of Cinnamon ½, Tincture of Ginger 10.

This is a weak form of the old Mynsicht's Elixir Vitrioli—in this, ethyl-sulphuric acid is formed on keeping. The preparation would be improved by carefully heating the mixture of acid and alcohol to encourage the formation of the vinous acid. Contains 13·8% of hydrogen sulphate, and has Sp. Gr. 0·922 to 0·926.

U.S. has sulphuric acid (92·5%) 111, Tincture of Ginger (1 in 5 alcohol 94% by volume) 50, Oil of Cinnamon 1, Alcohol (94%) to 1,000 (=20% by weight H_2SO_4, was 18·5% 1890).

Estimation of (1) total sulphuric acid, (2) ethyl hydrogen sulphate, (3) free sulphuric acid, (4) ethyl sulphate.—P.J. ii./05,723.

Elixir Acidum. LIQUOR ACIDUS HALLERI, Ph.D.; F.Ital. *Dose.*—2 to 8 minims (0·12 to 0·48 Cc.).

Strong Sulphuric Acid and Alcohol, of each equal weights. Mix carefully and gradually.

P. Austr. has Liquor Acidus Halleri, **P.G.** Mixtura Sulphurica Acida, **F.E.** Aqua Rabeliana, and **P. Helv.** Mixtura Sulphurico-acida (Eau de Rabel) 1 to 3 of alcohol (weight); Codex, Acide Sulfurique Alcoolisé 100 to 300 (weight), and Red Poppy Petals 4; **Ph. Ned.** Sulfas Æthylicus Acidus cum Spiritu (equal weights); and T.H. 1881, Acidum Sulphuricum Alcoholisatum 15 to 105, aad Oil of Sage 1. In all these much of the sulphuric acid is in the form of ethyl-sulphuric acid (sulphovinic acid), which is more agreeable in taste than diluted sulphuric acid. If mixed with sweetened water, they form agreeable cooling drinks, useful in checking excessive perspiration.

Acidum Sulphuricum Dilutum. (*Off.*). Sp. Gr. 1·094. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

Contains 13·65%. (**U.S.** has 10%.) **P. Austr.** has Sp. Gr. 1·12=16·66%. **Ph. Ned.** is quadrinormal.

Add gradually sulphuric acid 4 to distilled water 40 (not *vice versa*), and when cool add more water to $48\frac{1}{2}$.

A useful digestive, intestinal astringent and addition to cough linctus or syrup.

Incompatible with alkalis, carbonates and precipitates calcium, and soluble lead and silver salts.

Acidum Sulphuricum Fumans. *Syn.* NORDHAUSEN SULPHURIC ACID.

Preparation.—By distilling dry ferrous sulphate.

p. Gr. about 1·9. Contains some sulphuric anhyride dissolved in sulphuric acid. Gives off white acid umes on exposure to the air, especially when warmed. s used as a caustic in cases of cancer, preferably as—

Michel's Paste. Asbestos, in powder, 1 ; Nordhausen Sulphuric Acid, 3. Mixed fresh.—L. ii./90,864.

Pasta Ricordi. Sulphuric Acid, Wood Charcoal to make a paste.

Fröhde's Reagent for alkaloids consists of a fresh solution of Sodium Molybdate 1, in pure strong Sulphuric Acid, 1,000. This gives various colour reactions, or absence of colour with different alkaloids.

The **Molybdates** of Sodium and Ammonium are employed in chemical testing. They are probably tolerated in small quantities in the system. Chemically, Molybdenum resembles Lead and also Uranium

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ACIDUM SULPHUROSUM (*Off.*).

$H_2SO_3 = 81·46$ (82·076 I. Wts.); $SO_2 = 63·58$ (64·06 I. Wts.).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

A colourless liquid, with strong sulphurous odour, and containing 5% of SO_2 (U.S. has 6%). Sp. Gr. 1·025.

Preparation.—By roasting sulphur or by heating copper and sulphuric acid, or carbon and sulphuric acid.

Sulphurous acid is a strong reducing agent. For example, many colours are bleached by the sulphurous acid combining with the oxygen of any water present, hydrogen being liberated, which latter forms colourless compounds with the colours. These compounds may then be removed by washing.

Uses.—Sulphurous acid, the solution is applied externally as a lotion—one part to two or more of water and sometimes a little glycerin added—for parasitic affections such as chloasma, ringworm, pruritus, thrush, and chapped hands, with very good results. It is sprayed into the throat for tonsillitis, diphtheria (better diluted) and asthma, or used as an inhalation, a teaspoonful to a pint of cold water. It is strongly antiseptic.

Recommended as a prophylactic to cholera, half-

drachm doses frequently, well diluted.—L. ii./93,289. And as a rectal injection, a 1 or 2% solution of the gas.

Internally, for gastric fermentation accompanied by sarcinæ it is given with success in its combinations.

In whooping cough fumigate the room with sulphurous acid.—Med. Record, July 22, 1905.

In typhoid 20 to 30 minim doses every two or three hours, given in an ounce of chloroform water with lemon syrup 15 minims.—B.M.J.ii./04,1450.

Room Disinfection.

To disinfect with sulphur dioxide, tins containing about 20 ounces condensed gas are supplied sufficient for 1,700 cubic feet. The lead exit pipe of the tin is cut off after previously sealing up all windows, &c., in the room, which should then be kept closed for eight hours.

It may be produced by igniting suphur (1 lb. to each 1,000 cubic feet) placed in a strong earthen vessel. The sulphur may be lit with a match after moistening with methylated spirit. Metals exposed in the room should be greased, and coloured materials be removed.

"Clayton Gas," consisting of the residual nitrogen of the air, a small quantity of unconsumed oxygen, sulphurous acid up to 15%, and a considerable amount of sulphuric acid (which is useful, as it renders the gas visibly opaque) has been employed for freeing ships' holds from vermin. A special Clayton apparatus is used.—L. ii./04,1735. Sulphur dioxide can be quite as powerful a germicide as Formalin. Not suitable for fumigating rooms of consumptives, but destroys vermin.

Liquozone contains sulphurous acid in dilute form.—L. i./05,1309. Two deaths from.—B.M.J. ii./05,53. For analysis.—P.J. ii./05,16.

Calcii Bisulphis. Is an antiseptic supplied in solution. Checks fermentation and putrefaction. Has been employed for preserving foods. **Calcium Sulphite,** $CaSO_3 = 119{\cdot}17$ (120·16 I. Wts.). A white powder, soluble in dilute Sulphurous Acid, has similar properties in less degree.

Magnesii Sulphis.

$MgSO_3 + 6H_2O = 210{\cdot}92$ (212·516 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

White crystalline powder. Soluble 1 in 90 in water. Valuable in diphtheria and other infectious diseases. Large doses may be given with impunity. **Tablets** 5 grains.

Sodii Hyposulphis.—*Syn.* SODIUM THIOSULPHATE (*Off.*). U.S. $Na_2S_2O_3 + 5H_2O = 246{\cdot}44$ (248·30 I. Wts.). *Dose.*—10 to 60 grains (0·65 to 4 Gm.).

Crystals soluble in water 1 in 1. Insoluble in alcohol.

Uses.—As a lotion, 1 in 10 for chloasma, ringworm, &c. It may be made to evolve sulphurous acid as, *e.g.*, in the following: Sodium Hyposulphite 6, Diluted Sulphuric Acid 1, Water 32.

To preserve the volumetric solution of Sodium Thiosulphate a few drops of carbon disulphide added are useful.

Useful in clearing out the intestinal tract and in lowering blood pressure (in arterio-sclerosis.)—B.M.J. i./06,126.

ACIDUM TANNICUM (*Off.*).

Syn. TANNIN. $C_{14}H_{10}O_9 2H_2O = 355{\cdot}42$ (358·112 I. Wts.). (U.S. *sine* Aqua 319·66 U.S. Wts.).

Formula is usually given without water of crystallisation. *Dose.*—2 to 5 grains (0·13 to 0·32 Gm.).

It is extracted from galls with ether containing a little alcohol and water. The yield is from 60 to 70%.—Ph.

Soluble in water 1 in 1 slowly, and in glycerin, less so in alcohol 90%, insoluble in ether.

Incompatible with ferric salts, acids, alkalis, silver and other metals and with gelatin, *c.f.* Honthin, &c., below. Furthermore, Tannin Solution precipitates the majority of alkaloids from solution, hence is occasionally employed as an antidote to these.

Uses.—Throat and mouth wash 1 to 2%. Astringent and styptic in powder form for epistaxis and internal hæmorrhage and in leucorrhœa and gonorrhœa.

Rectal injection of tannin 30 grains in a quart of hot water, with or without opium, in cholera. Also with boric acid in dysentery.—B.M.J.E. ii./90,1; ii./92,84.

Glycerinum Acidi Tannici, *v.p.* 367.

Glycerinum Aluminis et Acidi Tannici, *v.p.* 367.

In erysipelas, Tannin 1, Camphor 1, Ether 8, painted on the part, useful.—B.M.J.E. ii./92,31.

Acidi Tannici Glyceritum, P. Belg. Tannin 3, Glycerin of Starch 17.

Lotio Acidi Tannici Sulphurosa. (St. Bart.'s H.) Glycerin of Tannin 1, Sulphurous Acid 1, Water to 8.

Ovules with glycerin basis for use in vaginal discharges.—*v.p.* 527.

Pessus Acidi Tannici contain 10 grains each in theobroma oil basis, 120 grains weight.

Syrupus Iodo-Tannicus, *v.p.* 439.

Suppositoria Acidi Tannici (*Off.*).

3 grains with theobroma oil *q.s.* to 15 grains.

Suppositories of Tannic Acid with Opium contain 1 grain of opium in addition.

Suppositories of Tannic Acid with Belladonna, St. Bart.'s H., contain ½ grain Belladonna Extract.

Suppositories of Tannic Acid with Morphine W.H. contain Morphine Hydrochloride ½ grain.

Unguentum Acidi Tannici, U.S.

Tannic Acid 2, Glycerin 2, 'Ointment' (White Wax) 1, Benzoated Lard 4) 6.

Unguentum Acidi Tannici cum Opio, B.S.H.

Tannic Acid 30 grains, Opium 30 grains, Lard 1 ounce.

Wool, Tannic Acid, Absorbent.

T.H., 1881, 30%, 1 lb. rolls.

Honthin. *Dose.*—3 to 15 grains (0·2 to 1 Gm. up to 150 grains a day. An insoluble greenish brown compound of tannin and albumin, keratinised; is an intestinal astringent.—B.M.J.E., i./01,96.

Tannalbin. *Dose.*—8 to 15 grains (0·52 to 1 Gm.). **P. Austr., Ph. Ned..**

A compound of tannin with albumen, in pale brown insoluble, tasteless powder, containing about 50% of tannin. An intestinal disinfectant soluble in the intestines but unaffected by the stomach; recommended in diarrhœa. P.J. i./96, 342; B.M.J.E. ii./96,8; i./99,59.

Tannin Albuminate.

May be produced by adding white of egg diluted with water to 2 to 5 of tannin in 150 of water.

In nephritic conditions.—B.M.J.E. ii./04,4.

Tannigen. Di-acetyl-tannin. $C_{14}H_8(COCH_3)_2O_9$ = 403·06 (406·112 I. Wts.).

Dose.—3 to 8 grains (0·2 to 0·52 Gm.) in cachet.

A greyish white, tasteless, inodorous powder, insoluble in water, but rendered soluble by alkali. Recommended in chronic diarrhœa. Is not dissolved in the stomach, but only on reaching the intestine.—P.J. i.97,58.

This and tannalbin appear in the urine as gallic acid.

Tanocol. *Dose*—15 grains (1 Gm.).

A compound of tannin and gelatin. Used as an intestinal astringent.

annoform. $C_{29}H_{20}O_{18}=651{\cdot}23$ (656·16 I. Wts.).
A compound of tannin with formic aldehyde in reddish-
nite powder insoluble in water, soluble in alcohol and
kalis. Recommended as an unirritating antiseptic
ointment (1 in 10) or dusting powder alone or with
to 4 parts of starch, for bedsores, hyperidrosis,
uritus, eczema (particularly in interdigital eczema),
d piles. Useful in diarrhœa and enteritis, and for
nder feet.— P.J. ii./96,394: B.M.J.E. ii./96,47.
hecks the night sweats of phthisis if rubbed on the
est.—B.M.J.E. ii./01,59.

ACIDUM TARTARICUM.

$$\begin{array}{l} CH.OH.\ COOH \\ | \\ CH.OH.\ COOH \end{array} = 148{\cdot}92\ (150{\cdot}048\ \text{I. Wts.})$$

Dose.—5 to 15 grains (0·32 to 1·0 Gm.).

Manufactured from acid potassium tartrate
y heating with water and sufficient calcium carbonate to
most neutralise, converting thus into insoluble calcium
rtrate and soluble neutral potassium tartrate. The latter
also converted by aid of calcium chloride into calcium
rtrate. The two portions of calcium tartrate are
ashed and then decomposed with the necessary
uantity of sulphuric acid.

Soluble 10 in 8 water, 1 in 2½ alcohol 90%, 1 in
½ glycerin, 1 in 120 ether 0·720, 1 in 5 absolute
lcohol. Nearly insoluble in benzol and chloroform.

Incompatible with alkaline carbonates, potas-
ium, calcium, and mercury salts.

Uses.—For the production of effervescing tablets
see Neutralisation Table for equivalents) and as a
onstituent in the Granular Effervescent Preparations
any of which the late W. Martindale first manufactured.
s a constituent of Pilula Quininæ Sulphatis (*Off.*).

Estimation of Lead in Tartaric Acid.

Best English tartaric acid as a rule does not contain more
an 5 parts per million of lead and rarely exceeds 10.
oreign acids contain generally considerably more.

Cream of tartar and potassium citrate contain less than
parts per million. The same applies to citric acid. For
roportions of lead in other chemicals, *v.* C.D. i./05,388.

Prepare a standard lead nitrate solution in water 0·4 Gm.
n 250 Cc. This should be kept distinctly acid, and is diluted

100 times for use. 1 Cc. of this diluted solution contains 0·00001 Gm. Pb. 7 Gm. of tartaric acid are dissolved in 50 Cc. of water in a Nessler glass with internal diameter 2·5 Cm., and in another 2 Gm. of the same acid are dissolved in the same amount of water. To the first, ammonia is added in excess, and a few drops of a 10 per cent. potassium cyanide solution is added to prevent the iron and copper from interfering with the sodium sulphide solution, which is then added to the first Nessler glass.

The amount of lead solution added to the 'dummy' to match the colour of the solution of the sample on adding sulphide is the amount present in 5 or 10 Gm. of the sample as the case may be. One arrives, therefore, at the amount of lead present in parts per million; *e.g.*, 5 grammes of acid requiring 5 Cc. of diluted standard lead solution to balance coloration represent a content of 5 parts per million. Do not add lead solution after the sodium sulphide, this is a grave source of error.

To eliminate the inherent colour of the solution of the substance before adding the sulphide it may be necessary to add a minute quantity of burnt sugar to the 'dummy.'

If the sample be rich in lead, use correspondingly less of it, *e.g.* 2 Gm.

Method of Producing Lead-free Tartaric Acid.—Where the proportion of lead is excessive (*e.g.* 40 parts per million), pure lead-free acid for use as 'dummy' will be necessary. To prepare this 250 Gm. of the best acid obtainable are placed in a strong bottle fitted with rubber cork, and 1000 Cc. cold saturated hydrogen sulphide solution are added to nearly fill the bottle, which is (cautiously) then well shaken to dissolve the acid. Great internal pressure is produced owing to comparatively slight solubility of hydrogen sulphide in solutions of citric or tartaric acid. Allow to stand one day, filter, evaporate and crystallise. The solution on concentrating may become straw coloured, which can be removed by stirring into the hot solution a crystal of sodium chlorate. The first crop of crystals equal to half the acid taken will be absolutely lead-free.—C.D. March 15, 1905.

Pulvis Ærophorus, Ph. Ned.—Sodium Bicarbonate 3, Tartaric Acid 3, Sugar 4.

ACONITINA (*Off.*).

Syn. ACETYLBENZOYLACONINE. $C_{33}H_{45}NO_{12}$ = 642·53 (647·4 I. Wts.) (U.S. $C_{34}H_{47}NO_{11}$ = 640·55 U.S. Wts.)

The official formula is Dunstan's original one. Freund's formula is $C_{34}H_{47}NO_{11}$. (Schmidt & Schultze, at Marburg, have found $C_{34}H_{45}NO_{11}$.—C.D. ii./05, 584.) Dunstan now adopts the formula $C_{34}H_{47}NO_{11}$ (J.C.S.T. Oct. 1905, pp. 1654 to 1656) for Aconitine prepared on the Continent, and suggests that the sub-

stance from English roots is a different body. Dunstan now gives :—

Aconitine
$C_{34}H_{47}O_{11}N$ or $C_{21}H_{27}O_3N\begin{cases}O.CH_3CO\\[O.CH_3]_4\\O.C_6H_5CO\end{cases}$ = 640·56
(645·416 I. Wts.).
(Acetylbenzylaconine.)

Japaconitine
$C_{34}H_{49}O_{11}N$ or $C_{21}H_{29}O_3N\begin{cases}O.CH_3CO\\[O.CH_3]_4\\O.C_6H_5CO\end{cases}$ = 642·56
(647·432 I. Wts.).
(Acetylbenzylbenzaconine.)

Indaconitine
$C_{34}H_{47}O_{10}N$ or $C_{21}H_{27}O_2N\begin{cases}O.CH_3CO\\[O.CH_3]_4\\O.C_6H_5CO\end{cases}$ = 624·68
(629·416 I. Wts.)
(Acetylbenzylpseudaconine.)

Pseudaconitine
$C_{36}H_{51}O_{12}N$ or $C_{21}H_{27}O_2N\begin{cases}O.CH_3CO\\[O.CH_3]_4\\O.C_6H_3(OCH_3)_2CO\end{cases}$ = 684·26
(689·448 I. Wts.)
(Acetylveratrylpseudaconine.)

Bikhaconitine
$C_{35}H_{51}O_{11}N$ or $C_{21}H_{27}ON\begin{cases}O.CH_3CO\\[O.CH_3]_4\\O.C_6H_3(OCH_3)_2CO\end{cases}$ = 668·38
(673·448 I. Wts.)
(Acetylveratrylbikhaconine.)

Crystallised Aconitine.

Dose.—$\frac{1}{600}$ grain to $\frac{1}{250}$ grain (0·00011 to 0·00025 Gm.), and may be carefully increased if desired, the maximum single dose being 0·0003 Gm., the maximum daily dose 0·0006 Gm. — Van Renterghem in M. Index, 17, 1902.

The B.P. gives no dose, presumably on account of the extreme toxicity of this alkaloid. U.S. *average dose.*—$\frac{1}{400}$ grain.

An alkaloid obtained from *Aconitum napellus* root and dried leaves,—content about 0·03%. In colourless crystals. ***Soluble*** in dilute acids, alcohol (90% 1 in 40), and chloroform (1 in less·than 1), less readily soluble in ether, and almost insoluble in water and petroleum ether; melts at 189° to 190° C. (U.S.—heated rapidly melts at 195°, heated slowly at 182° C.); yields acetic acid at a slightly higher temperature, and in weak acetic solution yields a red crystalline precipitate with potassium permanganate.

U.S. tests for pseudaconitine and atropine by Vitali's test.—*q.v.*

A drop of a dilute solution placed on the tongue produces a characteristic tingling sensation.

For "Tuber" Aconiti that of the current year should be used as in B.P. Powdered drug to be used entire (*i.e.*, without separation of residue).—C.U.D.

Aconine and benzoylaconine (picraconitine or isoaconitine) have comparatively little action. Benzoylaconine is, to some extent, an antidote to the action of aconitine on the heart, but not on the respiration, whereas aconine possesses complete physiological antagonism to aconitine.—Proc. Royal Soc., lxii., 338; C.D. i./98,313.

Antidotes.—Calcium permanganate 5% solution is antagonistic.—J.C.S.A. i./05,107; *v.* also Aconite.

Uses.—More particularly employed externally (*vide* Unguentum Aconitinæ and Oleatum Aconitinæ) in neuralgia, avoiding mucous membranes, and raw skin.

Internally aconitine is a depressent, calmative, and diaphoretic.

It may be administered in the form of pill. It must be most carefully subdivided.

Pharmacology of the alkaloids of Aconite. Aconitine is about 200 times as toxic as benzoylaconine, and 2,000 times that of **Aconine.**—B.M.J. ii./98,1041.

Aconitine acts as mild diuretic. Is mainly excreted by the kidneys; after hypodermic use has been detected in the stomach.—Dixon.

Pyraconitine, $C_{31}H_{41}NO_{10}=582{\cdot}95$(587·368I,Wts.), consisting of aconitine minus one molecule of acetic acid, prepared by heating aconitine at its melting point, is almost non-toxic, but is more active than **Benzoylaconine** $C_{33}H_{43}NO_{11}=624{\cdot}65$ (629·384 I. Wts.), from which it differs by containing empirically one molecule less water. **Methylbenzoylaconine**, produced by heating aconitine with methyl alcohol, is feeble in toxicity in comparison with aconitine, but somewhat stronger than benzoylaconine —M. 1901, 39; L. ii./01,777; B.M.J.E. ii./01,28; B.M.J. ii./02,1243.

One part of aconitine corresponds in action to 0·5 parts of Pseudaconitine and 0·8 parts of Japaconitine.

Pseudaconitine $C_{21}H_{27}NO_2.OCH_3CO(OCH_3)_4.O[C_6H_3(OCH_3)_2CO]$, or $C_{36}H_{51}NO_{12}$, a crystalline alkaloid obtained from Indian (or Nepaul) aconite, *A. ferox*, melts at 201° C., and has the constitution of acetyl-veratryl-pseudaconine.

Indaconitine, or Acetyl-benzyl-pseudaconine—$C_{21}H_{27}NO_2.OCH_3CO(OCH_3)_4.OC_6H_5CO$, is from *Aconitum Chasmanthum*. **Bikhaconitine** (crystalline) $C_{21}H_{27}NO.OCH_3CO(OCH_3)_4.O[C_6H_3(OCH_3)_2CO]$ from *A. spicatum*.—L. ii./05, 1347.

Aconitine, Amorphous.

Dose.—$\frac{1}{6}$ to $\frac{1}{4}$ grain (0·01 to 0·016 Gm.).

Is a mixture of several bases, principally aconitine and picraconitine. It is about 20 times less toxic than the crystallised base.—M. 01,40.

Preparations.

Injectio Aconitinæ Hypodermica.

Aconitine (Crystals) 1 grain, Diluted Sulphuric Acid q.s., Distilled Water to $\frac{1}{2}$ ounce. Dilute one drop of the acid with about one drachm of water and carefully add drop by drop to the aconitine, avoiding excess, till it is dissolved, then make up the measure to half an ounce with water. *Dose.*—1 or 2 minims.

Aconitinæ Nitras. $C_{33}H_{45}NO_{12}HNO_3 = 705·11$ (710·448 I. Wts.). A crystalline stable salt.

Dose.—$\frac{1}{640}$ grain (0·0001 Gm.), hypodermically.

Oleatum Aconitinæ.

Aconitine 2, Oleic Acid 98. Dissolve; may be perfumed—is readily absorbed when painted on the skin for neuralgic affections.

Pilula Aconitinæ.

$\frac{1}{600}$ to $\frac{1}{250}$ Grain (0·00011 to 0·00025 Gm.).

Tablets of Aconitine Nitrate, Hypodermic.

$\frac{1}{640}$ Grain to be dissolved in warm water.

Unguentum Aconitinæ (*Off.*).

Aconitine 1, Oleic Acid (by weight) 8, (1 grain = 2 drops); heat gently to dissolve, and add Lard 41. Mix thoroughly. Should be freshly prepared. A piece the size of a bean is gently rubbed in for facial neuralgia, care being taken not to apply where the skin is broken, or to touch the mucous membranes.

ACONITI RADIX (*Off.*).

Root collected in the autumn from *Aconitum Napellus* (*Ranunculaceæ*), cultivated in Britain and dried. B.P. gives no dose or standard. P.G. *Dose* (max. single),

0·1 Gm.; daily max., 0·3 Gm. That of P. Belg. in powder dried at 100°C. contains 0·8% alkaloids. If more, dilute with milk sugar.

Use.—Anodyne, diaphoretic, diuretic.

Externally the liniment as such or mixed with chloroform or aconite liniment in neuralgia and rheumatism (causes tingling and numbness).

Internally the tincture diminishes the force and rate of the pulse, especially in the early stages of fevers and mild local inflammations such as feverish cold, laryngitis, and first stages of pneumonia, erysipelas and gonorrhœa. It also relieves the pain of neuralgia, pleurisy and aneurism. Large doses cause tingling of mouth and skin generally.

Aconite Root, U.S., contains at least 0·5% aconitine.

Average dose.—0·065 Gm. (1 grain).

Assay.—10 Gm. of the root in No. 40 powder are shaken with a mixture of 7 alcohol and 3 of water and percolated. The percolate is evaporated to dryness at a temperature not exceeding 60° C., the residue is treated with a sufficiency of $\frac{N}{10}$ H_2SO_4 and water. The alkaloidal solution is treated with ammonia and ether in repeated quantities. The ether washings are evaporated and dissolved in a measured volume of $\frac{N}{10}$ H_2SO_4 which is then back-titrated with $\frac{N}{50}$ KOH, using Hæmatoxylin as indicator. The factor 0·064 is given for determining the amount of aconitine present.

The structure of various aconite roots.—P.J. ii./01,576.

Assay of aconite herb, root and extract by various methods using Iodeosin* as indicator; also method of examining this compound for analytical purposes.—P.J. i./03,267.

Other Preparations of Aconite.

Chloroformum Aconiti, B.P.C.

Macerate Aconite Root bruised 20, with Strong Ammonia 1½, and Water 20, previously mixed, for 4 hours, dry and reduce to No. 40 powder. Macerate for 24 hours with Chloroform 20 in a percolator with tap, then percolate slowly, adding more Chloroform until 30 are obtained. Useful application for neuralgia; mixes with oils and liniments.

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*Note.—Iodeosin Test Solution, U.S. Tetra iodofluorescein $C_{20}H_8I_4O_5$, 0·1% in alcohol. Becomes colourless in acid solutions, pink in alkaline. Dilute the solution to be titrated with 100 Cc. or so of water, add 20 Cc. ether and 5 drops of the indicator and shake. Titration complete when pink persistent. For alkaloidal residues dissolve in known volume standard acid, todilute 100 Cc., and proceed as above.

Emplastrum Aconiti and **Emplastrum Aconiti et Belladonnæ** are prepared in sheets and rolls.

Extractum Aconiti (B.P. 1885). *Dose.*—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.) (from fresh leaves and flowering tops).

Extractum Aconiti Radicis Alcoholicum, Alcoholic Extract of Aconite Root (Fleming). *Dose.*—$\frac{1}{10}$ to $\frac{1}{3}$ grain (0·0065 to 0·02 Gm.).

Must be carefully distinguished from the preceding.

Fluidextractum Aconiti, U.S.

Average Dose.—0·05 Cc. (1 minim). Standardised to ·4 Gm. Aconitine in 100 Cc. Assay on lines of Aconite Root, *q.v.*

Linimentum Aconiti (*Off.*).

$1\frac{1}{2}$ = 1 of English root; useful in neuralgia.

May be produced 1 = 1 to contain all the alkaloids. —P.J. i./03, 458.

Death following 2-drachm dose of linimentum aconiti in a drunken adult.—B.M.J. ii./86,680. Fatal case of poisoning by 9 minims of same = about $\frac{1}{30}$ grain aconitine.—B.M.J. ii./91,994; M.C. Feb. 1892,319.

Aconite poisoning successfully treated by digitalis, 5 minims tincture hypodermically in course of 4 hours. —B.M.J.E. ii./92,56.

Linimentum Aconiti Compositum, G.H. A. B. C. Liniment.

Aconite Liniment, Belladonna Liniment, Chloroform Liniment, equal parts. To be well shaken before use, as the olive oil in the chloroform liniment is not soluble in the other ingredients.

Poisoning by A. B. C. Liniment.—B.M.J. i./96,399.

Pastillus Aconiti, *v.p.* 370.

Pilula Aconiti. Root, in powder, $\frac{1}{8}$ grain in each.

Dose.—1 hourly = about 2 minims of tincture.

Tinctura Aconiti (*Off.*).

1 of dried English root in 20 of 70% alcohol.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.). As a febrifuge 2 minims every 10 minutes or quarter of an hour, for an hour, then repeat dose every hour till skin acts well and temperature is reduced.

To be prepared by B.P. process and to be standardised

to 0·025% of total alkaloid by a method to be defined later by the C.U.D. This would not prove satisfactory. —B.M.J. i./03,29.

P.G. (1 in 10). Maximum single dose, 0·5 Gm. Daily dose, 1·5 Gm. U.S. has 1 in 10, assayed to 0·045% aconitine. **P. Belg.** contains 0·05% alkaloids.

Syrup, P. Belg., 1 of Tincture to Syrup 19.

Tablets are prepared each equivalent to 5 minims. To be directed to be dissolved in a little water.

Trochisci Aconiti contain each ½ minim of tincture. Given in fevers and mild inflammatory conditions.

Fleming's and **Turnbull's Tinctures** of **Aconite** are about twelve times the strength of the official. They are used externally, and were given in doses of 1 to 5 minims.

ADEPS.

Syn. ADEPS SUILLUS, AXUNGIA, **Ph. Ned.**

The purified fat of the hog, *Sus scrofa* (Linn.) contains 60% triolein, *v.p.* 642.

Adeps Induratus is for use in the tropics. The liquid constituent is removed to a great extent by pressure.

Soluble in ether 1 in 22, and in oil of turpentine 1 in 16 (almost completely).

Adeps Benzoatus (*Off.*). **Ph. Ned.** 2%.

Benzoin 3, Lard 100, heat 2 hours on a water bath and strain. The benzoic acid remaining in solution promotes healing and exercises antiseptic action, as well as preserving the preparation.

To be avoided as a basis for eye ointments.

Improvement on B.P. method of making by ether-castor oil solvent:—Macerate Benzoin 20 Gm in ether 40 mils, 12 hours. Filter and solve Castor Oil 10 Gm. in same. Distil off ether and add castor oil to produce 15 Gm. Use proportiona amount of this solution.—P.J. i./05,470.

ADEPS LANÆ.

Wool Fat (*Off.*). **P.G.iv. U.S. P. Austr. Ph. Ned.** ANHYDROUS LANOLIN.

The purified cholesterin fat of sheep's wool. A yellowish, tenacious, unctuous substance, almost inodorous, melting from 104° F. to 112° F. Sheep's wool yields from 10 to 30%. It is removed by treatment with water.

Soluble 1 in 25 ether, 1 in 18 oil of turpentine (both with some residual matter), almost insoluble in alcohol 90% .—Analysis, C.D. i./03,720.

Adeps Lanæ Hydrosus. **Hydrous Wool Fat** (*Off.*). Commonly known as 'Lanolin.' Wool Fat 7, Distilled Water 3. Melt and mix. **P.G.** **P. Austr.** "Lanolinum" **Ph. Ned.** (with 75% of fat). **U.S.** not more than 30% water.

Yellowish white, free from rancid odour. If heated the watery portion separates from an upper oily layer. More water, up to about equal weights of fat and water, may be incorporated with it without affecting its consistence. Soluble partly in alcohol, while ether and chloroform dissolve only the fats it contains.

Originating from keratinous tissue, Wool Fat has affinity for, and is readily absorbed by, the skin. It causes no irritation, and is useful in massage. It helps absorption of narcotic extracts, quinine, iodine, potassium iodide, and chaulmoogra oil. Iodine appears in the urine in three minutes after friction. Washing the skin with ether facilitates its absorption. It is more readily absorbed in children than in adults. It is contained in conium and in hamamelis ointment. Useful combined with chrysarobin in psoriasis, ringworm, and tinea favosa, and with salicylic acid for eczema; or with mercury, as in :—

Lanolinum Hydrargyri.

Mercury 100, Lanolin 200, Mercurial Ointment 5, Mutton Suet 50. Is specially useful for inunction in syphilis. The effect is much more rapid than that of Mercurial Ointment; should be used daily 4 to 8 times after a hot bath.—M.P.C. ii./86,327; L. i./93,925.

See also **Mercurial Injections.**

Unguentum Hydrargyri, P. Austr.

Mercury 30, Anhydrous Wool Fat 15, mix *s.a.*, and add, melted and cooled, Suet 18 with Lard 37.

Sapolanoline. Lanolin 5, Soft Soap 4.

Recommended for acne and eczema.

Unguentum Adipis Lanæ, P.G. iv.—Wool Fat 20, Water 5, Olive Oil 5.

Unguentum Lanolini, Lanolin Ointment.

Lanolin (hydrated) 2, Soft Paraffin or Vaseline 1.

Mix. May be perfumed to form **Lanolin Cream.** These are much less sticky than Lanolin.

Equal parts of lanolin, lard and soft paraffin melted together form a useful ointment basis.—P.J. i./01,694.

Wool Fat 9, with Almond Oil 1, is a good basis.

Unguentum Leniens, Ph. Ned.

Wool Fat 10, Yellow Wax 5, Spermaceti 10, Sesame Oil 50, Rose Water 25. A creamy consistence.

Cholesterin ($C_{27}H_{45}OH+H_2O$ (Schmidt) = 401·33 (404·384 I. Wts.) is prepared from wool fat by saponifying the same with potash, and extracting the cholesterin with ether.

ÆTHER (*Off.*).

$O<^{C_2H_5}_{C_2H_5}$ = 73·52 (74·08 I. Wts.).

Syn. ÆTHER SULPHURICUS; ETHYL OXIDE.

Dose.—40 to 60 minims (2·4 to 3·5 Cc.), or 10 to 30 minims (0·6 to 1·8 Cc.) repeated.

Manufactured by the distillation of Sulphuric Acid and Alcohol—Ethyl Hydrogen Sulphate being first formed which reacts with a further quantity of Alcohol liberating Æther and Sulphuric Acid again; in this manner the Acid will react with a very considerable quantity of Alcohol.

Soluble 1 in 10 of water, and the ether similarly dissolves about the same amount of water. Is miscible in all proportions with alcohol. Ether is a solvent for a number of alkaloids, fats, resins, and of mercuric perchloride and biniodide, also of bromine and iodine.

Uses.—Internally; a rapid stimulant in syncope. Is carminative. May relieve dyspepsia and asthma. Externally, was much used to produce local anæsthesia, by means of evaporation, freezing the part. Hypodermically it saves many lives threatened by syncope, collapse, and shock from hæmorrhage and injury. *See* **Glass Capsules**, *p.* 83.

For general anæsthesia ether produces less depression on the heart than chloroform, but its use is unpleasant both to the patient and to the operators. Its suffocating action on the patient, if suffering from any lung or bronchial affection, is very irritating, and has proved fatal. Care must be taken not to employ it near a light;

s vapour is 2½ times heavier than air and very inflam-
able, and as an anæsthetic it has to be used freely.

If dangerous symptoms arise during adminis-
ration of ether, proceed as for ethyl chloride, *v p.* 89.

During ether narcosis the volume of urine secreted is ffected in same way as with chloroform *q.v.* The output of itrogen falls, the escape of leucocytes into the urine after ll ether narcosis is more marked than with chloroform. here is increased excretion of chlorides, much less and of horter duration than with chloroform. Temporary albuminuria ppeared in larger proportion of experiments with ether than ith chloroform. Reducing substances other than glucose ppeared in some cases. Experiments on dogs.—B.M.J. 06,667.

Revelations during anæsthesia.—L. ii./81,9.

Report on Ether drinking.—B.M.J. ii./90,885.

Death during ether anæsthesia.—L. i./00,45; Pr. ii.367; B.M.J i./01,574.

Ether anæsthesia much safer than chloroform, as ½ to 1.—M.C. Dec.1892,150. Its comparative safety oubted.—L. i./02,1457.

Administration of nitrous oxide preceding ether recom-ended.—B.M.J. ii./92,938. Death under this treat-ent.—L. i./96,179; i./97,1039.

Pneumonia may follow its inhalation.—L. i./98,858.

Ether recommended as a menstruum and vehicle for kin medication, on account of solvent action on seba-ous secretion. *See* Ethereal Tinctures of Belladonna *p.* 174), Capsicum (*p.*215), Iodine (*p.*440), and Menthol *p.* 476). — L. i./90,1066; ii./90,67; i./93,997; P.J. 890,84; Pr. xlv.218; Th. Gaz. 1890,554.

Ether and chloroform used commercially to force lants and flowers to bloom earlier and more profusely.—B.M.J. i./06,326.

Glass Capsules contain half a drachm in each for ypodermic injection as a dose in heart failure — are onvenient to carry in the emergency bag. These are ade with 0·735 ether — ethers with lower boiling oints are unsuited.

Hypodermically 20 to 60 minims have proved a suc-essful restorative in typhoid fever and for dyspnœa.

Commercial Varieties in General Use.

(1) *From pure Alcohol.*

Ether (*Off.*) Sp. Gr. 0·735.

This, the ordinary medicinal ether, contains not less

than 92%, by volume, of ethyl oxide; the remainder is alcohol and water. Boiling point not higher than 105°F. (40·5°C.). It is sometimes inhaled for producing general anæsthesia, but is not so suitable for this purpose as

Æther Purificatus (*Off.*). 'Aether,' Ph. Ned. Sp. Gr. not exceeding 0·722 and not below 0·720.

Should assume no blue colour on standing, when mixed with half its volume of solution of potassium bichromate acidulated with sulphuric acid, showing absence of hydrogen peroxide; nor should it be coloured by potassium hydroxide, showing absence of aldehyde. On evaporation leaves no residue or abnormal odour.

Æther pro Narcosi, P.G.iv. Æther ad Narcosin, Ph. Ned., Sp. Gr. 0·720.

Must be kept from light, in full bottles, and stand more rigid tests than Æther P.G. P. Austr. directs to keep in 150 Cc. bottles.

(2) *From Methylated Alcohol.*

Absolute Ether, Methylated, Sp. Gr. 0·717 to 0.719.

Contains a little methylic ether, and is specially adapted for spraying to produce local anæsthesia, as it boils under 80° F., and is free from water. It is not adapted for producing general anæsthesia.

Rectified Ether, from Methylated Alcohol, Sp. Gr. 0·720. For General Anæsthesia.

Ether, well washed to free it from methylic ether, purified and re-distilled. It is well adapted for producing general anæsthesia, if standing the tests given for purified ether.

Methylated Ether, Sp. Gr. 0·730.

Is adapted for common purposes, ice machines, &c. Not fit for medical use. For photography a purer preparation, Sp. Gr. 0·725, is used.

Preparations.

Perles of Ether, 3 minims in each. *Dose.*—1 to 4.

Perles of Ether and Turpentine. *Dose.*—1 to 4.

Useful to relieve pain of gallstones, gravel and colic.

Spiritus Ætheris (*Off.*).

Ether, Sp. Gr. 0·735, 1, Alcohol (90%) 2.

U.S. has Ether 325, Alcohol (94·9% by vol.) 675.

Dose.—60 to 90 minims (3·5 to 5·3 Cc.), or 20 to 40 minims (1·2 to 2·4 Cc.) repeated.

The older formula is often ordered, viz.:—

Spiritus Ætheris Compositus (*Off.*).

Syn.—HOFFMANN'S ANODYNE, but the simple Spirit of Ether is now called Hoffmann's Anodyne in Continental Pharmacopœias.

Dose.—60 to 90 minims (3·5 to 5·3 Cc.), or 20 to 30 minims (1·2 to 2·4 Cc.) repeated.

Mix gradually Sulphuric Acid 36 with Alcohol (90%) 30; after 24 hours distil until the liquid in the retort reaches a temperature of 341° F. Pour the distillate into a separator, and, having removed the lower layer, add to the remaining upper layer Distilled Water 1½, and Sodium Bicarbonate *q.s.* to nearly neutralize. Separate the ethereal liquid (Oil of Wine), add it to Ether 5½ and Alcohol (90%) 38, and filter. **Ph. Ned.** uses Ether and Alcohol 90% equal parts (by weight).

Spiritus Ætheris Compositus, U.S., has Ether 325, Alcohol (94·9% vol.) 650, Ethereal Oil 25.

Oleum Æthereum, U.S.

Ethereal oil is an ethereal solution of the product of distillation of alcohol and sulphuric acid.

Mistura Ætheris cum Ammonia.

Spirit of Ether 3, Aromatic Spirit of Ammonia 3, Water to 48. A rapid stimulant.

Gt. Orm. H. has Spirit of Ether 3½ minims, Aromatic Spirit of Ammonia 3½ minims, Tincture of Orange Peel 2 minims, Camphor Water to 1 drachm, for a child one year old.

Mistura Ammoniæ cum Æthere, U.C.H., has Aromatic Spirit of Ammonia 15, Spirit of Ether 15, Camphor Water to 480. The dose of either of these preparations is one ounce. **St. M.'s H.** has Sal Volatile ½ drachm, Spirit of Ether ½ drachm, Chloroform Water to 1 ounce.

Spiritus Ætheris Nitrosi (*Off.*).

Dose.— 60 to 90 minims (3·5 to 5·3 Cc.), or 20 to 40 minims (1·2 to 2·4 Cc.) repeated.

An alcoholic solution of ethereal compounds containing ethyl nitrite (not less than 1·75%), aldehyde, and other substances, probably including paraldehyde.

Uses. — Antipyretic, diaphoretic, diuretic, and stimulant. Relieves the spasm and pain of asthma, dysmenorrhœa, angina pectoris; also the pain of the passage of renal calculi and gall stones.

U. S. requires 4% ethyl nitrite.

Incompatibility and Test.—5 Cc. of this solution treated with 5 Cc. of Potassium Iodide Solution (*Off.*), and 5 Cc. of dilute Sulphuric Acid yield at least 31¼, but not more than 35 Cc. of Nitric Oxide, corresponding to at least 2½% by weight of Ethyl Nitrite, Iodine being liberated. Potassium Iodide should, therefore, obviously not be prescribed with Spiritus Ætheris Nitrosi. Furthermore, green Iso-nitroso-antipyrine is formed with Antipyrine (neutralise first with alkaline carbonate or bicarbonate in dispensing); Spiritus Ætheris Nitrosi is also incompatible with Salicylates and Ferrous Sulphate.

Ammonium Acetate or Citrate hinders the deterioration of Spirit of Nitrous Ether.—D. J. Leech.

Liquor Ethyl Nitritis, Solution of Ethyl Nitrite (*Off.*). *Dose.*—20 to 60 minims (1·2 to 3·5 Cc.). Should be directed to be added to a small quantity of water at the time of taking.

A mixture of Absolute Alcohol 95 and Glycerin 5, containing in 100 parts by volume, 3 parts, or not less than 2½ parts by weight of Ethyl Nitrite (obtained by the interaction of alcohol, sodium nitrite, and diluted sulphuric acid, at a low temperature). Should be stored in small bottles.

The circulation is distinctly affected by a fraction of a minim, yet large quantities do not cause death, *vide* also Nitroglycerin, and Sodium Nitrite—Leech.

Æther Aceticus. Acetic Ether. (*Off.*).—Consists principally of ETHYL ACETATE. $CH_3.COO\,C_2H_5$ = 87·4 (88·064 I. Wts.) Ph. Ned.

Dose.—60 to 90 minims (3·5 to 5·3 Cc.) or 20 to 40 minims (1·2 to 2·4 Cc.) repeated. Sp. Gr. 0·900 to 0·905. Boils between 165° and 172°F (73·9° and 77·8°C). Is used in preparing Liquor Epispasticus, and inhaled for laryngeal catarrh, ½ drachm to the pint.

Soluble in all strengths in alcohol and ether, and about 1 in 90 of water.

ÆTHYL BROMIDUM.

C_2H_5 Br = 108·17 (109·0 I. Wts.).

Ethyl Bromide.—*Syn.* HYDROBROMIC ETHER.

Is prepared by distilling a mixture of alcohol, bromine, and phosphorus. It is a colourless, very volatile liquid with a strong peculiar odour and a sweetish warm taste. It has Sp. Gr. 1·445 to 1·450, boils at 38·8° C. (Schmidt). ***Soluble*** 1 in 85 of water and miscible with alcohol 90%, and ether in all proportions. It should be free from Bromine, Sulphur Compounds (giving yellowish colour), free Hydrobromic Acid, Ethyl and Amyl compounds (test with Sulphuric Acid—yellow if present), and Phosphoretted Hydrogen (garlic odour).

Is recommended as a safe and convenient anæsthetic for short operations (particularly minor nose and throat operations). In suitable dose—for children under three years, 1½ drachms; between three and twelve years, 2 to 2½ drachms; young adults, 2½ to 3½ drachms, on a piece of lint held over nose and throat. The patient is entirely normal on coming round, therefore suitable where chloroform is not considered necessary, and where the action of Nitrous Oxide is not prolonged sufficiently. Does not require any special apparatus.—B.M.J. ii./02,589; L. ii./03,746.

Somnoform (*v.p.* 91) contains 5% of Ethyl Bromide.

Ethyl Bromide Capsules.

Encased in cotton wool and silk, contain 5 minims in each; are convenient for use when fractured. Useful in asthma and epileptic convulsions.

For local anæsthesia, recommended as spray or simply short covered contact, not necessary to freeze the part, all feeling ceases. Is of great service to dentists.—L. i./82,212; i./89, 848,900; ii./90,414.

Ethyleni Bromidum. Ethylene Bromide.

$C_2H_4Br_2$ = 186·52 (187·952 I. Wts.)

Must be distinguished from the above.

Dose.—1 to 2 minims (0·06 to 0·12 Cc.) in alcoholic solution added to milk, or oily solution

hypodermically or in **Gelatin Capsules** containing 1 minim.

A colourless liquid, of Sp. Gr. 2·163, crystallizing below 48°F., and containing 90·9% of bromine. Taste sweet afterwards burning. Soluble 1 in 4 of 90% alcohol, miscible in all proportions with absolute alcohol and oils, insoluble in water.

Has been found useful in epilepsy, mostly of long standing; reduces frequency and intensity of attacks. Only in large doses caused nausea.—Th. Gaz. 1891,540; P.J. 1891,1068; B.M.J. i./92,102.

ÆTHYL CHLORIDUM.

Æthylis Chloridum, U.S.; Æthylum Chloratum, P. Austr.; Chloretum Æthylicum, Ph. Ned.

$C_2H_5Cl = 64·01$ (64·49 I. Wts.) (64·00 U.S. Wts.).

Syn. Hydrochloric Ether, Chloryl Anæsthetic.

Dose.—A good average for an adult by inhaler is 5 Cc.—L. ii./04 1704.

Manufactured by the action of hydrochloric acid on absolute ethyl alcohol.

At ordinary temperatures this is gaseous, but condenses into a colourless mobile liquid with a sweetish burning taste. Slightly soluble in water, readily in alcohol. Sp. Gr. 0·9214. On account of its low boiling point (about 50° F.) and the intense cold produced by evaporation, it is useful for producing local anæsthesia in minor surgical operations, such as removal of ingrowing nails, opening of abscesses, and tooth extraction; also for allaying the pain of neuralgia. All fat must be removed from the part by washing with soap and then with alcohol or ether before applying. In dental cases the patient is instructed to breathe through the nose during operation, the part is well dried, and other parts protected. Its vapour is inflammable.

If **Suppository Moulds** be wiped out with ethyl chloride before pouring in the melted mass the "setting" will be assisted.

For inducing **general anæsthesia**, ethyl chloride is described as pleasant in action, does not cause cyanosis,

is taken readily by children and adults, the effects pass off rapidly, and there are few or no after effects. No preliminary preparation of the patient is necessary as in the case of chloroform or ether. Probably within the limits for which it is intended it is safer than any other anæsthetic excepting nitrous oxide. A new inhaler is described.—B.M.J. ii./04,67.

It is also said that it may be given in any position acts more quickly, causes less struggling and fewer unpleasant after effects than Chloroform, does not cause the suffocating symptoms of Nitrous Oxide, requires no complicated apparatus, and the anæsthesia produced lasts much longer. It is more pleasant than ether and quicker in action, and produces no unpleasant taste in the mouth nor smell in the room.

Ethyl Chloride (and Ethyl Bromide) are said to be heart stimulants not depressents, as Chloroform is.

Glass Tubes contain 30 grammes, terminating in a fine tube, with spring-capped point, which is directed to the required part, when the chloride is volatilized by the warmth of the hand. It should be held 6 to 10 inches from the part to be anæsthetised.—B.M.J. i./92, 535; ii./92,1395; B.M.J.E. i./92,79; i./93,55.

These are supplied (1) with fine point for *local* anæsthesia. (2) With coarser spray for *general* anæsthesia, and the tube is graduated.

Ethyl Chloride is also supplied medicated **with Carbolic Acid 2 per cent.**, useful for throat work, **Cocaine Hydrochloride** (saturated solution), for dental work; **Iodoform** (saturated solution) useful in septic conditions of the throat and for septic cavities, denuded surfaces, burns and scalds, inflamed vaccinated arms.—L. i./03,1747. **Metal Cylinders** are also supplied with screw cap containing 50, 100, and 150 Gm. These may be recharged. **Glass Capsules** contain 3 and 5 Cc.

Instructions for treatment if dangerous symptoms arise in the administration of—

Ethyl Chloride, or Somnoform or Ether.—See that the airway is clear and the clothing loose, and begin artificial respiration at once. Weak ammonia vapour

may be held to the nostrils. Hot flannels should be placed over the heart and the face, and chest smacked with a towel wetted in cold water. Artificial respiration must be kept up for at least an hour, and meanwhile Faradism may be tried. The patient must be kept warm.—R.D.H.

In case of **overdose of Ethyl Chloride**. Examination of the blood of patients, and of cats killed by, showed absorption bands resembling those of carbon monoxide.—Fleming, Bristol, Med. Jl., Sept. 1905.231.

The **combined use of Ethyl Chloride and Nitrous Oxide** has been advocated for dental extractions.—Brit. Dent. Jl.1903,615.

Ethyl chloride applied to nape of neck for hysterical aphonia.—L. i./96, 161; P.J. i./96,139.

Recommended as a general anæsthetic for short operations.—L. ii/01,123; B.M.J. ii./03,867; L. i./03,952; i./04,103; L. ii./03,1531; L. ii./04,1408,1410,1702; L. ii./05,1176. Ten cases of narcosis in dentistry successful.—L. i./01,698.

Carter Braine's modification of Ormsby's inhaler, and full discourse on ethyl chloride.—L. ii./04,1703.

Ethyl chloride should not be used in dentistry where nitrous oxide would do.—L. ii./05,1359; B.M.J. i./06,83.

Its value as a general anæsthetic lies between nitrous oxide and ether.—L. ii./05,1023; L. i./06,96. This and other anæsthetics discussed.—B.M.J. i./06,618.

Lupus treated by freezing with.—B.M.J. i./01,76.

On a new mode of use with Clover's inhaler.—B.M.J.i./04,604.

It should not be administered to alcoholics—B.M.J.E. ii./04,64.

A death while under ethyl chloride.—B.M.J.ii/05,73; B.M.J. i./06,616. 22 fatalities (8 dental) which have occurred.—L. i./06,1233. Comments on deaths.—L. i./06,1497.

Kelene, a fancy name for Ethyl Chloride.

Is supplied in 60 Gm. glass tubes with automatic spray and stopper for local anæsthesia and general narcosis (graduated), and requires a special mask.

For nasal surgery.—B.M.J. ii./01,896.

Anestile.

A mixture of ethyl chloride and methyl chloride, which does not harden the skin like the latter, and on

account of its evaporating at a lower temperature than the former is quicker and more extended in action. It is sold in screw-capped cylinders of various sizes.

Somnoform is said to be a mixture of Ethyl Chloride 60%, Methyl Chloride 35%, and Ethyl Bromide 5%. The liquid is supplied in 60 Gm. glass tubes with a special "valve stopper" for inhalation as an anæsthetic in dentistry. One-tenth part of the contents of a tube is to be used for an inhalation with as little access of air as possible. A special mask termed "The Ideal" is supplied. Another form of inhaler for. — L. i/03, 1677; ii./03,323, 496,631; i./04,103; ii./04,1408.

If **dangerous symptoms** arise in administering proceed as directed, page 89, 90.

In using, respiration must be watched carefully. There is no danger of heart failure providing respiration has not ceased.—B.M.J. i./03,1421. (Note the proportions there given are incorrect.) Recent experience.—L. ii./04,1408,1486.

Glass Capsules contain 3 and 5 Cc.

Narcotile.—The so-called Bichloride of Methyl-Ethylene. Is said to be prepared by the action of Hydrochloric Acid on mixed Ethyl and Methyl Alcohols distilled together. Has an agreeable odour, and is inflammable like Ether. Is supplied in 50 Cc. tubes. The general anæsthesia produced was found satisfactory. Results of 26 cases.—L. i./03,1091.

ÆTHYL IODIDUM.

Ethyl Iodide.—*Syn.* HYDRIODIC ETHER.
$C_2H_5I = 154{\cdot}72$ (156·01 I. Wts).

May be obtained by distilling a mixture of alcohol, iodine, and phosphorus. A colourless liquid (but liable to become coloured by setting free iodine). Of a penetrating odour; boils at 148° F., has Sp. Gr. 1·94; is not inflammable. When dropped on red-hot charcoal, it gives off an iodine vapour. ***Soluble*** 1 in 400 of water, and miscible with alcohol and ether in all proportions.

It is useful inhaled as an anæsthetic to relieve the dyspnœa of bronchitic asthma and œdematous laryngitis. As it contains four-fifths of its weight of iodine, it

forms a rapid means of saturating the system with this element; it neither impairs appetite nor weakens digestion. General iodization may be produced by painting the iodide on the calf of the leg or between the shoulders, and covering by impermeable dressing.

It is useful for inhalation in œdema of the glottis from catarrhal laryngitis. It acts as an antispasmodic in spasmodic asthma and certain forms of nervous dyspnœa: iodine can be detected in the urine 10 minutes after inhalation, and as long as 30 hours after.

Useful in bronchial catarrh; induces sleep and promotes expectoration when inhaled.—B.M.J.ii./89,1216.

Ethyl Iodide Capsules.

Encased in cotton wool and silk, containing 5 minims in each. The glass capsule is snapped, the fluid absorbed by the wool, &c., and inhaled for four or five minutes. This may be repeated 3 or 4 times a day. The patient requires no assistance, and can take one of the capsules from the bedside, in the dark if necessary.

Ethyl Iodide and Chloroform Capsules contain 5 minims of Ethyl Iodide and 10 minims of Chloroform, and are of the greatest service in the relief of asthma and whooping-cough.

Methyl Iodide. $CH_3I = 139{\cdot}81$ (141·994 I. Wts.).

A colourless liquid (when first made) boiling at 44° C. Sp. Gr. 2·285. As a vesicant is even more powerful than cantharides.

Blisters appear in a few hours after rubbing in 15 to 20 drops, according to area to be blistered.—L. i./06,923.

ALCOHOL.

$C_2H_5OH = 45{\cdot}7$ (46 048 I. Wts.).

Alcohol Absolutum (*Off.*). U.S. Ph. Ned.

Syn. Ethylic Alcohol, B.P. 1885.

Ethyl hydroxide, with not more than 1% by weight of water. Sp. Gr. 0·794 to 0·7969 representing 99·95 to 99·4% by volume.

In B.P. 1885 this had Sp. Gr. 0·797 to 0·800, and therefore contained 1 to 2% of water; the purest Alcohol obtained by Squibb had Sp. Gr. 0·7935 at 60° F.—"Ephemeris," ii.562.

Alcohol Absolutus, P.G. iv., Sp. Gr. 0·796 to 0·800. **P. Austr.**, Sp. Gr. the same = 99·4 to 99·7%.

Absolute alcohol applied to herpes zoster relieves the pain.—B.M.J.E. ii./01,12.

Alcoholic drinks do not kill typhoid germs in man's stomach or intestines.—B.M.J. i./03, 352.

Facial neuralgia cured by injections of alcohol down to the affected nerve (sometimes with cocaine $\frac{1}{6}$ grain).—L. i./06,1605.

Lancet report on Cognac brandy.—L. ii./03, 1503.

For dietetic use the alcohol from grapes is purest; from corn is next best; from beetroot may be impure; and from potato the most dangerous.—W.W.W.

Immature spirits and liquors may contain furfuraldehyde which has been shown to be objectionable. Even liquors made from fruit juices may contain as much as 1 or 2% of methyl alcohol.

Acute forms of inflammation of the womb and ovaries and general inflammatory conditions of the female genital organs have been well treated by abdominal compresses, first of alcohol 60% strength, and afterwards with 90% together with vaginal tampons 30% strength.—M.A.04,5.

Alcohol, untaxed.—Millard, P.J. ii./04,660.

Non-Inflammable Alcohol may be made by adding carbon tetrachloride 40% by volume.

In brewing beer "top" fermentation is employed in this country as distinct from the "low" fermentation on the Continent.

Alcohol (90 per cent.), Spiritus Rectificatus.

Syn. RECTIFIED SPIRIT (*Off.*). SPIRITUS VINI, **P. Austr.** 'SPIRITUS,' **Ph. Ned.**

Contains 90% by volume, or 85·65% by weight, of Ethyl Hydroxide. Sp. Gr. 0·8340 (Squibb). Strength 57·80° O.P. (*i.e.*, 100 volumes contain the same quantity approximately of Ethyl Hydroxide as 157·8 volumes of proof spirit). It is slightly stronger (1·35% by volume) than Spiritus Rectificatus, B.P. 1885, which contained 84% by weight (=88·65% by volume) of Ethyl Hydroxide and had Sp. Gr. 0·838; 55·85° O.P. It is generally manufactured commercially of higher alcoholic strength, *i.e.*, about 70° O.P., Sp. Gr. 0·809, containing nearly 95% by weight of Ethyl Hydroxide, and is diluted as required. '**Alcohol,**' **U.S.**, has Sp. Gr. 0·816 at 15·6° C (0·809

at 25°C), and contains **94·9%** by volume (92·3% by weight) of Ethyl Hydroxide.

The Inland Revenue has removed the restriction on the manufacture of alcohol for industrial purposes from sawdust. Glucose is formed as an intermediate product, and this is dutiable; but now the process is treated as a continuous one, and can be carried on at a profit.—C.D. ii./oo, 872.

Diluted Alcohol (*Off.*). *Syn.* **Alcohol Dilutum.**

Including Alcohol (90%)—see above—there are official five strengths, or "several degrees of dilution," of Ethylic Alcohol, four of which are directed to be prepared from the Alcohol (90%), and contain respectively 70, 60, 45, and 20% by volume of Ethyl Hydroxide. On the next page a Table is given, founded on B.P. and Gilpin's Tables, showing:—

(i.) The volume of Distilled Water necessary to be added to 100 volumes of Alcohol (90%) for the production of each strength of Diluted Alcohol.

(ii.) The volumes of Alcohol (90%) and of Distilled Water respectively which, when mixed and reduced to 60° F. (15·5° C.), will produce, allowing for contraction in volume, 1,000 Cc., 1 pint, or 1 gallon of each strength of Diluted Alcohol.

The Specific Gravity and the exact Excise (Sikes') strength at 60° F. (15·5° C.), in degrees over proof (O.P.) and under proof (U.P.), of each dilution, are given in the first column.

"Proof Spirit" has Sp. Gr. 0·920. This, in the olden time, was found to be the weakest spirit that could be put to the proof of igniting a little gunpowder moistened with it. If the spirit caught fire and inflamed the gunpowder it was designated "over proof," and if not, "under proof."

As a rule, in B.P. 1898, Alcohol (90%) replaced Rectified Spirit, and Alcohol (60%) Proof Spirit, where these were ordered in the 1885 Pharmacopœia, unless other dilutions were found more suitable as solvents.

Alcohol Dilutum, U.S. Now 41·5% Absolute Alcohol by weight (48·9% by volume) instead of 41% (48·6% by volume) in the 1890 U.S.P.

Spiritus Vini Dilutus, P. Austr. Prepared by mixing Spiritus Vini 7, Water 3. Sp. Gr. 0·892—0·896, *i.e.*, 68—69% vol.

TABLE FOR THE DILUTION OF ALCOHOL (90%) TO WEAKER OFFICIAL STRENGTHS.

Volume Percentage, Specific Gravity, and Excise Strength.	Alcohol. (90 per cent.)	Distilled Water.	Volume Produced.
70 per cent.	100 vols.	+ 31·05 vols.	= 128·57
Sp. Gr. 0·8900	777·8 Cc.	+ 241·6 Cc.	= 1000Cc.
22·7° O.P.†	*648·5 Gm.	+ 241·6 Gm.	= 1000Cc.
	15 oz. 266 m.	+ 4 oz. 398 m.	= 1 pint
	124 oz. 215 m.	+ 38 oz. 307 m.	= 1 gal.
	*6 lbs. 7⅞ oz.	+ 2 lbs. 6⅝ oz.	= 8 lbs. 14½ oz.
60 per cent.	100 vols.	+ 53·65 vols.	= 150
Sp. Gr. 0·9135	666·6 Cc.	+ 357·8 Cc.	= 1000Cc.
5·20° O.P.†	*555·9 Gm.	+ 357·8 Gm.	= 1000Cc.
	13 oz. 160 m.	+ 7 oz. 74 m.	= 1 pint
	106 oz. 320 m.	+ 57 oz. 112 m.	= 1 gal.
	*5 lbs. 9 oz.	+ 3 lbs. 9¼ oz.	= 9 lbs. 2¼ oz.
45 per cent.	100 vols.	+ 105·34 vols.	= 200
Sp. Gr. 0·9436	500 Cc.	+ 526·6 Cc.	= 1000Cc.
21·2° U.P.†	*417·2 Gm.	+ 526·6 Gm.	= 1000Cc.
	10 oz.	+ 10 oz. 256 m.	= 1 pint
	80 oz.	+ 84 oz. 130 m.	= 1 gal.
	*4 lbs. 2⅞ oz.	+ 5 lbs. 4¼ oz.	= 9 lbs. 7 oz.
20 per cent.	100 vols.	+ 355·8 vols.	= 450
Sp. Gr. 0·9760	222·2 Cc.	+ 790·7 Cc.	= 1000Cc.
64·9° U.P.†	*185·2 Gm.	+ 791 Gm.	= 1000Cc.
	4 oz. 213 m.	+ 15 oz. 390 m.	= 1 pint
	35 oz. 267 m.	+ 126 oz. 243 m.	= 1 gal.
	*1 lb. 13¾ oz.	+ 7 lbs. 14½ oz.	= 9 lbs. 12¼ oz.

NOTE.—*These figures are the **weights** necessary to produce a gallon and a litre respectively, at 15·5° C. Weighing in some instances may be more convenient in diluting large quantities, particularly in hot weather.—P.J. i./98,501. † Stevenson.

Spiritus Tenuior, Proof Spirit. B.P. 1885, contained 57% Ethyl Hydroxide by volume = 49% by weight. Sp. Gr. 0·920. Prepared by mixing 5 volumes rectified spirit, *s.g.* 0·838, with 3 volumes of distilled water, the contraction in volume being about 2·5%.

Rule for Calculation for Dilution of Alcohol.

If **V** be volume percentage of the stronger alcohol and **v** of the alcohol required—

I. *By volume.* Mix **v** volumes of the stronger alcohol with distilled water, *q.s.* after cooling to make **V** volumes,

e.g. to make an alcohol 43% from alcohol 95% take 43 volumes of the 95% and make up to 95 volumes.

11. *By weight.* Proceed on same lines by weight throughout.

To Transpose Volume per cent. of Alcohol into Weight per cent. The volume per cent. is multiplied by 0·7938, and the product divided by the Sp. Gr. of the liquid, *e.g.*, $\frac{80{\cdot}22 \text{ V per cent.} \times 0{\cdot}7938}{0{\cdot}863} =$ 73·794378 weight per cent. By proceeding reversely the weight per cent. can be expressed as volume per cent., thus, *e.g.*, 90·29 per cent. by weight $= \frac{0{\cdot}822}{0{\cdot}7938 \times x(\text{V per cent.})}$, $\therefore x = 93{\cdot}49$.

To state Volume per cent. as Alcohol of Proof Strength. Multiply V per cent. by 1·753 and deduct 100 from the product. Thus 65 V per cent. $= 65 \times 1{\cdot}753 - 100 = +13{\cdot}945°$ over proof. Further, alcohol of 25 V per cent. $= 25 \times 1{\cdot}753 - 100 = -56{\cdot}175°$ proof, *i.e.*, 56·175° under proof.

B.P. 1885 states: Proof spirit = about 57 per cent. alcohol (C_2H_5OH) by vol., *i.e.*, 57 parts alcohol with water produce 100 parts proof spirit. ∴ 1 part alcohol will make $\frac{100}{57} = 1{\cdot}753$ (about) parts proof strength.

ALCOHOL TABLE,

Sp. Gr. at 15·5° C.	Per cent. by weight	Per cent. by vol.	Sp. Gr. at 15·5° C.	Per cent. by weight	Per cent by vol.
0·9990	0·53	0·66	0·980	13·15	16·24
0·9980	1·06	1·34	0·979	13·92	17·17
0·9970	1·69	2·12	0·978	14·82	18·25
0·9960	2·28	2·86	0·977	15·67	19·28
0·9950	2·83	3·55	0·976	16·46	20·24
0·9940	3·41	4·27	0·975	17·25	21·19
0·993	4·00	5·00	0·974	18·08	22·18
9·992	4·62	5·78	0·973	18·35	23·10
0·991	5·25	6·55	0·972	19·67	24·08
0·990	5·87	7·32	0·971	20·50	25·07
0·989	6·57	8·18	0·970	21·31	26·04
0·988	7·27	9·04	0·969	22·08	26·95
0·987	7·93	9·86	0·968	22·85	27·86
0·986	8·64	10·78	0·967	23·62	28·77
0·985	9·36	11·61	0·966	24·38	29·67
0·984	10·08	12·49	0·965	25·14	30·57
0·983	10·85	13·43	0·964	25·86	31·40
0·982	11·62	14·37	0·963	26·53	32·19
0·981	12·38	15·30	0·962	27·21	32·98

Sp. Gr. at 15·5° C.	Per cent. by weight	Per cent. by vol.
0·961	27·93	33·81
0·960	28·56	34·54
0·959	29·20	35·28
0·958	29·87	36·04
0·957	30·44	36·70
0·956	31·00	37·34
0·955	31·62	38·04
0·954	32·25	38·75
0·953	32·87	39·47
0·952	33·47	40·14
0·951	34·05	40·79
0·950	34·52	41·32
0·949	35·00	41·84
0·948	35·50	42·40
0·947	36·00	42·95
0·946	36·56	43·56
0·945	37·11	44·18
0·944	37·67	44·79
0·943	38·22	45·41
0·942	38·78	46·02
0·941	39·30	46·59
0·940	39·80	47·13
0·939	40·30	47·67
0·938	40·80	48·21
0·937	41·30	48·75
0·936	41·80	49·29
0·935	42·29	49·81
0·934	42·76	50·31
0·933	43·24	50·82
0·932	43·71	51·32
0·931	44·18	51·82
0·930	44·64	52·29
0·929	45·09	52·77
0·928	45·55	53·24
0·927	46·00	53·72
0·926	46·46	54·19
0·925	46·91	54·66
0·924	47·36	55·13
0·923	47·82	55·60
0·922	48·27	56·07
0·921	48·73	56·54
0·920	49·16	56·98
0·919	49·64	57·45
0·918	50·09	57·92
0·917	50·52	58·36
0·916	50·96	58·80
0·915	51·38	59·22
0·914	51·79	59·63
0·913	52·23	60·07
0·912	52·68	60·52
0·911	53·13	60·97
0·910	53·57	61·40
0·909	54·00	61·84
0·908	54·48	62·31
0·907	54·95	62·79
0·906	55·41	63·24
0·905	55·86	63·69
0·904	56·32	64·14
0·903	56·77	64·58
0·902	57·21	65·01
0·901	57·63	65·41
0·900	58·05	65·81
0·899	58·50	66·25
0·898	58·95	66·69
0·897	59·39	67·11
0·896	59·83	67·53
0·895	60·26	67·93
0·894	60·67	68·33
0·893	61·08	68·72
0·892	61·50	69·11
0·891	61·92	69·50
0·890	62·36	69·92
0·889	62·82	70·35
0·888	63·26	70·77
0·887	63·70	71·17
0·886	64·13	71·58
0·885	64·57	71·98
0·884	65·09	72·38
0·883	65·42	72·77
0·882	65·83	73·15
0·881	64·26	73·54
0·880	66·70	73·93
0·879	67·13	74·33
0·878	67·54	74·70
0·877	67·96	75·08
0·876	68·38	75·45
0·875	63·79	75·83
0·874	69·21	76·20
0·873	69·63	76·57
0·872	70·04	76·94
0·871	70·44	77·29
0·870	70·84	77·64
0·869	71·25	78·00
0·868	71·67	78·36
0·867	72·09	78·73
0·866	72·52	79·12
0·865	72·96	79·50
0·864	73·38	79·85
0·863	73·79	80·22
0·862	74·23	80·60
0·861	74·68	81·00
0·860	75·14	81·40
0·859	75·59	81·80
0·858	76·04	82·19
0·857	76·46	82·54
0·856	76·88	82·90
0·855	77·29	83·25
0·854	77·71	83·60

Sp. Gr. at 15.5° C.	Per cent. by weight	Per cent. by vol.
0·853	78·12	83·94
0·852	78·52	84·27
0·851	78·92	84·60
0·850	79·32	84·93
0·849	79·72	85·26
0·848	80·13	85·59
0·847	80·54	85·94
0·846	80·96	86·28
0·845	81·36	86·61
0·844	81·76	86·93
0·843	82·15	87·24
0·842	82·54	87·55
0·841	82·92	87·85
0·840	83·31	88·10
0·839	83·69	88·46
0·838	84·08	88·76
0·837	84·48	89·08
0·836	84·88	89·39
0·835	85·27	89·70
0·834	85·65	89·99
0·833	86·04	90·29
0·832	86·42	90·58
0·831	86·81	90·88
0·830	87·19	91·17
0·829	87·58	91·46
0·828	87·96	91·75
0·827	88·36	92·05
0·826	88·76	92·36
0·825	89·16	92·66
0·824	89·54	92·94
0·823	89·92	93·23
0·822	90·29	93·49
0·821	90·64	93·75
0·820	91·00	94·00
0·819	91·36	94·26
0·818	91·71	94·51
0·817	92·07	94·76
0·816	92·44	95·03
0·815	92·81	95·29
0·814	93·18	95·55
0·813	93·55	95·82
0·812	93·93	96·08
0·811	94·28	96·32
0·810	94·62	96·55
0·809	94·97	96·78
0·808	95·32	97·02
0·807	95·68	97·27
0·806	96·03	97·51
0·805	96·37	97·73
0·804	96·70	97·94
0·803	97·03	98·16
0·802	97·37	98·37
0·801	97·70	98·59
0·800	98·03	98·80
0·799	98·34	98·98
0·798	98·66	99·16
0·797	98·96	99·35
0·796	99·29	99·55
0·795	99·61	99·75
0·794	99·94	99·86
0·7938	100·00	100·00

Based on figures of O. Hehner.

The danger of exposure to cold after excesses in alcohol.—L. i./99,740. Alcohol as a Food.—L. ii./04,1132.

Alcohol as therapeutic agent.—B.M.J. ii./05,4.

Alcohol strengthens no one, it only deadens the sense of weariness.—L. i./06,97.

The Gironde Wines. Full account.—L. i./06,319.

1½ ounces of pure alcohol is all that can be utilised as a food in the human body per diem = 3 ounces of brandy and whisky = 7 ounces sherry = 15 ounces champagne, claret and white wines.—L. ii./04,1437.

Even in small quantities is injurious to the proper working of the brain (Victor Horsley).—B.M.J.ii./05, 1656.

The 'food value' of alcohol depends on the amount taken and the tolerance of the individual.—Dixon.

Dixon points out that the relative toxicity of the homologous series of alcohols increases thus: Methyl Alcohol 0·8, Ethyl 1, Propyl 2, Butyl 3, Amyl 4.

Spiritus Vini Gallici.

Brandy. Contains 40 to 50% (or 60% in case of good Cognac) by volume absolute alcohol. Yields 0·6 to 1·2% Extractive, 0·01 to 0·02% ash, 0·3 to 0·8% sugar, 80 in 100,000 parts compound ethers. Suggested as a standard of purity (Analyst, Feb., 1905). *See also* Jl. Socty. Chem. Ind., Feb., 1905.

Spiritus Vini Cognac, P. Austr., 44–48% vol. Chemical valuation on ratio of ethers to alcohol is not invariably sound.—C.D. ii./04,969.

Brandy Sterules, Hypodermic. Convenient for the emergency bag. Contain 1 drachm.—L. i./05,1,583.

Spiritus Frumenti, U.S. Whisky prepared by distillation of fermented grain—Indian corn, rye, wheat, barley. Sp. Gr. 0·924, at 15°C, contains 37 to 47% by weight (44 to 45% by volume) C_2H_5OH.

Special Analytical Commission on Whisky and Details of Manufacture.—'The Hospital,' Apl. 7, 06, *p.*8.

Vinum Album, U.S. By fermenting grape juice (*Vitis Vinifera*)—Sp. Gr. at 15·6°, not less than 0·990 nor more than 1·010—containing not less than 8·5 nor more than 15% by volume absolute alcohol.

Vinum Rubrum is from the red grape and identical with above in alcohol content.

Basis wines imported, to be put under Excise.—B.M.J. i./06,1064; L. i./06,1262.

Spiritus Methylatus, Methylated Spirit.

A mixture of rectified spirit with wood naphtha, containing 10% by volume of the latter. Sp. Gr. 0·827 to 0·828.

This may be used, by permission of the Excise authorities, by manufacturers who have given a bond, in the preparation of medicines in which, when finished, there is no trace remaining as alcohol, but cannot be retailed without containing in addition ⅜% (=0·375%) by volume of mineral naphtha (petroleum oil) of Sp. Gr. not less than 0·8; it is then known as **Denaturalised Methylated Spirit** and forms an opaque mixture with water.

Not more than 1 gallon of methylated spirit may be sold to any one person at one time on one day, and not more than 50 gallons may be kept in stock by licensed retailers, nor may it be sold between the hours of 10 p.m. on Saturday and 8 a.m. on Monday.

Denaturalised spirit in Germany contains 2½% of a mixture of wood spirit 80 parts, pyridine bases 20 parts.

Methods of detecting and determining Methyl Alcohol in pharmacopœial preparations. The oxidation method of Thorpe & Holmes consisting in weighing the amount of Carbon Dioxide produced from the Methyl Alcohol is described.—P.J. i./04,189. U.S. gives a method.

A common intoxicant in Aberdeen.—L. ii./03,897.

Alcohol 75% (about 5 volumes of 90%, or of Methylated Spirit, to 1 of water) is used for sterilising the skin of patients, surgeons' hands and instruments.

Spiritus Coloniensis, Arzn., *Eau de Cologne.*

Oil of Bergamot 20, Oil of Lemon 20, Tincture of Musk (1 in 50 Alc. 45%) 5, Oil of Neroli 2, Oil of Cinnamon 1, Oil of Cloves 1, Oil of Rose 1, Alcohol (90%) 1,800, Distilled Water 150 (all by weight). Macerate for 8 days, and filter.

Spiritus Myrciæ, Bay Rum, U.S., 1890.

Oil of *Myrcia acris* (*Myrtaceæ*) 16, Oil of Orange Peel 1, Oil of Pimento 1, Alcohol (94%) 1,220. Mix, and add gradually Water to 2,000. After 8 days, filter. Of considerable renown as a **Hair Lotion.**

Lotio Evaporans, St. M.'s H. Methylated Spirit 1 drachm, Solution of Ammonium Acetate 1 drachm, Water to 1 ounce.

Aqua Mellis, Honey Water.

Yellow Sandal Wood, in shavings, 16, Alcohol (90%) 640. Macerate 7 days, and pour off the alcohol. Add to the marc, Concentrated Rose and Orange Flower Waters, of each 160, shake well, decant, and add to the alcohol set aside. To this mixture add English Oil of Lavender, Oil of Cloves, of each 2, Oil of Bergamot 1, Oil of Nutmeg, Oil of Sandal, of each ½.

Alcohol Allylicum, $CH_2{=}CH{-}CH_2.OH = 57{\cdot}61$ (58·048 I. Wts.).

A colourless liquid miscible with water, with a pungent odour and burning taste. It inhibits bacterial growth.

Alcohol Amylicum. (*Off.*). $C_5H_{11}OH = 87{\cdot}43$ (88·096 I. Wts.).

Consists principally of iso-primary amylic alcohol,

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!CH{-}CH_2{-}CH_2.OH,$$

and is prepared by purifying and fractionating fusel oil, collecting that distilling between 257° and 289° F.

Alcohol Methylicum, $CH_3.OH = 31{\cdot}79$ (32·032 I. Wts.). **Pyroxylic Spirit.**

Dose.— 30 to 60 minims (1·8 to 3·5 Cc.).

If absolute, has Sp. Gr. 0·796, but is not allowed by the Excise to be retailed pure, unless duty-paid. Is recommended internally for vomiting of pregnancy, sometimes combined with menthol. The commercial substance is known as wood naphtha, and contains acetone and other empyreumatic impurities. A purer preparation used in the arts has Sp. Gr. 0·81. It is a solvent of pyroxylin.

May cause optic atrophy, and so blindness, if drunk, or if too much be inhaled at work.—B.M.J., i./04, 151. L.ii./04, 1255 ; Cushny, 144.

Method of detection.—P.J., ii./05, 440.

Antidotes.—In America poisoning by so-called deodorised spirit is common. In acute poisoning treat by rectal injections and stomach pump.—B.M.J. Give brandy, strychnine, coffee.

Further, for the subsequent amaurosis give pilocarpine and potassium iodide, and later strychnine hypodermically or *per os.*

Acetone. Dimethyl-Ketone. U.S. $CH_3.CO.CH_3 = 57{\cdot}61$ (58·048 I. Wts.).

A clear, colourless, light, neutral liquid, with ethereal odour and camphoraceous taste, obtained by the dry distillation of acetates, miscible with water, alcohol, ether, chloroform, and oils, and is a ready solvent of fats and resins, rubber, pyroxylin celluloid, also of cantharidin (about 1 in 40). It takes up about 25 times its volume of acetylene. If pure, its Sp. Gr. is 0·7966 at 15° C. Boils at 56·5° C. Is largely used in the manufacture of chloroform. It has been employed in dyspnœa in dose of 1 to 1½ drachms daily.

If 20Cc. be mixed with 0·1Cc. of N/10 potassium permanganate, colour remains 15 minutes (limit of empyreumatic substances, U.S.).

Our experiments showed commercial acetone in this country to answer this requirement.

Iodo-Acetone.

A 2% Solution of Iodine in Acetone is used to sterilise catgut. First steep in ligroin to free from fat. —L. i./06,1193. Iodo-Acetone is also sometimes used "1 in 5 or 1 in 10."—L. i./06,1366. Further information wanted at time of going to press.

ALDEHYDA.

Aldehydum Absolutum. *Syn.* Acetaldehyde. $CH_3.COH.$ = 43·7 (44·032 I. Wts.).

A colourless mobile liquid, irritating when inhaled. Sp. Gr. 0·7876 at 16° C. B.Pt. 21° C. Becomes acid on keeping exposed to air—oxidation to acetic acid. Polymerises with rapidity in presence of sulphuric acid at atmospheric temperature into paraldehyde (*vide infra*), but if temperature be below 0° C. metaldehyde is formed.

Aldehydum Dilutum.

A mixture of alcohol and Aldehyde, containing 15% of the latter,—an oxidation product of alcohol preceding the formation of acetic acid, into which, if in the pure state, it readily passes. Diluted Aldehyde is a colourless liquid neutral to test papers, and has an ethereal suffocating odour, producing spasm of the glottis when respired.

Its action is antagonistic to that of the Nitrites.—(D. J. Leech).

Vapor Aldehydi.

Diluted Aldehyde 80 minims, water to 1 ounce.

A teaspoonful to a pint of water at 140° F.

Useful in catarrhal congestions and in ozœna.

Metaldehyde $(CH_3.COH)_x = [43·7 (44·032 I. Wts.)]_x$.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.), in cachet or pills. In silky white acicular crystals, slightly soluble in alcohol and ether, insoluble in water. Has been used as a sedative.

Paraldehydum $(CH_3.COH)_3 = 131·1 (132·096 I. Wts.)$ (*Off.*) U.S. *Dose.*—30 to 120 minims (1·8 to 7 Cc.), or more, in diluted syrup or almond mixture, repeated if needed in ½ an hour.

A colourless liquid at the ordinary temperature, although it, like glacial acetic acid, crystallizes if cooled below 50° F.; Sp. Gr. 0·998; may be obtained by treating Aldehyde with dilute sulphuric or nitric acid. Its odour and taste somewhat resemble Aldehyde, but it does not cause the same suffocating action when respired. ***Soluble*** 1 in 10 of water, and in all proportions in alcohol 90%. It and its solid congener Metaldehyde are polymers

of Aldehyde. It is a useful sedative. In insomnia of tricuspid incompetency is successful.—M.P. ii./04,515. Has no depressent effect on the heart, never causes excitement, and is quicker in action than chloral.—Dixon.

Elixir Paraldehydi.

Dose.—1 to 3 drachms (3·5 to 10·5 Cc.).

Paraldehyde 240, Glycerin 240, Alcohol (90%) 480, Oil of Cinnamon 4, Oil of Bitter Orange 8, Saccharin 1.

Mistura Paraldehydi.

Paraldehyde 2 drachms, Essential Oil of Almonds (*sine* Acid. Hydrocyanic) 3 minims, Syrup 1 ounce, Liquid Extract of Liquorice 2 drachms, water to 4 ounces. This covers the taste of the compound and forms four doses of ½-drachm or two doses of 1 drachm.

It is more satisfactory than mixtures flavoured with Lemon Essence—P.J. i./04,220—but the taste of the substance is so nauseating that it is difficult to cover it.

An Emulsion of Paraldehyde 2 drachms, Tragacanth Mucilage ½ ounce, Syrup of Orange 1 ounce, keeps fairly well. Alcohol is not advisable for flavouring purposes, as the sedative action may be impeded by the stimulant properties of the spirit.—C.D. i./04,303. A mixture of Tragacanth and Acacia mucilage is recommended.—C.D. i./06,344. Another form: Paraldehyde 1 drachm, Quillaia Tincture 20 minims, Water to ½ or 1 ounce.—B.M.J. i./06.318,480. The following are preferable:—

Paraldehyde Capsules, 20, 30 and 40 minims.

Dose.—1 or more.

It resembles chloral in its physiological action but, differs from it in strengthening the heart's action, whilst it diminishes its frequency. It greatly increases the flow of urine, but does not affect the skin, nor does it give rise to digestive disturbances, to headache, or other unpleasant symptoms. Is satisfactory as an enema.—B.M.J. i./83,215,956; ii./91,115.

Occasionally failed, producing slight excitement and and vomiting.—B.M.J. ii./90,237.

Poisonous effects after 13 drachms.—L. ii./00,875.

Three and a half ounces taken by error; 9 hours afterwards strychnine hypodermically and ammonia applied and injected, recovered consciousness in 34 hours.—B.M.J. ii./91,1254; M.C. Jan. 1892,256. Two ounces have proved fatal.—W.W.W.

Of use in spasmodic asthma, relieves spasm, and induces sleep.—B.M.J. i./93,65; ii./96,725.

Aldehydum Formicum, H.COH. = 29·79 (30·016 I. Wts.).

Formic Aldehyde in vapour is an active antiseptic, preventing decomposition and fermentation, while it is comparatively non-poisonous.—L. ii./97,695.

Formaldehydum Solutum, P.G. iv., P. Austr.

Syn. FORMOL, FORMALIN, METHANAL, METHYL ALDEHYDE. *Dose.*—1 minim, well diluted.

An aqueous solution of Formic Aldehyde, containing about 40%. Sp. Gr. 1·079 to 1·081. **P. Belg.** about 30%. Sp. Gr. 1·086 to 1·088.

Liquor Formaldehydi, U.S.—Contains not less than 37% by weight absolute formaldehyde (H.COH). Sp. Gr. 1·075 to 1·078 at 25° C. Absence of formic and other acids, also lead, iron and copper is ensured. Assay method by means of sodium hydroxide and hydrogen peroxide is given.

It is prepared by oxidation of methyl alcohol.

Uses.—For wound treatment, and for sterilising surgical instruments and the hands of operators, *e.g.*, as Lysoform, *v. p.* 108. For disinfecting rooms, a 1 or 2% solution of Formalin may be used as spray, and is non-injurious to coloured fabrics. This strength has also been suggested as a pigment and spray for diphtheria. Useful as a preservative for embalming and the preservation of corpses for dissection. It shrivels up soft corns causing them finally to drop off if applied daily. Under the name of **Durine** a preparation is sold for this purpose.

A ½% solution kills most organisms.—Dixon.

Formol is more especially useful as a hardening agent for microscopic objects and museum specimens in place of alcohol, as it does not cause shrinking or clouding of tissue, particularly of eyes; cellular structures and colouring matters are well preserved. As a hardener, Formol should be diluted about 25 times, and about 10 times for museum use, but for preservative purposes a far weaker solution is sufficient.

Ophthalmia, trachoma and sweating feet are well treated by a lotion. Ringworm, lupus, laryngeal growths by pigment of 1 to 3 glycerin. A spray or douche is useful for ozœna.

Antidotes.—Stomach tube and emetics followed by alkaline drinks, sal volatile (or ammonia in other suitable form), alcohol.

Formaldehyde is always a constituent of the air of towns as it is a product of combustion of wood, paper, coal peat, petroleum and tobacco.—Bull, Soc. Chim. 1905, iii. 33, p.386.

Local application to throat in lotion for pertussis.—B.M.J.E. i./99,48.

Formalin applied to sarcoma and bleeding tumours, checks hæmorrhage, hardens the substance and assists their removal.—B.M.J. i./99,337.

General uses in phthisis.—B.M.J. ii./03, 1050.

Angina, especially angina follicularis, treated by painting the tonsils with 2% solution in glycerin.—M. 1901,85.

A solution of 1 in 100,000 of the blood has been passed through the lungs in phthisis with encouraging results.—L. i./03,98.

For puerperal fever uterine injection of 1 ounce of glycerin with 3% of Formalin.—L. ii./03,1229,1251. Also 1 minim doses *per os*.—L. ii./03,1163.

Alopecia areata treated with 10% or stronger compressess.—M. 1901, 85.

Rabies is said to have been cured by intravenous injections of Formalin.—Med. Rec., March, 1903.

Inoperable cancer treated by compresses of 2% of *Formaldehyde* (*i.e.*, commercial 40% solution 1, water 19).—B.M.J. i./03,1257,1348.

Whooping cough treated by, *vide* Paraform, *p.* 109.

Formalin is estimated by means of silver nitrate.—Y.B.P. 1902,83; or as follows:—Dilute 10 Cc. to 200 with water, neutralise and add 10 Cc. of this dilution to ammonium chloride 0·5 Gm. dissolved in 3 or 4 Cc. of water. Titrate with normal potassium hydroxide, of which 1 Cc. = 0·045 Gm. Formaldehyde, using litmus as indicator.—Y.B.P. 1903,84.

Eczema in *dry* form should be treated with moist formalin application, *e.g.*, 1 of formalin (40%) in a starch and water jelly 99.

To eczema that is weeping, apply Lysoform or other formalin dusting powder, *v.p.*108. Avoid preparations of gelatin, which acts as a nidus for bacterial growth. The staphylo-

coccus of eczema is killed by 1% 'Formalin.'—E. Blake.

Detection of Formalin in Milk.—According to Rideal, 1 part of formalin in 2,500 of milk can be detected by simply warming; but it is better to distil the milk; the distillate has the odour of formaldehyde, but the preservative is not wholly volatilised even when evaporated to dryness at 100°C. A portion of the formaldehyde forms non-volatile compounds with certain of the milk constituents. Thus in employing colour tests for formaldehyde a notably weaker reaction is obtained when milk containing formalin is distilled and the distillate tested than when water containing the same proportion of formalin is similarly treated.

O. Hehner has determined the rate of disappearance of formalin when added to milk. He found that after one week no formalin could be detected in a sample which originally contained 1 part of formalin in 100,000 parts of milk; after two weeks none could be found in the 1 : 50,000 sample; while after three weeks there was only the faintest trace to be detected in the 1 : 25,000 sample. The experiments were made in cool weather, and the formaldehyde was tested for by Schiff's reagent in the distillate from the milk.

Schiff's Reagent.—Mix 40 Cc. of a 0·5% solution of magenta with 250 Cc. of water, add 10 Cc. of sodium bisulphite solution Sp. Gr. 1·375, and then 10 Cc. of pure strong sulphuric acid; allow to stand for some time, when it will become colourless. It may also be prepared when required for use by adding sufficient of a solution of sulphurous acid to decolorise some of the magenta solution. If the sulphurous acid is added in large excess, traces of formaldehyde will not be indicated. Reddish violet colour proves presence of formalin. Other aldehydes, including aromatic aldehydes, also give this; but these would hardly be suspected.

Further Test for Formalin in Milk.—To 10 Cc. of the milk add 10 drops of 5% phloroglucin solution; shake and add further 15 drops Liquor Sodæ 5%. Salmon colour (not yellowish tint) indicates addition of formalin.—P.J.ii./04,851; *c. also* Milk Analysis, *p.* 857.

Formaldehyde Inhalant. Chowry Muthu.

Formalin 40% 1, Chloroform 1, Alcohol 90% 2.

For inhalation in phthisis. 5 to 10 drops are sprinkled on cotton wool contained in a perforated zinc inhaler of pyramidal shape and renewed every two hours or so. The success of the treatment of phthisis by this method lies in its being perseveringly used for as long as possible every day.—B.M.J. ii./02,1672.

The proportion of chloroform seems excessive.—W.W.W. A small bulbous inhaler with absorbent material better—to be inhaled *per os*, and exhaled through the nose, thus bathing the whole respiratory tract.—L. i./03,771.

Collutorium Formalini. R.D.H.

Formalin 18 minims, Peppermint Oil 5 minims,

Alcohol 90% 1½ drachms, Peppermint Water to 1 ounce. A few drops to ½ tumbler of water for use.

Collutorium Formalini cum Creolin. R.D.H.

Formalin 1 drachm, Creolin 15 minims, Oil of Wintergreen 5 minims, Oil of Bergamot 5 minims, Spirit of Chloroform to 1 ounce. Use as above.

Gargarisma Formaldehydi, G.H.

Formalin Solution 1 minim to Water 1 ounce.

Aldol. *β* Oxybutyric Aldehyde.

$CH_3.CH(OH).CH_2COH = 87{\cdot}40$ (88·064 I. Wts.).

Is produced by allowing hydrochloric acid to act upon aldehyde for several days. A thick liquid, soluble in 2 of water, and easily soluble in alcohol. It polymerises to a solid crystalline compound, Paraldol. It is a powerful hypnotic.—C.D. i./06,162.

Has agreeable taste.—L. i./06,1191.

Allmatein.

$CH_2O_2 : (C_{16}H_{12}O_5)_2 : CH_2$ (?) = 623·50 (628·224 I. Wts.)

A compound made by acting upon hæmatoxylin with formaldehyde. A reddish powder, ***soluble*** in alcohol and glycerin, suggested as a substitute for iopoform.—B.M.J. ii./04,1468; P.J. ii./04,634; J.C.S.Abst.i./05, 49; F.N. 1906,17.

Amyloform.

A compound prepared by the action of formic aldehyde on starch; is an inodorous, insoluble, white powder, unaltered by heat. Has been used as an antiseptic dressing for wounds.—P.J. ii./96,290; L. ii./97,40.

Citarin. *Syn.* Sodium Anhydromethylene Citrate

$$CH_2-COONa$$
$$|$$
$$CO<\begin{matrix}CH_2\\CO\end{matrix}>O = 246{\cdot}29\ (248{\cdot}148\ \text{I.Wts.})$$
$$|$$
$$CH_2-COONa$$

Dose.—15 to 30 grains (1 to 2 Gm.) three or more times a day.

Soluble 1 in less than 1 of water, and only slightly soluble in alcohol 90%. A compound of formaldehyde and citric acid, easily liberating formaldehyde. A uric acid solvent and eliminant. Recommended in the treatment of gout, rheumatism, and uræmia.

Dextroform.

A compound of dextrin and formic aldehyde; a white

powder soluble in water and glycerin; introduced as an antiseptic, specially useful in gonorrhœa.—L. ii./97,40.

Glutol. *Syn.* FORMALIN-GELATIN.

A compound of formic aldehyde and gelatin in whitish granular insoluble powder; recommended as an antiseptic dressing for burns, cavities, and suppurating ulcers.—Pr. lix.,220; B.M.J.E. ii./99,95.

Prevents the pitting of smallpox.—L. i./02,1053.

Proteol. A formaldehyde-casein compound, applied as a dusting powder; suitable for use on the skin after incisions. A Proteol Soap and Gauze are also made.—L. i./06,1268.

Lysoform. A liquid formaldehyde potash soap. It is highly antiseptic, relatively non-poisonous, inodorous, deodorant and cheap; has the highest bactericidal action, even in 2 to 5% solution; does not coagulate albumin, and is miscible with water and alcohol in all proportions. It is suitable for surgical operations and for instrument disinfection. A 5% solution is rapidly fatal to *B. typhi abdominalis*, *B. coli communis*, and the *Staphylococcus pyogenes aureus*, and a 3% solution destroys *B. anthracis* spores in 24 hours. A 2% solution is sufficient for general purposes, and is better freshly prepared. The stock bottles should be kept well corked. ***Uses.***—In using warm solutions a temperature of 40° to 50° C. should not be exceeded; this is suitable for antiseptic irrigation of the vagina, uterus, abscess cavities, &c. Diluted it is useful for psoriasis, lupus, eczema, and as a wash for perspiring feet. Impetigo may be treated with 5% **ointment** combined with carbolic acid and ammoniated mercury, or same strength with zinc ointment (paraffin basis) for eczema. 25 to 50% ointments with lanolin basis are applied to ringworm and alopecia areata. A 10% ointment is used in psoriasis. For seborrhœa a 10% ointment with 5% resorcin is useful. 10 to 15% in gall ointment is suitable for piles. A **Mouth Wash, Tooth Paste, Tooth Powder, Dusting Powder** for moist surfaces, bed sores and syphylitic ulcers, and **Toilet Soap** are prepared, also **Pessaries** of Cacao Butter, containing 2 grains each. In the sick room and operating theatre its deodorant properties will be evident. It cleanses suppurating wounds and has styptic action on bleeding

surfaces. This strength is also suitable for bites, stings and burns. It is used for hand disinfection 1 to 2% ; it combines the mechanical action of soap, lathering profusely, with its bactericidal power, and, therefore, penetrates the skin, lubricates it, and keeps it soft. It is valuable also for general household disinfection, for deodorisation and cleaning. Good results have been obtained with it in veterinary use.—L. ii./03,1307.

A **Lysoform Dental Dressing** in paste form is also prepared.

Pasta Formalini, R.D.H. Cocaine hydrochloride 1 drachm, Thymol 1 drachm. Triturate thoroughly and add Formaldehyde Solution 40 minims, Glycerin 10 minims, Zinc Oxide 2 drachms. Mix.

Paraform, Paraformic Aldehyde, Tri-oxymethylene - Formaldehydum Polymerisatum, P. Belg. $(H.COH)_3 = 89{\cdot}37$ (90·048 I. Wts.).

A polymer of formic aldehyde, in white friable amorphous masses, but slightly soluble in water, with an irritating vapour. Heated by an enclosed spirit lamp, it sublimes, combines with the products of combustion, is converted into formic aldehyde, and is a convenient means of applying the latter in vapour as an antiseptic and disinfectant. Tablets of 1 gramme, **Formalin-Disinfecting Tablets**, are prepared for use in the Alformant vaporiser, the number requisite being from one to twenty tablets per 1,000 cubic feet, the latter number ensuring thorough disinfection.—P.J. ii./97,101; B.M.J. i./98,1542; B.M.J.E. ii./98,23.

Catheters may be maintained aseptic by wrapping in lint impregnated with 20% of paraform.

Paraform Collodion, 25% strength, applied three times a day to warts is efficacious.

Whooping-cough treated by inhalation of Formalin vapour produced by volatilising one tablet per 700 cubic foot space—patients remain in a room thus fumigated a quarter of an hour.—M.1901,85.

Septoform. A compound of formaldehyde and terpenes.

Formicin.—*Dose*, 10 to 15 grains (0·65 to 1·0 Gm.). A compound of Formalin and Acetamide, colourless syrupy liquid, Sp. Gr. 1·24–1·26, miscible in all proportions with water, alcohol and chloroform. Freely soluble in glycerin.

Suggested as an antiseptic injection in tuberculosis in 5% solution. In cystitis 2% warmed and as a wash for cavities. —B.M.J.E. ii./05, 99.

Formawn.—Said to be a formaldehyde-menthol compound of the composition chloromethyl menthylether $C_{11}H_{21}OCl$. It is inhaled by dissolving a tablet in hot water in a special inhaler, and a "nose wool" is supplied for plugging the nostrils in nasal catarrh.—L. ii./04,1792; B.M.J E. ii./04, 8.

Formamint Tablets contain 0·01 Gm. "Formaldehyde" (presumably paraform) in each. In infectious diseases and as prophylactic.—B.M.J.E. i./06,8.

ALOES.

Aloe Barbadensis (*Off.*).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Barbados or Curaçao Aloes, from *Aloe vera, A. chinensis* (*Liliaceæ*), and other species; commercially comes from Curaçao, and is preferred to

Aloe Socotrina (*Off.*). *Syn.* Hepatic Aloes.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Socotrine or Zanzibar Aloes, from *Aloe Perryi* and probably other species; imported principally *via* Bombay.

The Natal or Cape varieties of Aloes are not official.

Aloe (U.S.) now replaces Aloe Barbadensis and Aloe Socotrina in the 1890 U.S.P.

Examination and Assay of Aloes.—P.J. ii./05,554.

Aloe Purificata, U.S. Prepared by melting and dissolving in $\frac{1}{3}$ of its weight of alcohol, straining and evaporating to dryness.

Decoctum Aloes Compositum (*Off.*).

Dose.—$\frac{1}{2}$ to 2 ounces (15 to 60 Cc.).

Has Extract of Barbados Aloes 1 in 100. Was known as *Baume de Vie*.

Alternative Method of Making:—Rub the myrrh and potassium carbonate with a small quantity of water to form an emulsion, dissolving the aloes in water, or better in the compound tincture of cardamoms, adding the saffron to the mixed liquids; decant. Kpees well.—C.D. i./05, 464.

Extractum Aloes Barbadensis (*Off.*).

Dose.—1 to 4 grains (0·065 to 0·26 Gm.).

Barbados Aloes yield about 75% of Extract.

Extractum Aloes Socotrinæ. B.P. 1885 (not now official). Yield about 45%.

Dose.—2 to 4 grains (0·13 to 0·26 Gm.).

Extractum Colocynthidis Compositum (*Off.*).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.). *Vide also* p. 296.

Contains about half its weight of Extract of Aloes. That of U.S. contains same quantity of purified Aloes.

Pilula Aloes Barbadensis (*Off.*). As B.P. 1885.

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Pilula Aloes et Asafetidæ (*Off.*). As B.P. 1885.

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Pilula Aloes et Ferri (*Off.*).

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Exsiccated Ferrous Sulphate 1, Barbados Aloes 2, Compound Cinnamon Powder 3, Glucose Syrup 3 or *q.s.*

Tablets are also prepared 4 grains each. An excellent remedy for habitual constipation.—W. W. W.

Pilula Aloes cum Mastiche.

Barbados Aloes 2 grains, Mastic $\frac{2}{3}$ grain, Rose Petals $\frac{1}{3}$ grain, Syrup *q.s.* They act principally on the bowel, Mastic being insoluble in the stomach.

Pilula Aloes et Myrrhæ (*Off.*).

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Socotrine Aloes 2, Myrrh 1, Syrup of Glucose 1½ or *q.s.* Tablets are prepared 4 grains each.

Pilula Aloes, Cascaræ et Hyoscyami.

Extract of Barbados Aloes 1, Extract of Cascara 1, Extract of Hyoscyamus 1. In grains for one pill.

Pilula Aloes, Nucis Vomicæ et Belladonnæ.

Extract of Socotrine Aloes 1, Ext. of Nux Vomica ½, Extract of Belladonna ¼. In grains for one pill.

Pilula Aloes Socotrinæ (*Off.*).

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Pilula Cambogiæ Composita (*Off.*).

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Gamboge 1, Barbados Aloes 1, Compound Powder of Cinnamon 1, Hard Soap 2, Syrup of Glucose 1 or *q.s.*

Tinctura Aloes (*Off.*).

Dose.—1½ to 2 drachms (4·3 to 7 Cc.) or ½ to 1 drachm (1·8 to 3·5 Cc.) repeated.

Extract of Barbados Aloes 1, Liquid Extract of Liquorice 6, Alcohol (45%) *q.s.* to 40.

U.S. has 'Purified Aloes' 1, Glycerin 2, Diluted Alcohol 10.

Glycerinum Aloes.

Evaporate Aloes Tincture 6 to 3, gradually adding Glycerin 30. Pigment for bed sores and anal fissures.

Dewees's Emmenagogue Mixture (H.).

Dose.—½ ounce thrice daily.

Tincture of Aloes 8, Tincture of Ferric Chloride 6, Tincture of Cantharides 2, Ammoniated Tincture of Guaiacum 3, Syrup to 90. Largely employed in the U.S. in functional and organic amenorrhœa.

Aloe Soluta, P. Belg. Aloes 50, Sodium Carbonate 1, Water 44, Ammonia (17%) 5, *s.a.*

Tinctura Aloes Composita, P. Austr.

Average Dose.—1 to 2 drachms (3·5 to 7 Cc.).

Cape Aloes 15, Gentian Root 2½, Rhubarb 2½, Zedoary Root 2½, Saffron 2½, Alcohol (70%) 500.

Tinctura Aloes et Myrrhæ, U.S.

Average Dose.—30 minims. Aloes purified 1, Myrrh 1, Glycyrrhiza 1, Alcohol 7½, Water to 10.

Tinctura Benzoini Composita (*Off.*). *Syn.* FRIARS' BALSAM, TRAUMATIC BALSAM.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.), with yolk of egg. U.S. has approximately same composition.

Undiluted as a wound dressing. A drachm to a pint of hot water is valuable as a inhalation in acute laryngitis.

Tinctura Benzoini Simplex, B.P.C.

One in 10 of Alcohol (90%). (U.S. 1 in 5.). One in Rose Water 40, useful as a face lotion in urticaria and in irritable conditions of the skin.

Aloin, the crystalline principle (preferably Barbaloin), may replace aloes if desired. A weak alkaline solution is said to prevent the griping tendency of aloes, and extract of liquorice covers the nauseous taste. The Compound Decoction of Aloes contains these with the aromatic Compound Tincture of Cardamoms, but the process for preparing it is too complicated. We suggest :—

Mistura Aloes.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

Barbados Aloes 30, Myrrh 15, Potassium Carbonate 15, mix, add Liquid Extract of Liquorice 120 ; dissolve, and add Compound Tincture of Cardamoms *q.s.* to 1,000. Strain, set aside, and, after seven days, decant. Contains Aloes 1 in 33, and has about three times the activity and

virtue of the Compound Decoction of Aloes, *sine* Saffron. No boiling is needed.

Alkalis assist the oxidation of aloins into Emodin, which is tri-oxy-methyl-anthraquinone, *v.pp.* 218, 648.—P.J. ii./98,78,325.

Pulvis Aloes cum Canella, P.D. 1836. *Hiera Picra. Dose.*—3 to 10 grains (0·2 to 0·65 Gm.). Hepatic Aloes 16, White Canella Bark 3. Much used as a domestic emmenagogue.

Aloin, $C_{16}H_{16}O_7, 3H_2O = 371{\cdot}36$ (374·176 I.Wts.). (*Off*). Jowett & Potter have recently confirmed Tilden's original formula for Barbaloin, which was $C_{16}H_{18}O_7 = 319{\cdot}72$ (322·144, I. Wts.).

Official dose.—½ to 2 grains (0·032 to 0·13 Gm.). ¼ grain may be considered an aperient, and 1 grain a full purgative dose.—U.S. Dispensatory. In a pill with hard soap.

A principle obtained officially from Barbados or Socotrine Aloes in odourless yellow crystals, having the characteristic taste of aloes; soluble in cold water, 1 in 140 (Barbaloin), in alcohol 90%, 1 in 20. Aloes contains as much as 30% of Aloin. Recent Aloin Chemistry.—Naylor, P.J., July 28, 1906, *p.* 73.

Practically all the Aloin in U.S.A. is made from Curaçao Aloes, and all in England from Barbados Aloes.—Am. Jl. Ph. lxx. 398.

Tablets of Aloin, $\frac{1}{10}$ and ½ grain.

Pilula Aloin Composita.—For constipation, Sir A. Clark recommended Aloin, extract of nux vomica, sulphate of iron, myrrh, and soap, of each ½ grain in a pill taken half an hour before last meal of the day. If faeces be hard and dry and there be no special heart weakness, add ½ grain of ipecacuanha, and should griping be caused add also ½ grain of extract of belladonna.

Tablets, Anti-Constipation. — Represent the above without ipecacuanha.

Pilula Aloin, Strychninæ et Belladonnæ.—*Dose.*—1 or 2. Aloin ⅕, Strychnine $\frac{1}{60}$, Alcoholic Extract of Belladonna, ⅛, in each; in fractions of a grain, make one pill; of a gramme, fifteen pills.

Tablets of Aloin Compound represent the latter with Ipecacuanha $\frac{1}{16}$ gr.

Pilulæ Laxativæ Compositæ, U.S. 100 pills contain Aloin 1·3, Strychnine 0·05, Extract of Belladonna Leaves 0·8, Ipecacuanha 0·4, Glycyrrhiza 4·6 Gm., Syrup, *q.s.*

ALUMINIUM.

Al = 26·90 (27·1 I. Wts.)

Glycerinum Aluminis (*Off.*). 1 in 6, *v.p.* 367.

Ophthalmic Discs contain $\frac{1}{250}$ grain of alum in each.

Points of Alum, also of **Copper Sulphate,** mounted in wooden cases, are prepared for ophthalmic and other uses.

'Solube' Aluminis 10 grains (0·65 Gm.).

One dissolved in two or three ounces of water may be used as an eye wash, gargle, mouth wash, &c.

Alumini Sulphas, U.S. (Aluminum Trisulphate). $Al_2(SO_4)_3 + 16H_2O$ = 625·90 (625·93 U.S.) (630·636 I.Wts.).

White crystalline powder or lumps. ***Soluble*** 1 in 1 of water nearly. Loses about 45·7% water of crystallisation on heating to 200° C.

Incompatible with alkalis and alkaline carbonates.

Liquor Aluminii Acetici, P.G., P. Austr. *Syn.* Burow's Solution. **Solutum Aluminii Acetici, P. Belg.**

Dissolve Aluminium Sulphate 30 in water 80, add Acetic Acid B.P., by weight, 34, and while constantly shaking pour in by degrees Precipitated Calcium Carbonate 13 mixed with water 20. Set aside for 24 hours to deposit, and shake frequently, then decant, press the sediment, and filter the solution. Contains $7\frac{1}{2}$ to 8% of Aluminium Sub-acetate. Diluted 1 to 3 of orange flower water for mouth lotion.

Diluted with twice as much water, thus making a $2\frac{1}{2}$% solution, it has been used as an antiseptic lotion, and gauze impregnated with a 5% solution has been used as a dressing (*vide* Gauze, ribbon, *p.* 375).

Aluminii Acetas, $Al_2(OH)_2(C_2H_3O_2)_4(?)$ = 321·88 (324·312 I.Wts.).

Crystalline, slightly soluble in water. Is used as a desiccant and deodorant in powder or paste form with glycerin.

Aluminii Aceto-Tartras, Ph. Ned.—*Syn.* Alsol.

In shining masses, soluble in water. An astringent and antiseptic employed in 1 or 2% solution as mouth

wash and gargle. Also for wound treatment the same strengh. **Alsol Liquid** is also prepared 50% strength.

Solubility.—We find that a solution as strong as 50% in water can be made with the commercial salt. Powder finely and allow to macerate a few hours with shaking. The salt is also soluble in Ammonium Acetate Solution ; not soluble to any extent in Glycerin.

For conjunctivitis.—B.M.J.E. ii./03,68.

Aluminii Chloridum, $Al_2Cl_6,12H_2O$ = 479·50 (483·092 I. Wts.). *Dose.*—2 to 4 grains (0·13 to 0·26 Gm.).

A white, amorphous deliquescent powder. Of distinct service in locomotor ataxy ; relieves the lightning pains. In tabes dorsalis is effective and may be combined with other drugs.—L. ii./99,1826 ; B.M.J. i./05,5.

Alumini Hydroxidum, U.S.

Prepared by pouring hot potash alum solution into a hot solution of Sodium Carbonate.

Pulvis pro Pedibus, P. Helv.

Potash Alum 15, Talc 85, in fine powder. For tender feet. Another useful form is **Foot Powder**: Talc 2, Boric Acid 2, Orris 1, Zinc Oleate Powder 1 *See also* Lysoform, *p.* 108.

Alumnol.

An aluminium salt of naphthol-sulphonic acid, in whitish powder. Very soluble in water ; also soluble in alcohol and glycerin. Lotion, and gargle, ointment ¼ to 2% in pharyngitis, rhinitis, ozœna, and gonorrhœa.

Aluminii Sulphocarbolas. $Al_2(C_6H_4OH.SO_3)_6$ = 1084·6 (1092·8 I. Wts.). *Syn.* Sozal.

A chocolate-coloured substance soluble 1 in 0·7 of water, and 1 in 20 of glycerin. A 1% injection has been employed in tubercular cystitis.

AMMONIUM.

NH_4 (*Hypothetical*) = 17·94 (18·072 (I. Wts.).

Experiments show that Ammonium Salts will give rise to convulsions by an action on the medulla.—Dixon.

Ammonii Bicarbonas. NH_4HCO_3 = 78·49 (79·08 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Is formed when ammonium carbonate effloresces in air. In minute white crystals, soluble 1 in 8 of water. As

a diffusible stimulant is less caustic in taste and more palatable than the official carbonate; is specially adapted for effervescing draughts in conjunction with citric acid.

Neuralgia relieved by.—B.M.J. i./03,195,289.

Ammonii Bromidum. (*Off.*) U.S., P. Austr.

$NH_4Br.=97{\cdot}29$ (98·032 I. Wts.).

Dose, 5 to 30 grains (0·32 to 2 Gm.).

Small colourless crystals readily soluble in water, less in alcohol. ***Incompatible*** with mineral acids and silver nitrate. Causes less depression than other bromides.

Inhalation of vapour of ammonium bromide beneficial in various forms of asthma.—L. i./90,1012, 1068.

Tablets, 5 grains (0·32 Gm.) and 10 gr. (0·64 Gm.).

Dose.—1 to 6 ormore.

Effervescent Ammonium Bromide.

Dose.—1 drachm. Contains 5 grains.

Pastilli Ammonii Bromidi. 1 grain in each with Glyco-gelatin basis. For whooping-cough, spasmodic affections of the throat, and loss of voice.

Trochisci Ammonii Bromidi with Gelatin basis, containing 1 grain each, are very useful sucked occasionally in asthma and for tickling cough.

Rubidium-Ammonium Bromide, *v.p.*635.

Ammonii Carbonas. (*Off.*). P. Austr.

$NH_4HCO_3 : NH_4NH_2.CO_2=156{\cdot}04$ (157·208 I.Wts.)

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

White crystalline masses with ammoniacal odour and alkaline taste consisting of ammonium hydrogen carbonate with ammonium carbamate. A stimulant, carminative and expectorant.

Soluble 1 in 4 water.

Incompatible with acids, iron salts and salts of alkaline earths.

Method of direct titration.—P.J. ii./05,864.

Ammonii Chloridum. (*Off.*) U.S., P. Austr.

$NH_4Cl=53{\cdot}13$ (53·522 I. Wts.)

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

White crystals soluble in 3 of water.

Liquid extract of liquorice disguises its nauseous taste.

Incompatible with carbonates of the alkalis and alkaline earth metals.

Inhalation of fumes with inflation of valves and

eustachian tube for non-suppurative middle ear disease.—B.M.J.—ii./04,1170.

Lotio Ammonii Chloridi, Gt. Orm. H.

Ammonium Chloride 15 grains, Methylated Spirit 1 drachm, Water to 1 ounce.

Tablets, 3 and 5 grains; also 3 gr. with Borax 2 grs.

Trochisci Ammonii Chloridi, T.H. These are marked M.A. Contain 2 grains of the salt in each, with black currant paste as a basis. One every 3 hours useful in congestion of the pharynx and larynx, loss of voice arising from cold and bronchial cough.

Trochisci Ammonii Chloridi cum Glycyrrhiza. Contain 3 grains of each.

Tablets are prepared containing Ammonium Chloride 3 grains and Liquorice Extract 3 grains.

Trochisci Ammonii Chloridi Compositi, T.H. Contain Ammonium Chloride 1 gr., Potassium Chlorate 2 grs., and ¼ gr. approximately of Cubebs.

Vapor Ammonii Chloridi is used in affections of the throat and Eustachian tube. Produced by air being drawn through hydrochloric acid and ammonia in a suitable apparatus and purified by passing through water or a moist sponge.

Inhalers, Ammonium Chloride. — Godfrey's, Basdon's, and Maw's are varieties on the market. They are all the same in principle, which consists in combining the vapour of ammonia and hydrochloric acid.

Ammonii Iodidum, U.S. $NH_4I = 143{\cdot}84$ (145·042 I. Wts.). *Average dose*, 4 grains (0·25 Gm.).

A white granular salt containing not less than 97% pure ammonium iodide in minute crystalline cubes, very deliquescent and soon becoming yellow or yellowish-brown on exposure to air; odourless when white, with a sharp saline taste and a neutral reaction. Soluble 1 in 1 of Water, 1 in 3 of 90% Alcohol. Should be kept from light and air, or free iodine is quickly liberated. It causes less depression than potassium iodide, and is preferred for syphilis and rheumatism.

Ammonii Nitras. $NH_4NO_3 = 79{\cdot}52$ (80·112 I. Wts.). B.P. 1885.

The fused salt is used for the production of **Nitrous Oxide** $N_2O = 43{\cdot}76$ (44·08 I. Wts.); on heating to 350° F. it splits up into this gas and water vapour.

Death under nitrous oxide.—L. i./99,959; B.M.J. i./99,850. Comments on same.—L. i./99,1053. Another death.—B.M.J. ii./04,1635. The safest of anæsthetics. The heart is not directly affected.—Dixon.

Instructions for treatment if dangerous symptoms arise during administration of nitrous oxide.

Dangers arising under gas are almost invariably due to failure of the respiration caused either by obstruction or overdose. Obstruction may result from "falling back of the tongue," from pressure due to engorgement of the thyroid or thymus, or other glands in the neck, or from foreign bodies entering the respiratory passages—teeth, bloodclot, vomit, &c. Symptoms of over-dose are more likely to occur if the patient's clothing be not loose.

If the breathing stop, give no more anæsthetic, clear the mouth and pharynx with a swab or towel round the finger, pull forward the tongue and compress the lower ribs; if no air enter or leave the chest, place the patient upon his side upon the floor, with a pillow or something equivalent under his shoulders. Loosen his clothing, pull the tongue forward and give the tongue forceps to an assistant to keep up the traction. Try to expel any possible obstruction by compressing the lower ribs and abdomen, and then turn the patient upon his back and begin artificial respiration, giving oxygen gas and applying nitrite of amyl or weak ammonia vapour to the nostrils meanwhile. If there be another assistant tell him to give a hypodermic injection of strychnine (Gr. $\frac{1}{30}$) or 1 drachm of ether or both, but do not stop the artificial respiration or waste time over the injection yourself. If no air enter or leave the chest during the artificial respiration, do tracheotomy forthwith, and immediately the trachea is entered resume the artificial respiration and continue it for at least an hour, keeping the patient warm during this time.—R. D. H.

Ammonii Valerianas. Ammonii Valeras, U.S. $NH_4.C_5H_9O_2 = 118{\cdot}25$ (119·144 I. Wts.) Another formula: $NH_4.C_5H_9O_2 + 2C_5H_{10}O_2 = 320{\cdot}87$ (323·304 I. Wts.).

Dose.—1 to 8 grains (0·065 to 0·52 Gm.). In masses of flat colourless deliquescent crystals, with a strong valerian odour, very soluble in water and alcohol. A 25% aqueous solution is prepared for dispensing. *Valérianate d'Ammoniaque Liquide* (Pierlot), a French specialty, is Valerianic Acid 3, Ammonium Carbonate *q.s.* to neutralise, Extract of Valerian 2, Water 95. *Dose.*—2 to 4 drachms (7 to 15 Cc.).

Linimentum Ammoniæ (*Off.*).

Solution of Ammonia 1, Almond Oil 1, Olive Oil 2.

Shake together. 'Hartshorn and Oil' is usually Solution of Ammonia 1 and Almond Oil 3. Shake together.

U.S. has Ammonia Water 35, Alcohol 5, Cotton Seed Oil 57, Oleic Acid 3. Other formulæ :—

Sesame Oil 60, Castor Oil 20, Ammonia Solution, 20. This forms a thick liniment.

Sesame Oil 50, Castor Oil 30, Ammonia Solution 20. This is thinner, and either are miscible with chloroform equal volumes, and with turpentine in the proportion of 1 to 5.—B. & C.D. ii./04,261.

Liquor Ammoniæ (*Off.*—Sp. Gr. 0·959), 'Ammonia,' P. Austr.; 'Ammonia Liquida,' Ph. Ned., Sp. Gr. 0·960. Aqua Ammoniæ, U.S., contains 10% by weight of NH_3.

Dose.—10 to 20 minims (0·6 to 1·2 Cc.).—(Not official.) *Average dose* 15 minims (U.S.).

Hypodermic injections of 2 to 6 minims for collapse; or up to 36 minims for snake poisoning, equal to 12 minims of the stronger liquor.

Cobra snake bite, patient recovered after hypodermic injections of 15 minims of the strong liquor diluted with an equal amount of water.—Pr.xl.291.

Liquor Ammoniæ Fortis (*Off.*), Sp. Gr. 0·891.

Dose.—3 to 6 minims (0·18 to 0·35 Cc.).

Contains 32·5% by weight NH_3. (Aqua Ammoniæ Fortior, U.S., contains 28%.)

If of Sp. Gr. 0·88, is about 2·6% stronger.

Liquor Ammoniæ Domesticus, Household Ammonia.

Oleic Acid 1, Rectified Spirit 1, mix and add Strong Solution of Ammonia 7, Distilled Water 7; shake well. For use diluted as a detergent of the skin. In the bath 1 in 1,000 to 2,000 softens the water; also for general domestic purposes.

Hair Lotion, Erasmus Wilson's.

Strong solution of Ammonia 1, Almond Oil 1, Spirit of Rosemary (B.P. 1885) 4, Honey Water 2.

For alopecia areata Strong Ammonia Solution 1, Chloroform 1, Olive Oil 1, Spirit of Rosemary to 8 is useful.

Liquor Ammonii Acetatis Fortior. B.P. 1885.

Dose.—25 to 75 minims (1·5 to 4·5 Cc.). 1 with distilled water *q.s.* to 5 forms :—

Liquor Ammonii Acetatis (*Off.*).

Dose.—2 to 6 drachms (7 to 21 Cc.). Keep in green glass bottles.

The method of neutralising a definite quantity of acetic acid with ammonium carbonate is recommended, and sp. gr. should be included.—C.D. i./06,110. The neutral point is found by trying effect on a little ammonium carbonate on a watch glass.

U.S. is similar and contains not less than 7% Ammonium Acetate [CH_3COONH_4]=76·51 (U.S. Wts.). **Ammonium Aceticum Solutum, P. Austr.**, contains 15%.

Incompatible with mineral acids, alkaline carbonates, potassium chlorate and dichromate, mercurous nitrate.

Serviceable in all fevers and delirium tremens, one drachm every hour at first, reduced gradually.

Mistura Febrifuga, N.H.W. Solution of Ammonium Acetate 2 drachms, Spirit of Nitre 20 minims, Sodium Bicarbonate 5 grains, Chloroform Water to $\frac{1}{2}$ ounce.

Liquor Ammonii Citratis Fortior, B.P. 1885.

Dose.—30 to 90 minims (1·8 to 5·3 Cc.).

One part to three of distilled water forms

Liquor Ammonii Citratis (*Off.*).

Dose.—2 to 6 drachms (7 to 21 Cc.).

This preparation is of the same strength as before, but is now officially directed to be prepared by neutralising Citric Acid 1, with Ammonium Carbonate in Distilled Water *q.s.* to 8. *See* **Liquor Ammonii Acetatis** above.

Spiritus Ammoniæ Fetidus (*Off.*). Asafœtida 75, Strong Solution of Ammonia 100, Alcohol 90% to 1,000. **Spiritus Ammoniæ, U.S.** *Average Dose.*—15 minims. A solution in alcohol 90%.

Contains not less than 10% gaseous ammonia by weight.

Spiritus Ammoniæ Aromaticus (*Off.*).

Contains approximately 2·4% by volume. That of U.S. contains approximately 4% and is not distilled.

Tinctura Ammoniæ Composita, P.L.—*Syn.* Eau de Luce.

Mastiche 2 drachms, Rectified Spirit 9 drachms, Oil of Lavender 14 minims; macerate, decant, and add Stronger Solution of Ammonia 20 ounces. Topically relieves bites of insects.

AMYGDALA AMARA.

(*Rosaceæ.*)

Bitter Almond. (*Off.*).

Oleum Amygdalæ (*Off.*) is expressed from the seeds (Peach or Apricot kernel Oils, or mixtures are sold commercially as Oleum Amygdalæ Persicæ*), which yield about 40%, and the residue is utilised for the production of Essential Oil of Bitter Almonds (**Benzaldehyde**, $C_6H_5COH = 105{\cdot}25$ (106·048 I. Wts.), or Oleum Amygdalæ Essentiale *sine* Acido Hydrocyanico). **Benzaldehyde** is official in U.S. *Dose.*—½ minim (**0·03 Cc.**). Produced artificially or as above, containing not less than 85% of benzaldehyde. Sp. Gr. 1·045 at 25° C. B. Pt., 179° to 180° C. Tests for hydrocyanic acid and chlorinated products and assay process are given in U.S. Is a flavouring agent—non-poisonous. The Essential Oil containing the Hydrocyanic Acid to the extent of about 5% is also prepared and must be carefully distinguished from this. (That ordered by U.S. contains not less than 2 or more than 4%). The glucoside **Amygdalin**, $C_{20}H_{27}NO_{11},3H_2O = 507{\cdot}46$ (511·304 I. Wts.)—odourless crystals soluble in 12 parts of water with slightly bitter taste and neutral action—under the influence of **Emulsin**, also a constituent in the seeds, of the nature of a ferment, hydrolyses (takes up water) on coming in contact with it, forming grape sugar and Benzaldehyde-hydrocyanic Acid, $C_6H_5COH + HCN = 132{\cdot}1$ (133·096 I. Wts.) This latter compound is decomposed and the Hydrocyanic Acid is removed so as to produce the above Essential Oil suitable for flavouring purposes. A similar body to Amygdalin, or one identical with it, is contained in *Prunus laurocerasus* (Cherry Laurel leaves). Aqua Laurocerasi is standardised (*Off.* and C.U.D.) to contain 0·1% Hydrocyanic Acid. It also contains some Benzaldehyde; Aqua Amygdalæ Amaræ should contain the same proportion of Hydrocyanic Acid.—C.U.D. (U.S. is 1 of oil of bitter almonds

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*Is now from apricot (*Prunus armeniaca*) kernels. Suggested to alter name to one derived from that of the apricot.—C.D., Feb. ii./05.

No pharmacological difference between this oil and the expressed oil of almonds, but therapeutically distinction essential.—P.J. i./05, 81.

shaken in 1,000 of water and filtered.) *Average dose.*—1 drachm.

Amygdalin is also contained in the bark of *Prunus serotina* (Virginian Prune or Wild Cherry bark), and the same occurs when this drug is bruised with water.

Solubility.—Almond oil dissolves in all proportions in chloroform, about 1 in $2\frac{1}{2}$ of ether and slightly in alcohol 90%.

Spiritus Amygdalæ Amaræ, U.S. *Average dose.*—8 minims. Oil of Bitter Almond 1, Alcohol 80, Distilled Water to 100.

Nitrobenzene, $C_6H_5NO_2 = 122{\cdot}16$ (123·08 I.Wts.), "Oil of Mirbane," has an odour similar to Benzaldehyde, and is used in cheap perfumery; it is a dangerous poison used in sweatmeats. Death from.—L. i./06,986. Another case of poisoning by a mouthful. Copper sulphate given as emetic, further treatment: Calomel and Bismuth. Recovery.—L. i./06,1242.

It is a powerful narcotic poison, fatal dose being about 1 Gm. Case of poisoning by boot blacking containing a proportion.—L. ii./04,1439.

Poisoning by 2 mouthfuls, taken in mistake for whisky, treated hypodermically by strychnine and brandy. Death.—L. i./06,88.

Uses of Almond Oil.—For purposes identical with those of olive oil, *q.v.* It may be dropped into the eye when the cornea is injured.

Amygdala Dulcis also yields about the same amount of Oleum Amygdalæ (*Off.*) and contains Emulsin, but is free from Amygdalin.

Pulvis Amygdalæ Compositus (*Off.*). — Sweet Almonds powdered (*s.a.*) 8, Refined Sugar 4, Powdered Gum Acacia 1.

Mistura Amygdalæ (*Off.*) contains of this Powder 1, Water 8, rubbed smooth and strained.

Emulsum Amygdalæ, U.S.—*Average dose* 4 ounces. Sweet Almonds 60, Acacia Powder 10, Sugar 30, Water *q.s.* to 1,000.

Sterilised Olive (Oleum Asepticum, L.H.), or **Almond Oil,** or **Liquid Paraffin**, intended for hypodermic injection (Olive Oil for subcutaneous feeding L.H.), or lubricating catheters, is prepared by sterilising the oil in small flasks or bottles tightly plugged with cotton wool at 120° — 140° C. for $\frac{1}{2}$ hour.

Physicians should specify carefully which oil is to be employed for "Sterilised Oil."

AMYL NITRIS (*Off.*).

Amylis Nitris, U.S. Ph. Ned., 80% pure.
AMYLIUM NITROSUM, P. Austr. P. Belg.
$C_5H_{11}NO_2 = 116{\cdot}25$ (117·128 I. Wts.).

Dose.—By inhalation, the vapour of 2 to 5 minims (0·12 to 0·3 Cc.). By the mouth, ½ to 1 minim (0·03 to 0·06 Cc.).

A yellowish ethereal liquid with a peculiar not disagreeable odour; produced by the action of nitrous acid on fractionated amylic alcohol and consisting chiefly of iso-amyl nitrite.—Sp. Gr. 0·870 to 0·880; about 70% distils between 194° to 212° F.—it is difficult to obtain uniform (*v.p.* 125); soluble in alcohol, insoluble in water. Should be kept cool; by exposure to the air it becomes comparatively inert. Tested by means of Allen's Nitrometer, a 5% solution in alcohol should yield not less than six times its volume of nitric oxide gas.

Incompatible.—Alkaline Carbonates, Potassium Iodide, Bromides and Ferrous Salts.

U.S. directs to be kept in hermetically sealed glass bulbs or in dark amber coloured, glass stoppered vials in a cool and dark place. To contain not less than 80% of amyl nitrite.

One or two Public Institutions employ a drop bottle in place of capsules; but this cannot be recommended.

Amyl nitrite dilates the vessels and lowers blood-pressure. In 30 to 40 seconds after inhaling or swallowing a dose it flushes the face, and increases the heat and perspiration of the head and neck.

Uses.—It has been successful in relieving angina pectoris, sea-sickness, ague, spasmodic asthma, migraine, neuralgic dysmenorrhœa, post-partum hæmorrhage, tetanus, as an antidote to chloroform, to ward off epileptic attacks, and for the spasm of false croup and whooping-cough, and in cocaine and strychnine poisoning. Is largely employed in threatened fainting and collapse, and as a restorative after gas in dental extractions.

Dixon draws attention to the fact that the nitrites owe their activity to the O – N=O group. Nitropentane—with the same additive composition as amyl nitrite, *i.e.*, $C_5H_{11}NO_2$—structurally taken to be $C_5H_{11}N<\begin{matrix}O\\|\\O\end{matrix}$ is without action.

Capsules of Amyl Nitrite.

Encased in cotton wool and silk; 1, 2, 3, 4, 5, 6, or 10 minims.

In use the glass capsule is broken, the liquid soaks the cotton wool and silk cover, and can be inhaled most conveniently. The 3-minim size meets most wants.

Mistura Amyl Nitritis.

Amyl Nitrite 2, Alcohol (90%) 16. Mix and add to Powdered Tragacanth 1 (contained in a dry phial). Then add gradually Distilled Water, to 240. Shake well. *Dose.*—1 or 2 drachms (3·5 to 7 Cc.).

Amyl Nitrite and Pilocarpine Hair Lotion.

Amyl Nitrite 2 drachms, Pilocarpine Nitrate 3 grains, Glycerin 1½ ounces, Tincture of Cantharides 3 drachms, Eucalyptus Oil ½ drachm. To be rubbed into the scalp alternate nights.

Hæmoptysis arrested in every case in which Amyl Nitrite was tried, whether of mitral obstruction or from phthisis. Normally the effusion of blood irritates the lung tissue, causing coughing. The strain raises the blood pressure, inducing fresh bleeding. A vicious circle is in this way maintained till eventually the loss of blood becomes so great, that the exertion of coughing no longer causes a marked rise of pressure, then the bleeding ceases. Amyl Nitrite accomplishes same effect without further loss of blood.—Edin. Med. J. July, 1904; L. ii./04,522,942,1446; M.A.1906,240; B.M J.E.i./06,79. In severe hæmoptysis—rupture of an atheromatous pulmonary vessel—free use satisfactory.—B.M.J. i./06,917.

Angina pectoris gravior. The more pronounced attacks were treated with Amyl Nitrite and Nitro-Glycerin, which gave prompt relief.—B.M.J. i./06,304.

In chloroform syncope, Amyl Nitrite affords the quickest means of restoring the heart's action; and the capsules are the most convenient form of using it.

For the treatment of angina pectoris 5 drops inhaled; the physiological action occurs in 30 to 60 seconds.

In ague, on the onset of the cold stage, 5 minims inhaled cuts short the attack and checks the recurrence of the paroxysms.

As an antidote to chloroform syncope, 3 minims inhaled.—L. ii./91,463; B.M.J. ii./88,179.

Is very useful in sea-sickness, 3 drops (from a glass capsule) should be inhaled and repeated every 2 or 3 hours if necessary, or the mixture (*p.* 124) taken.

In post-partum hæmorrhage, 5 minims inhaled will restore patient from collapse.

Secondary hæmorrhage and extra-uterine gestation.—L. ii./05,1107.

In diseases of optic nerve, good results.—M.A. 1906, 344.

To restore animation a dose should be given in doubtful cases of death, as from fainting or drowning.

In tetanus inhale a dose in every spasmodic seizure to gain time.—L. i./98,103.

Infantile convulsions are well treated by inhalation from 1 minim capsules.—Clinical Jl. Dec. 3, 1902.

Is a powerful agent to relax uterine spasms and hour-glass contraction, whether natural or caused by ergot.

In uræmic asthma, Nitrite of Amyl capsules found useful.—B.M.J. i./83,811,956,1064,1115.

In puerperal eclampsia, excretion of uric acid largely increased under its use.—Pr. xxxiv.50.

Successful use in epilepsy, controlling the fits and preventing insensibility.—B.M.J. ii./89,599,688.

The best remedy in angina pectoris; patient's mind relieved by small doses of morphine, combined with the nitrite.—L. i./90, 240. Brunton.—L. ii./05,325. In angina no drug can compare with amyl nitrite for immediate action and efficiency.—L. ii./05,812; L. i./98,837; B.M.J. i./98,808. In paroxysmal tachycardia. —B.M.J. ii/04,109.

In hæmoptysis, the general widespread vasodilation produced by amyl nitrite is preferable to the vasoconstriction effected by adrenalin internally.—L.ii./04,1446.

Research on composition; commercial amyl nitrite shown to contain an α- and a β-amyl nitrite, as well as **Isobutyl Nitrite**, $(CH_3)_2CH.CH_2NO_2 = 102{\cdot}34$ (103·112 I. Wts.). This, when pure, is found prompt in action on blood-pressure, pulse-rate, and respiration, and may be used as a substitute for amyl nitrite for inhalation.—P.J. 1888,485; B.M.J. ii./88,1407; Y.B. 1890,308; Pr. xlvii.259.

Capsules of Isobutyl Nitrite. Encased in

cotton wool and silk, contain 3 minims, and are used for the relief of spasmodic affections.

Amyl Nitrate. $C_5H_{11}NO_3 = 132{\cdot}13$ (133·128 I.Wts.)

Colourless liquid, Sp. Gr. 0·999. Not used to any extent in medicine.

AMYLENI HYDRAS. P.G.

$(CH_3)_2 : C(OH)C_2H_5 = 87{\cdot}43$ (88·096 I. Wts.).

Syn. DIMETHYL-ETHYL CARBINOL, TERTIARY AMYL ALCOHOL. *Dose.*—30 to 80 minims (1·8 to 4·7 Cc.), flavoured with liquorice.

A colourless liquid, of pungent taste and odour, resembling a mixture of paraldehyde and camphor. Soluble in 8 parts of water, also in alcohol. Sp. gr. 0·815 to 0·820, boiling point 216°F. It is a hypnotic, occupying a position between chloral and paraldehyde.

Capsules contain 10 minims in each. *Dose.*—3 to 6.

Amylene-Chloral, $CCl_3.CHOH.O.(CH_3)_2C_2H_5 =$ 221·79 (223·454 I.Wts.).—*Syn.* DORMIOL; DIMETHYL-ETHYLCARBINOL-CHLORAL.

Dose.—5 to 50 minims (0·3 to 3 Cc.).

Produced by the action of amylene hydrate on chloral.

An oily liquid with hypnotic properties. A 50% solution is supplied commercially; best administered in a 2-ounce draught with Syrup of Tolu or liquid extract of liquorice.—P.J. ii./99,135.

A peaceful sleep of 4 to 7 hours follows its use in insomnia, melancholia and hypochondriasis.

Capsules contain 7½ minims (0·5 Gm.) pure Dormiol.

ANTIMONIUM.

Sb=119·00 (120·2 I. Wts.)

Antimonii Chloridum, $SbCl_3 = 224{\cdot}57$ (226·55 I. Wts.).

In colourless crystals, known as butter of antimony. It is very corrosive; on addition to water, it decomposes into free hydrochloric acid and basic antimony oxychloride, powder of Algaroth; but is soluble in alcohol and carbon bisulphide.

Liquor Antimonii Chloridi.

A heavy caustic liquid of a yellowish red colour; Sp. Gr. 1·47. It is coloured by impurity, ferric

chloride often added intentionally. It can be obtained colourless. Antimony chloride is a useful caustic.

Antimonium Sulphuratum (*Off.*). KERMES MINERALE, P. Belg. A mixture of the sulphides and oxides in orange red powder. **Tabellæ, P. Belg.**, contain 0·01 Gm.

Dose.—1 to 2 grains. ***Incompatible*** with sodium bicarbonate and potassium acid tartrate.

Antimonium Nigrum Purificatum (*Off.*)

Sb_2S_3=333·46 (336·58 I. Wts.)

Greyish black crystalline powder decomposed by boiling hydrochloric acid.

Antimonium Tartaratum. (*Off.*).

$[K(SbO)C_4H_4O_6]_2,H_2O$=659·14 (664·781 I. Wts).

Dose.—Diaphoretic $\frac{1}{24}$ to $\frac{1}{8}$ grain, emetic 1 to 2 grains.

Colourless crystals made by combining Antimonious Oxide with Acid Potassium Tartrate.

Soluble in 17 of cold water. Almost insoluble in alcohol 90%. ***Incompatible*** with acids and alkalis, soap, and tannin. ***Uses.***—Diaphoretic and emetic.

In chorea in children is less dangerous as emetic than apomorphine.—M.A. 1906,155.

Antidotes.—Stomach tube, emetics, tannin, or tea, stimulants.

Unguentum Antimonii Tartarati, B.P. '85. 1 in 5 of Unguentum Simplex.

For lumbago rub the painful part with this ointment until pustules characteristic of antimony appear. A saline aperient containing sodium salicylate simultaneously effective.—B.M.J. i./06,81.

Vinum Antimoniale. (*Off.*).

Dose.—10 to 30 minims (0·6 to 1·8 Cc.); as emetic 2 to 4 drachms (7 to 15 Cc.); contains 1 grain in 240 minims.

Tartarated Antimony 40 grains, boiling Distilled Water 1 ounce, Sherry to 20 ounces.

APIOL.

Dose.—3 to 6 minims (0·18 to 0·35 Cc.), in Perles, 3 minims in each, or Capsules 3, 5, and 10 minims.

A liquid preparation obtained from, and containing the active properties of, the fruit of *Apium Petroselinum*, common parsley. It is usually a transparent green fluid,

but is also met with as a dark oily liquid, with a peculiar odour and a pungent taste like parsley. It dissolves readily in alcohol and ether.

It has decided efficacy in primary amenorrhœa or deficiency of secretion, as well as in accidental suppression and in dysmenorrhœa. A perle should be given night and morning for 4 or 5 days during the epoch.

Apioline Capsules are of French manufacture—are advocated for regulating and relieving difficult and painful menstruation.

Apiol, Crystallised.

$C_{12}H_{14}O_4 = 220{\cdot}44$ (222·112 I. Wts.).

A stearoptene in light, colourless, acicular crystals, only slightly soluble in water, but soluble in ether, alcohol, and oils. Has been employed as a substitute for quinine in malaria and in dysmenorrhœa. For amenorrhœa a sterilised solution in olive oil containing 3 grains (0·2 Gm.) in 17 minims (1 Cc.) has been given—injected once daily for some days before the period.—M. 1901,42.

Capsules of Apiol and Ergotin.

Contain Apiol 5 minims (0·3 Cc.) and Ergotin 2 grains (0·13 Gm.).

Ergoapiol. Under this name capsules are supplied for amenorrhœa, dysmenorrhœa and allied troubles.

APOCYNUM, U.S.

American Indian Hemp Root.—*Syn.* Apocynum Cannabinum, Canadian Hemp.

Average Dose (of root in powder) 15 grains (1 Gm.).

Tinctura Apocyni. 1 in 10 of proof spirit.

Dose.—5 to 60 minims (0·3 to 3·5 Cc.).

Uses.—A powerful emetic, diaphoretic, cathartic, anthelmintic, and diuretic, is useful in cardiac dropsy and Bright's disease.—L. ii./04,859,

Uræmia is warded off by the profuse diuresis it produces and it is very valuable in removing pleuritic effusion.

Decoctum Apocyni 1 in 60. *Dose.*—½ to 1 ounce.

Fluidextractum Apocyni, U.S.

Average Dose.—15 minims (1 Cc.). 1=1 glycero-hydro alcoholic. Useful in dilatation of heart, mitral, and other valvular lesions.—L. ii./05,955.

APOMORPHINÆ HYDROCHLORIDUM.

Apomorphine Hydrochloride (*Off.*) U.S. P. Austr.

$C_{17}H_{17}NO_2,HCl = 301{\cdot}36$ (303·634 I. Wts.).

Dose.—$\frac{1}{32}$ to $\frac{1}{16}$ grain (0·002 to 0·004 Gm.), increased, as an expectorant; $\frac{1}{12}$ to $\frac{1}{4}$ grain (0·0054 to 0·016 Gm.) as an emetic; $\frac{1}{25}$ to $\frac{1}{6}$ grain (0·0026 to 0·01 Gm.) hypodermically.

A derivative of morphine or codeine obtained by heating them with an excess of hydrochloric acid in sealed tubes. Apomorphine is morphine deprived of a molecule of water. In commerce the hydrochloride occurs in minute pale greyish-white, acicular crystals.

Soluble.—1 in 60 of water, 1 in 51 of alcohol 90% ; the solution turns emerald-green in colour, but loses little of its medicinal powers. This discoloration is said to be due to the action of free ammonia in the air. Insoluble in ether and chloroform.

Incompatible with sodium carbonate and bicarbonate, tannin and iron salts.

Uses.—It acts as a non-irritant emetic and anti-stimulant; in bronchial asthma doses of $\frac{1}{6}$ grain are very useful. Small doses are expectorant and relieve bronchitis. May be given as—

Tabellæ Apomorphinæ, $\frac{1}{50}$ grain (0·0013 Gm.) in each, with chocolate. G. H. contain $\frac{1}{30}$ grain.

Tablets, Compressed, contain $\frac{1}{50}$ and $\frac{1}{100}$ grain.

Injectio Apomorphinæ Hypodermica. (*Off.*).

Apomorphine Hydrochloride 1, Diluted Hydrochloric Acid 1, Distilled Water to 100. *Dose.*—5 to 10 minims (or more) as an emetic. The addition of a trace of acid keeps it stable and colourless.

This injection is a useful hypnotic for epileptics; and for cases of puerperal convulsions it soon causes vomiting and free perspiration, patient sleeps and awakes quiet.

Hypodermic Tablets are prepared containing $\frac{1}{25}$, $\frac{1}{15}$ and $\frac{1}{10}$ grain in each.

Mistura Apomorphinæ et Terebeni, G.H.

Dose.—1 ounce. Apomorphine Hydrochloride $\frac{1}{10}$ grain, Terebene 15 minims, Balsam of Peru 10 minims, Mucilage Mixture* to 1 ounce.

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* **Mistura Mucilaginosa, G.H.** Mucilage of Gum Acacia 2 drachms, Syrup 30 minims, Water to 1 ounce.

Syrupus Apomorphinæ Hydrochloridi, B.P.C.

Apomorphine Hydrochloride 5 grains, Diluted Hydrochloric Acid 15 minims, Rectified Spirit 7 drachms, Distilled Water 7 drachms, Syrup to 20 ounces.

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

Apomorphine invariably produces vomiting by a single dose, $\frac{1}{5}$ grain by the mouth or $\frac{1}{10}$-grain hypodermically. The vomiting seems to put an end to itself; there is no subsequent nausea, nor is it followed or accompanied by any ill effects.

Is of great value as an emetic in all cases of poisoning.

In a case of obstruction of the œsophagus by a plum-stone, the injection of Apomorphine hypodermically caused vomiting and its removal.

As an expectorant $\frac{1}{20}$ grain every 2 hours is useful, or, given with the same quantity of morphine every 2 or 4 hours, it lessens cough and increases fluidity of sputa.

In pertussis Apomorphine is given with good effect.

As a hypnotic, most effective. Hypodermic dose—$\frac{1}{30}$ grain, repeated in half-an-hour if first injection should fail. Not more than $\frac{1}{10}$ grain should be given in hysteria, insomnia and neuralgias.—Therap. 1900,202.

In alcoholism it acts as a sedative and does not cause vomiting.—L. i./00,1481,1635; B.M.J. ii./00,1375.

Apocodeinæ Hydrochloridum.

$C_{18}H_{19}NO_2.HCl = 315·27$ (317·650 I.Wts.)

Dose.—$\frac{1}{10}$, gradually increased to 1 grain (0·0065 to 0·065 Gm.). A greyish powder freely soluble in water.

A good expectorant hypodermically. Solution must be neutral; dose up to 25 minims of 2% solution. Internally, 10 to 30 minims of 1% solution caused no nausea or vomiting, but produced free expectoration. In pill 3 or 4 grains daily may be safely given.—B.M.J. i./91,455; P.J. 1891,878.

Is a sialagogue, and increases peristalsis; not emetic, but a sedative suitable for children.—Lyon Médicale, 1893, xxi.69; xxiii.145.

As **Hypodermic Purgative.**—

A dose of 30 minims (1·8 Cc.), of a 1% solution produced purgation in half an hour without vomiting.—B.M.J. ii./02,1247. This and Colocynthin however have acted as emetics.—Gowers.

ARGENTUM.

Ag = 107·11 (107·93 I. Wts.).

Silver Leaf, Sterilised. ARGENTUM FOLIATUM, P. Austr.

Is employed for placing over wounds to assist their healing beneath plain sterilised or medicated Gauze.—B.M.J. i./04,541 ; for coating pills, *v.* Pilulæ.

Argenti Acetas.

$CH_3COO\,Ag$ = 165·69 (166·954 I. Wts.).

In white crystals, freely soluble in water. A 1 per cent. solution has been suggested in place of silver nitrate for infantile suppuration of the conjunctivæ of the eyes, as being not so irritant. Dilute Sodium Chloride Lotion may be used after it.—M. 1901,44.

Argenti Citras.—*Syn.* ITROL.

$C_3H_4.OH.(COOAg)_3$ = 508·95 (512·830 I. Wts.).

A white, odourless non-caustic powder, soluble about 1 in 4,000 of water. Is recommended in Crédé's treatment as an antiseptic for wounds, in lotion, ointment, or powder.—P.J. i./96,243; Pr. lx. 292. In acute gonorrhœa aqueous injection 1 in 8,000 several times a day.

Argenti Cyanidum, U.S.

AgCN = 132·96 (*Off.* and U.S. Wts.) (133·97 I. Wts.).

Dose $\frac{1}{60}$ to $\frac{1}{20}$ grain (0·001 to 0·003 Gm.). (U.S. gives no dose.)

White powder containing 80·48% Ag.

Used for producing extemporaneously Acidum Hydrocyanicum Dilutum (U.S.) by treatment with dilute Hydrochloric Acid.

Pilula Argenti Cyanidi contains $\frac{1}{60}$ grain.

Argenti Fluoridum, Ag F = 126·93 (I. Wts.).

Syn. Tachiol.

In yellowish brown deliquescent masses. It is soluble 1 in less than 2 of water, and about 1 in 3 of alcohol 90%. It is a powerful non-toxic bactericide For general surgical purposes solutions are employed of strength 1 in 100 to 1 in 1,000. The most resistant pyogenic organisms are said to be killed in less than a minute by a solution as dilute as 1 in 150,000. 1 in 200,000 solution was fatal to *B. typhi abdominalis* in the

same time. The substance coagulates albuminoids only slightly.—P.J. ii./02, 273; L. i./02,393; ii./02,1707.

It blackens linen with which it comes in contact. In cystitis, urethritis, and similar affections the strength of the solution may be 1 in 5,000 or 1 in 1,000, as a slight caustic may be increased to 1 in 100.

Has been suggested to sterilise water 1 in 500 strength. On standing 24 hours the salt is deposited, and not more than 1 mgr. per litre of silver remains.—C.D. ii./05,1052.

As a gastric antiseptic.—B.M.J.E. i./50, 24.

Argenti Iodidum Recentum. Ag I = 233·01 (234·90 I. Wts.).

In the freshly precipitated form this salt has been used in cases of ophthalmia, especially those arising from cold.

Also advocated in emulsion for use in urethritis and other similar conditions. The nascent silver iodide in 3% suspension may be produced from silver nitrate 2·2 Gm., potassium iodide 2·2 Gm., distilled water 50 Cc, mucilage of Irish moss N.F. to 100 Cc. The degree of fineness of the precipitate is photographically of importance, so also by analogy therapeutically. To produce a coarse precipitate the salts are separately dissolved in 5 Cc. of the water shaken and diluted with the mucilage. For a light flocculent precipitate dissolve each in 50 Cc. of water.—Am. Jl. Ph., Feb. 06, 64.

Argenti Lactas. *Syn.* Actol.

$CH_3.CHOH.COOAg,H_2O$ = 213·36 (214·986 I. Wts.).

Dose.—$\frac{1}{6}$ grain (0·01 Gm.).

A whitish odourless powder, soluble 1 in 160 of water, recommended in solution 1 in 200 to 1,000 as an antiseptic for surgical use and for rendering aseptic ligatures and drainage tubes. Lotions and gargles 1 in 500 are used. Is slightly soluble in alcohol 90%. Being more soluble is more irritating than silver citrate. Statements appear to the effect that this salt is soluble 1 in 15 of water, but our experiments do not confirm this.

For gonorrhœa.—B.M.J.E. i./99,99.

For chronic abscesses at the roots of the teeth fresh hypodermic injections of Actol 1 : 500.—P.J. ii./00,703.

Argenti Nitras. $AgNO_3$ = 168·69 (169·97 I. Wts.) (*Off.*). P. Austr. *Syn.* Lunar Caustic.

Dose.—$\frac{1}{4}$ to $\frac{1}{2}$ grain (0·016 to 0·032 Gm.) in a pill best with kaolin ointment as an excipient—*not* with bread crumb,—this contains common salt, which decomposes it.

Incompatible with organic material, *e.g.*, rose water, if used instead of distilled water for preparing a lotion or pigment; also with Tartaric Acid, Hydrocyanic Acid, Iodine, Potassium Iodide and Bromide.

Soluble 1 in 0·53 of water (P.J. ii./03,881) and 1 in 20 of alcohol 90%.

Uses.—Internally for epilepsy, but has been discontinued because long administration causes staining of the skin. Checks diarrhœa of children. In typhoid where there is hæmorrhage $\frac{1}{6}$ grain every 3, 4 or 6 hours, or even as often as every 2 hours.—Med. News, July 23, 1904. Rectal injections are also useful for the bleeding of dysentery. In laryngeal phthisis a spray $\frac{1}{4}$ to 2 grains to the ounce.—H.

In uterine ulceration and leucorrhœa, where the cervix is boggy and tender the fused sticks are employed.

Pigments, containing from 10 to 60 grains to the ounce of water are used for the throat, and applied to ulcers as a stimulant. Lotions, eye-drops and solutions for urethral injections vary from 1 in 1,000 to 1 in 100.

Crédé recommended that a drop of a 2% solution should be dropped into the eyes at birth to avoid risk of purulent ophthalmia.

Injections of weak solution into the bladder useful in cystitis.—B.M.J.E. ii./92,38.

Gonorrhœa treated by solution of nitrate of silver (10 grains to the ounce), applied on a mop of cotton wool to the inflamed part of urethra through an endoscopic tube.—L.i./92,461. Cocaine nitrate (not hydrochloride) may be added.

Antidote to Silver Nitrate.—Common salt, given in some demulcent drink (excess should be avoided as it is very irritant to the stomach). Salt is also used to arrest its action locally as a caustic. The pain caused by application of solutions of silver nitrate may be alleviated by previous application of a solution of cocaine nitrate.

Mitigated Silver Nitrate is prepared of various strengths by fusing together silver nitrate 1 to 1 (P.Jap.), 1 to 2, or 1 to 3 of potassium nitrate, for the use of oculists and surgeons.

The fused mixture of 1 part with 2 of potassium nitrate is official as **Mitigated Caustic**, or **Argenti Nitras Mitigatus** (*Off.*). U.S. P. Austr.

Argenti Nitras Fusus. U.S. P. Austr. Contains 94·8% of Silver.

Silver Nitrate 100 Gm., Hydrochloric Acid 4 Gm. Melt at low temperature and pour into suitable moulds.

Silver Nitrate-Coated Sounds are used by Unna:—Silver Nitrate 1, Cocoa-nut Oil 90, Yellow Wax 2, Balsam of Peru, 2, are melted together, and the sounds dipped and dried. On passing, the heat of the body melts the coating. Brilliant results in obstinate cases of gonorrhœa.– H.

Argenti Nitras Induratus, Toughened Caustic (*Off.*). Contains 5% of potassium nitrate moulded into caustic points.

Caustic Points are supplied in glass tubes, and in wood and vulcanite cases.

Argentic Hair Dye (Black or Brown).

No. 1 Solution.—Silver Nitrate 1, Distilled Water to 12.

No. 2 Solution.—Sulphurated Potash 1, Distilled Water to 8. After washing and drying the hair, the solutions to be applied separately, in above order, and after 2 minutes the hair well washed with rain water. This dyes black, but lighter shades may be obtained by using a weaker strength of No. 1 solution, which should not be allowed to touch the skin.

Black Dye.

No. 1 Solution.—Pyrogallic acid 1, Alcohol (90%) 8, Distilled Water 40. Apply before No. 2.

No. 2 Solution.—Silver Nitrate 1, Strong Solution of Ammonia 1, Distilled Water to 8. Use as last.

Ophthalmic Discs of Silver Nitrate contain $\frac{1}{500}$ grain in each combined with gelatin.

Pigmentum Argenti Nitratis Æthereum, L.H.

Silver Nitrate 20 grains, Distilled Water 1 drachm, Spirit of Nitrous Ether to 1 ounce, and **Causticum Argenti Nitratis**. St. J. H. Silver Nitrate 20 grains, Spirit of Nitrous Ether 1 ounce. Are caustic even when painted on a greasy skin. For pruritus ani, 3 grs. to the ounce.—B.M.J. ii./04,981.

Eczema of the flexures has been well treated by a pigment of strength 10 grains to the ounce

Pilula Argenti Nitratis et Morphinæ Acetatis, Crocq's Pill, contains $\frac{1}{6}$ grain of each salt made with Kaolin Ointment.

Argenti Oxidum (*Off.*).

Ag_2O=230·10 (231·86 I. Wts.).

Dose.—$\frac{1}{2}$ to 2 grains in a pill with kaolin ointment.

Is not so caustic in action as silver nitrate. Continued administration may discolour the skin. It readily yields its oxygen, and will explode (if mixed) with such bodies as phenol and creosote.

Uses.—Has been given in epilepsy, chorea, and dysentery. It stains the skin less than the nitrate.

Picratol. Silver Trinitrophenol.

Contains 30% Silver, which is readily liberated on coming in contact with organic matter.

Vaginal Suppositories of picratol 1 grain, and 2 grains with boroglyceride and gelatin basis, as also **Urethral Suppositories** $\frac{1}{2}$ and 1 grain are prepared.

Argentamine. Ethylene-diamine-silver Phosphate.

A solution of silver phosphate (8%) in ethylenediamine solution (15%), corresponding in strength of silver to a 10% solution of the nitrate. A colourless alkaline liquid, antiseptic and germicide, without the styptic effect of silver nitrate. Injections for gonorrhœa, 1 in 2,000–4,000 solution, used.—B.M.J.E. ii./95,20.

In blenorrhœa neonatorum the upturned eyelids should be painted with 5 to 10% solution. Dilute Potassium Permanganate, or Boric Acid solutions should be used in addition to remove secretion.—M. 1901, 43.

Alternate use of Argentamine and Hydrogea Peroxide solution in gonorrhœa.—Therap. 1900,12.

Argentol.—*Syn.* Argentic Quinaseptol.

$C_9H_5N.OH.SO_3Ag$=329·58 (332·078 I. Wts.).

An antiseptic and haemostatic with deodorant properties, promotes granulation of wounds.

Argonin. Contains about 4% Silver.

A compound of silver nitrate and casein-soda, in white powder, slightly soluble in water. It is antiseptic and not so caustic as silver nitrate. Solutions 1 to 5% recommended for injection in gonorrhœa, and $\frac{1}{2}$% solutions are used in ophthalmic practice.

Solubility of Argonin, Airol and Protargol increased

and decomposition prevented by addition of glycerin, in making aqueous solutions in the cold.—P.J. i./00,364.

Argyrol.—*Syn.* VITELLIN.

A silver salt containing 30% of metallic silver, combined with a proteid obtained from wheat. It is extremely soluble, as 1 oz. of it is freely taken up by less than a dessert spoonful of water, but insoluble in alcohol 90%. Strong solutions do not irritate mucous membranes. Good results have been obtained in diseases of the eye and genito-urinary tract. 10 to 30% solutions have been used with good results in acute rhinitis, of the ordinary "cold-in-the-head" variety, after preliminary treatment with 1 in 3,000 adrenalin solution. In chronic catarrh of the larynx also useful, same strength. 50% solution has been employed in a few cases of acute purulent otitis media with satisfactory results. A 25% solution may be freely instilled in purulent conjunctivitis. (For a newly-born infant apply for one minute every four hours.—B.M.J. ii./04,1635); for injections in acute gonorrhœa 2 to 5% is sufficiently strong. In cystitis 1 oz. of 20% solution may be injected, allowing it to remain in the bladder.—L. ii./03,1716. Is incompatible with Cocaine Hydrochloride and other alkaloids.

A 50% solution has also given good results in tertiary syphilitic lesions of the mucous membrane of the tongue, mouth and nose.

Argyrol solutions stain very much less than other silver salts. Ulcerative blepharitis is best treated by rubbing the inflamed lids with absorbent wool soaked with 25% solution.

Ointment 10 grains to the ounce in eczematous conjunctivitis and keratitis. "Ocular Therapeutics," Stephenson.—M.P. Aug., 1905; P.J. i./05,299.

Ophthalmia neonatorum 20% solution good.—B.M.J. ii./04,1246.

Persistent opthalmia.—B.M.J. ii./04 1635.

Ulcerative colitis treated by washing out with 1½ pints of 1% argyrol solution at 80°F.—B.M.J. i./06,80.

Diphtheria, of the conjunctiva, well treated with 15% solution.—M.P. Aug., 1905.

Follicular conjunctivitis treated by emptying the follicules by pressure between the two thumb nails, and then touching the spots with 20% argyrol solution. The

argyrol solution is fixed in the tissue by applying a little Adrenalin 1 : 1000.—L. i./05,1161;

'Sterules' of Argyrol Solution, 10 and 25% strength are prepared.

Collargol, Colloid Silver. — *Syn.* ARGENTUM COLLOIDALE, ARGENTUM CRÉDÉ.

Dose.—$\frac{3}{8}$ to 2 grains (0·025 to 0·15 Gm.) in pills or solution.

To prepare—dissolve Citric Acid 300 in water 2,000, and neutralise with Ammonia. Mix with this a solution of Ferrous Ammonium Sulphate 558 in water 2,000, and add in small quantities at a time Silver Nitrate 60, dissolved in water 600, with constant stirring. Allow to deposit in the dark. Collect, wash and dry precipitate between 40° and 50° C.—Y.B.P. 1903,275.

Black scales, miscible in all proportions with water, but does not form a clear solution even when dilute.

Used as a bactericide, 1 in 100 to 10,000 in equal parts of glycerin and white of egg or aqueous Solution.

Internally has been used for gastric and intestinal catarrh. Antiseptic uses.—B.M.J.E. i./03,23.

For ophthalmic use 1 to 5% solutions are employed. In septic infections of the eye 15% solutions with good results.—Ophthalmoscope, May 1906,300.

German physicians have proposed intravenous injections of a $\frac{1}{2}$ to 1% solution for septic affections such as endocarditis.

Suppositories of Collargol. Collargol $2\frac{1}{2}$ grains, glycerin and cacao butter *q.s.* for one suppository, or

Compound Suppository, Collargol $2\frac{1}{2}$, dionin $\frac{2}{3}$, extract of Indian hemp 2 grains, glycerin and cacao butter *q.s.* In pelvic suppurations with pain, tenderness and general septic symptoms.

Tablets of Collargol 1 grain.

Unguentum Crédé. Collargol 15, Adeps Benzoatus 75, Cera Alba 10.

For eczema, syphilis, and gonorrhœa, and as a prophylactic to gonorrhœal ophthalmia.—B.M.J.E. ii./01,16; Pr. lxx.453.

In septic conditions of various kinds inunctions of this ointment are useful.—M. Arch., 1905,380.

Ichthargan. Silver Thio-hydrocarburo-sulphonate. Siver Ichthyolate.

A powerfully antiseptic odourless brown powder containing 30% silver, soluble in water and glycerin. Forms a non-transparent liquid with twice its weight of water, but even 1 in 10 is not perfectly clear. It is practically insoluble in alcohol 90%. Claimed to be of considerable value in ophthalmia and urinary diseases, 1 to 3% solutions brushed on in trachoma. From 1 in 3,000 up to 1 in 500 solutions are used for injection in gonorrhœa; 4% for nose and throat in glycerin or water.—P.J. i./01,138.

Largin.

A silver-albumen compound containing 11·10% of silver. Dissolves in water to the extent of 10·5%, and is also freely soluble in glycerin, blood serum and solutions of peptone. It is used as an anti-gonorrhoic, and a 1 in 4,000 solution has been found to destroy gonococci in about five minutes, and all bacteria in ten minutes.—P.J. ii./98,435; i./00,413.

Largin useful in 10% Solution in acute contagious ophthalmia.—Therap. 1900,115.

Ophthalmic blenorrhœa relieved.—B.M.J.E. i./00,68.

Protargol, P. Austr. Argentum Proteinicum. P. Belg.

A proteid compound, containing 8% of silver, very soluble in water. Useful in gonorrhœa as a painless bactericide.—L.i./98,872; Pr. lx. 310; B.M.J.E.i./98,40. Gonorrhœa well treated by (2 to 5%.) solutions followed by injections of Zinc Chloride (½%) solution as astringent.—L. ii./04,1223. For middle ear disease.—Pr. lxvi. 449.

For conjunctivitis.—B.M.J.E. ii./98,40.

Solutions ¼ to 1% (or stronger up to 10 and 40%) for ophthalmic use, and from 4 to 20% for wounds and ulcers, urethral injection ½, 1, 5, and 10% are prepared by rubbing the powder into a paste with water and diluting as required with cold or lukewarm (not hot) water. Is found to stain the conjunctiva to some extent. Ointments 5 to 10%. It is alkaline to litmus and precipitates alkaloids, *e.g.*, cocaine salts. The use of Boric Acid Solution as solvent has been suggested (C.D. ii./04, 498) to prevent this occurrence, but our experiments do not confirm its utility.

Liquor Protargol, R.O.H. 10 to 40 in 100 Useful in various forms of Ophthalmia.

'**Collapsubes**' of Protargol Ointment of paraffin basis, 2% and stronger as required (*v.p.* 292), with catheter attachment are prepared for urethral medication in gonorrhœa.

'**Sterules**' of 10 and 25% solutions are prepared.

'**Solubes**' contain 4·4 grains for preparing an ounce. of 1% solution of Protargol.

Albargin.

Another similar non-irritant silver compound. Contains 15% of silver, and is of sand-like appearance. Freely soluble in water (about 1 in 2), and soluble in alcohol 90% about 1 in 130. For gonorrhœa a 0·2% solution is injected 4 or 5 times daily.—M. 1901,40.

ARSENIUM.

As = 74·5 (75 I. Wts.).

Acidum Arseniosum (*Off.*). As_4O_6 = 393·28 (396 I. Wts.). U.S. As_2O_3 = 196·44. P. Austr. *Syn.* Arsenic; White Arsenic (Arsenious Acid, B.P.1885).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·0043 Gm.).

P.G. maximum single dose 0·005 Gm.; maximum daily dose 0·02 Gm.

Arsenious anhydride, obtained by roasting arsenical ores, occurs in heavy lumps or white powder.

Soluble 1 in 100 of water. The solubility in weak Hydrochloric Acid solution is not appreciably greater. —P.J.i./02,511,552. More soluble in alkaline hydroxide and carbonate solutions. Is also soluble in 5 of Glycerin (*Off.*). Our experiments did not confirm this solubility by any means. Physical characters of specimens, however, vary considerably.

Incompatible with Iron Salts, Lime Water, and Magnesia.

Uses.—It is given internally immediately after meals as a general tonic and nerve tonic, as for chorea, in diabetes and anæmia, as antiperiodic for malaria, for chronic skin diseases, and in association with iron, which it appears to render more easily assimilated. It is said to increase respiratory power and to improve the complexion.

All preparations of arsenic should be given after food. Externally it has a caustic action and is put into the cavities of carious teeth to kill the nerves. In Austria arsenic has been added to the diet of the Styrian mountaineers under the belief that it improves their capacity for breathing. Recommended for treatment of asthma. —M.A. 1906,132. In chorea.—M.A.1906,155.

Notes on the Report of the Royal Commission on Arsenical Poisoning in Food and Drink.—B.M.J. ii./03,1557,1610; L. ii./03,1674.

Hammond's Vermin Remedy contains a great proportion of Arsenic.

Detection of Arsenic. At the suggestion of the Royal Commission on Arsenical Poisoning the Pharmacopœia Committee of the General Medical Council instructed Dunstan and Robinson to investigate the sufficiency of the tests in the B.P. for detection of arsenic in drugs. Their report advises the method of Mayençon and Bergeret to be utilised, and they have drawn up the following for insertion in Appendix III. of the B.P. in place of the present remarks on arsenium.

A solution of 4 Gm. of the drug is to be prepared as described in a series of special notes, and is to be diluted with water to a volume of 25 Cc. This solution is to be placed in a test tube of about three-quarters of an inch (about 2 Cm.) in diameter and 7 inches to 8 inches (18 to 20 Cm.) in length. Fragments of **granulated zinc are to be put into the test tube** until they reach to about two-thirds of the height of the liquid. Immediately after adding the zinc a small plug of cotton-wool is to be placed in the test tube above the liquid, and then a plug of **plumbised cotton-wool**, so as to leave a short space between the two plugs, and a closely fitting cap formed of two mercurialised test papers to be fastened on; it must not be torn at all when fastened on the test tube. The test is to be allowed to continue for two hours at least, and the test paper is to be examined by daylight for a yellow stain. The test should be conducted in a place protected from strong light.

It is applicable both in the case of arsenious and arsenic compounds. For comparative purposes the stain given by 0·012 milligramme of arsenium is utilised. The present limit of arsenium in the B.P. is taken at 3 parts per million, and the investigators consider that this proportion of the impurity might for the drugs given in small doses be adopted as the limit permissible. This limit is equivalent to $\frac{1}{350}$ grain white arsenic per pound of the substance. The limit for tartaric and citric acids, which are largely used in foods and drinks, is placed at $\frac{1}{100}$ grain of arsenious oxide per pound, *i.e.*, 1·07 of arsenium per million.

In sulphuric, nitric and hydrochloric acids the limit of $\frac{3}{10}$ths of one part per million of arsenium is recommended, and for solution of ammonia so small a content as $\frac{1}{10}$ is attainable.—P.J. ii./04, 373; C.D. ii./04, 434.

Bird's Notes on.—P.J. ii./04, 424.

Mann's Notes on, including a discussion of the tests and different samples.—P.J. ii./04, 807.

Bettendorf's Reagent for arsenic is a concentrated solution of stannous chloride in hydrochloric acid. A colourless arsenical solution will deposit brown metallic arsenic in the cold or on warming.

Gutzeit's Test. The substance to be examined is placed in a test tube with some arsenic-free zinc and sulphuric acid. The tube is plugged with cotton wool, and covered with filter paper having a spot of silver nitrate solution. A yellowish stain resulting in a few minutes indicates presence of arsenic. A control with lead acetate paper should be conducted to obviate confusion with sulphur.

A modification of the test consists in employing alkali instead of acid for generating the hydrogen and using a spot of mercuric chloride as in the B.P. Test for arsenic in glycerin.

Modified Apparatus for Gutzeit's Test. Four ounce wide mouth bottle, fitted with I.R. cork and glass tube 200 mm. long and internal diameter 5 mm., open at both ends, the lower end drawn out with small hole about 1 Cm. from end at constriction. This arrangement allows condensed water to drip back into bottle while providing free upward passage for the gas. Roll of lead paper 10 Cm. long prepared with 10% solution of lead acetate and subsequently dried and pushed into tube so that upper end is 2 Cm. from top of tube. Cap of mercuric chloride soaked filter paper (5·5 Cm. in diam.) fits over top in ordinary manner. The hydrochloric acid used should contain small percentage of stannous chloride to assist in gas evolution and to reduce arsenic to the "ous" state. Also to make results comparable with the standard, which is arsenious anhydride in hydrochloric solution, strength 1 Cc.=0·00001 Gm. Stannous chloride is made by diluting the B.P. solution with equal volume of hydrochloric acid and boiling to eliminate arsenic completely. Filter and make up to original strength. One per cent. of this is added to the strong hydrochloric acid employed in the tests. Use 10 Cc. of the acid (containing 1% stannous chloride solution), 50 Cc. water and 10 Gm. zinc. $\frac{1}{500}$th milligram of arsenium calculated as arsenious oxide gives distinct yellow stain, *i.e.*, one part in 5,000,000 can be detected and estimated. In the estimation of iron compounds distil the arsenious chloride after reducing to the "ous" condition. After dissolving, *i.e.*, in hydrochloric acid and potassium chlorate, add stannous chloride drop by drop to reduce completely, as seen by the yellow colour of the solution being discharged.—C. D. ii./05,548; P.J. ii./04,500.

Method of employing arsenic-free ammonium chloride and magnesium powder produces a constant stream of arsenic-free hydrogen. The compound MgCl.OH is formed. Mercuric bromide is more sensitive than mercuric chloride.—P.J. i./06,555.

Marsh's Test consists in generating hydrogen by means of pure acid and zinc, and to these is added

the substance to be tested. If arsenic be present arseniuretted hydrogen is evolved, which deposits metallic arsenic in the cooler parts of the delivery tube, which is heated at several points by aid of Bunsen burners.

Certain moulds, notably *penicillium brevicaule*, have the power of decomposing arsenites with the evolution of arseniuretted hydrogen. The characteristic garlic-like odour of this gas enables the detection of 1 of arsenic in 10,000 parts of beer; this is, however, not as delicate as chemical tests.—L. ii./03,22.

Reinsch's (1842) Test consists in introducing copper to a hydrochloric solution. Cuprous chloride and hydrogen are formed. The latter reduces the arsenic to hydride; this reacts with the cuprous chloride, giving hydrochloric acid and depositing copper arsenide on the strip of metal employed. A modification (using a mil pipette as burette) is made quantitative.—P.J. ii./04, 897.

Tablets of **Arsenious Acid** contain $\frac{1}{100}$, $\frac{1}{50}$ and $\frac{1}{20}$ grain.

Antidotes.

Stomach tube and emetics, olive oil, calcined magnesia in large quantity, mucilaginous drinks, stimulants and especially—

Antidotum Arsenici, Antidote to Arsenic. P.Dan. and others. U.S. (Ferri Hydroxidum cum Magnesii Oxido.) P.G.ii., P.Helv. and P.Jap. use Ferric Sulphate.

Ferric Chloride 3 (or Strong Solution of Ferric Chloride B.P. 3), Water 17. When required for use, add this solution to Calcined Magnesia 1, previously mixed with Water 19, and shake well. Should be freshly prepared, and given in doses of a tablespoonful every 5 or 10 minutes, until the symptoms are relieved. Ferric Hydrate should be administered in at least 12 times the quantity of the Arsenic supposed to have been swallowed. The Antidote contains about 2½% of the hydrate.

The diluted Ferric Solution and the mixture of Magnesium Oxide should be kept ready in separate bottles for immediate use.

Liquor Arsenicalis, Fowler's Solution (*Off.*).

Syn. LIQUOR POTASSII ARSENITIS, U.S.

Dose.—2 to 8 minims (0·12 to 0·48 Cc.). Contains 1% of arsenious anhydride as proposed by C.U.D.

Exophthalmic Goitre,—Arsenic is a routine treatment, 5 minim doses of Liquor Arsenicalis thrice daily except during one week each month, or during the menstrual

period, for 6, 8 or even 12 months. Tincture of Convallaria to be added if pulse rate be over 110.

When prescribed with Strychnine, *e.g.* Liquor Strychninæ Hydrochloridi this Fowler's solution should not be used but the Liquor Arsenici Hydrochloricus.

Valuable in chorea; should be given to limit of toleration.—L. ii./92,19,909; B.M.J. i./02,961.

Of great value in diabetes, after sugar reduced by dieting and codeine. Should be given regularly for at least 3 months, restrictions in diet being gradually removed. Also in asthma, especially in that of children and old emphysematous people.—L. i./93,407. History of Fowler's solution.—B.M.J. ii./04,1472; C.D. ii./04, 685.

Liquor Arsenici Cinnamylicus cum Opio (Hoff.).

Dose.—6 drops, increased, twice a day after meals.

Arsenious Anhydride 1, Potassium Carbonate 2, Cinnamic Acid 3, Distilled Water 5, heat to dissolve. Add Cognac 25, Extract of Opium 3, dissolved in Distilled Water 25. Filter, and wash filter with more water to produce 100. Used as a phthisis cure; is the same strength as **Liquor Arsenicalis** in arsenic and about one-fifth weaker in opium than tincture of opium.

Liquor Arsenici Hydrochloricus (*Off.*). **U.S.**

Dose.—2 to 8 minims (**0·12 to 0·48 Cc.**) Contains 1% of arsenious anhydride. Is compatible with acid mixtures.

De Valangin's Mineral Solvent was one-third the strength of the above.

Arsenii Bromidum.

$AsBr_3 = 312·55$ (314·88 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{12}$ (**0·001 to 0·0054 Gm.**).

In yellowish white deliquescent crystals, soluble in water. Is recommended for diabetes and epilepsy.

Liquor Arsenici Bromatus. *Syn.* Clemens' Solution of Arsenite of Bromine.

Dose.—1 to 5 minims (**0·06 to 0·3 Cc.**), once or twice a day.

Potassium Carbonate 1, Arsenious Anhydride in powder 1, Distilled Water 80. Boil until dissolved. When cooled, add Bromine (by weight) 2, and Distilled Water, *q.s.* to 100. Heat until decolorised. A solution

of potassium arsenate and bromide is formed. Is useful in epilepsy and diabetes with careful diet.

Pilula Arsenicalis.

Arsenious anhydride should be well and carefully triturated with milk sugar before any liquid excipient is added. Those containing $\frac{1}{20}$, $\frac{1}{30}$, $\frac{1}{60}$, $\frac{1}{100}$, and $\frac{1}{120}$ grain are generally kept made.

Granula Dioscoridis. (P. Dan. and Codex).

Contains 1 milligramme Arsenious Anhydride, with Milk Sugar and Manna, of each 0·02 gramme. *Dose.*—1 to 5.

Pilula Arsenicalis et Strychninæ contain $\frac{1}{50}$ grain (0·0013 Gm.) of each.

Pilula Asiatica. (Codex.) *Dose.*—1 or 2 daily.

Arsenious Anhydride, $\frac{1}{13}$ grain (0·005 Gm.), Black Pepper $\frac{3}{4}$ grain (0·05 Gm.), Gum Acacia *q.s.* In chronic skin affections.

To increase the tonic effect of arsenic it is often combined with iron, as in—

Pilula Ferri Arsenicalis. *Dose.*—1, 3 times a day.

Arsenious Anhydride, in fine powder $\frac{1}{60}$, Exsiccated Ferrous Sulphate 3, Syrup $\frac{1}{2}$; in grains, for one pill; in grammes, for fifteen.

The combination of arsenic and sulphate of iron the most efficacious treatment in chlorosis and anæmia.—L. i./93,404.

Pilula Ferri Arsenicalis cum Strychnina is the same with Strychnine Hydrochloride $\frac{1}{60}$ grain.

Tablets, of Arsenious Acid $\frac{1}{64}$ grain and Blaud's Pill 4 grains. *Dose.*—1 to 4.

Tablets of Arsenic, Iron and Quinine contain Arsenious Acid $\frac{1}{60}$ grain, Ferric Hypophosphite 2 grains Quinine Acid Sulphate 1 grain.

Pasta Arseniosa R.D.H.

Arsenious Acid 2, Morphine Acetate 1, Creosote sufficient to form a paste.

Pasta Arsenicalis. Arsenical Paste, Martindale. For dental caries to destroy the nerve, after use, plug with Chloroform and Mastiche; this should be used with caution as it is very *poisonous*.

Arsenious Anhydride, levigated, 30, Plaster of Paris 15,

Morphine Sulphate, 20, Cocaine 5. Mix and add Oil of Cloves 5, Phenol 25.

The two above preparations should be carefully distinguished.

Apply as follows:—Remove as much carious tissue as possible, exclude moisture and disinfect. Apply arsenic paste as near pulp as possible and protect by concave cap. Seal cavity carefully. About $\frac{1}{16}$ grain of Arsenious Acid is sufficient.

Baldock's Paste is also used by many dentists.

Dental Arsenical Fibre. *Syn.* Arsenious Wool. Gossypium Arseniosum, R.D.H. Arsenious Acid 5, Tannin 2, Morphine Acetate 10, Carbolic Acid liquefied *q.s.* to make a mass.

Mix with a sufficiency of finely cut cotton wool and allow to dry. Used in the same way as Pasta Arsenicalis. Some formulæ contain creosote *vice* carbolic acid.

Pulvis Arsenici Escharoticus. Arsenical Powder (Cazenave). Arsenious Anhydride, levigated 1, Mercuric Sulphide (Cinnabar) 5, Animal Charcoal 1. Used as a caustic, formed into a paste with water.

Pigment of Arsenious Acid 1, Alcohol Absolute 75, and Water 75 applied to cancerous sores destroys the diseased parts.—B.M.J.E. ii./01,15; M.A. 1904,228

Arsenii Iodidum. (*Off.*). U.S. $AsI_3 = 452{\cdot}2$ (455·91 I. Wts.), (452·1 U.S. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{5}$ grain (0·0032 to 0·013 Gm.) in a pill.

Employed internally and externally in various skin affections, *e.g.*, scrofula, leprosy.

The two elements by direct combination form small orange-coloured crystals, readily and almost entirely soluble in water and in alcohol. Solution 1% 1 to 10 drop doses in milk, useful for lymphatic and scrofulous children, has marked iodine effect.

New method of making:—Arsenium powdered 10, Iodine resublimed 51, mixed in presence of water, digest at gentle heat for a time and evaporate to dryness.—P.J. i./05,131.

The content of AsI_3 may be estimated by titrating weighed quantity in an aqueous Sodium Bicarbonate solution with decinormal Iodine Solution.—P.J. i./04,8.

The solution should be neutral to litmus (B.P. says should not change the colour of).—Cowley, C.D. i./05,708.

Injectio Arsenii Iodidi Hypodermica.

Dose.—$\frac{1}{100}$ grain (0·00065 Gm.) in 6 minims (0·35 Cc.) of sterile water.

The strength may be increased if desired.

Liquor Arsenii et Hydrargyri Iodidi (*Off.*). (U.S. has much smaller average dose, $1\frac{1}{2}$ minims.)

Syn. DONOVAN'S SOLUTION.

Contains Arsenious Iodide and Mercuric Iodide, of each 1 %, $87\frac{1}{2}$ grains of each in Distilled Water *q.s.* to 20 ounces. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

Given for syphilitic skin diseases.

If prescribed with potassium iodide and sal volatile the Nessler's reagent (*q.v.*) formed produces colouration with the ammonia, the mixture will darken and throw down a precipitate.

Pilula Arsenii et Hydrargyri Iodidi contains $\frac{1}{12}$ grain (0·005 Gm.) of each salt = $9\frac{1}{6}$ minims of the above solution. *Dose.*—1 or 2, *v.p.*393.

Cupri Arsenis. $Cu_3As_2O_6$ = 433·64 (436·8 I. Wts.). **Pure Scheele's Green.**

Dose.—$\frac{1}{100}$ to $\frac{1}{25}$ grain (0·00065 to 0·0026 Gm.).

A pale green amorphous powder, recommended for various intestinal affections, cholera morbus, cholera infantum, diarrhœa, dysentery, and typhoid. Dose for adults, $\frac{1}{5000}$ to $\frac{1}{3000}$ grain every 10 minutes for an hour, then hourly; for children, half this quantity. Small repeated doses essential. For chlorosis and functional anæmia, $\frac{1}{50}$ to $\frac{1}{25}$ grain thrice daily successful.—Ed. M.J. 1890,550; P.J. 1890,247; B.M.J.E. ii./90,48; i./91,27; i./92,48.

Is recommended to be given to prevent the occasional generation of sulphuretted hydrogen in the bowel on administration of magnesium sulphate.—Eclectic M.J., August, 1905.

Acidum Arsenicum. — *Syn.* **Ortho-Arsenic Acid.** $H_3AsO_4.\frac{1}{2}H_2O$ = 149·96 (151·032 I. Wts.).

Dose—$\frac{1}{60}$ to $1\frac{1}{2}$ grain (0·001 to 0·0043 Gm.). A crystalline powder soluble about 1 in 140 of water, and about 1 in 350 of Alcohol 90% (arsenites are said to

be twice as active as arsenates). The following salts are in use:—

Ferri Arsenas (*Off.*). *Dose.*—$\frac{1}{16}$ to $\frac{1}{4}$ grain (0·004 to 0·016 Gm.) in a pill.

This is an amorphous greenish powder and consists of Ferrous Arsenate, $Fe_3(AsO_4)_2,6H_2O$=550·12 (553·796 I. Wts.) (not less than 10%) with Ferric Arsenate $Fe_2(AsO_4)_2$=387·24 (389·8 I.Wts.), and Iron Oxide. In chronic skin affections of all kinds.

Useful in night-sweats.—L. ii./94,1023.

Ferric and ferrous arsenates. In view of the fact that ferrous arsenate by action of the air and moisture rapidly oxidises it is suggested that ferric arsenate should replace this substance.—P.J. i./05,71.

The precipitate by the B.P. method is di-ferrous arsenate —C.D. i./05,792.

Tablets contain $\frac{1}{8}$ grain (0·008 Gm.).

Quininæ Arsenas, *v.p.*590.

Sodii Arsenas. Na_2HAsO_4=184·78 (186·108 I Wts.). (*Off.*). *Dose.*—$\frac{1}{40}$ to $\frac{1}{10}$ grain (0·0016 to 0·0065 Gm.)

Sodium Arsenate crystallises with either 7 [$Na_2HAsO_4,7H_2O$=309·94 (312·220 I. Wts.)], **U.S., Ph. Ned.,** P. Belg., or 12 molecules [M.W. = 399·34 (402·3 I. Wts.)] of water and is efflorescent as well, the proportion of arsenic it contains is therefore uncertain. It is official in the anhydrous state, in white powder, dried at 300° F., containing 61·8% of As_2O_5. 1 of the anhydrous salt equals 1·68 of the salt with $7H_2O$.

Should be a crystallised salt containing 36·85% of arsenic acid.—C.U.D., *i.e.*, with $7H_2O$. In other pharmacopœias the crystallised salt is official, so unification is certainly necessary.—B.M.J. i./03,29.

Soluble 1 in 5 of water (B.P. 1 in 6). Slightly soluble in alcohol.

In trypanosomiasis —B.M.J.i/05,1140.

Sodii Arsenas Exsiccatus, U.S., is anhydrous and 98% pure. Soluble 1 in 3 of water at 25° C.

Pilula Sodii Arsenatis, $\frac{1}{32}$ and $\frac{1}{64}$ grain.

Injectio Sodii Arsenatis et Ferri.—ZAMBELETTI'S FLUID is similar. *Dose.*—5 to 10 minims (0·3 to 0·6 Cc.), hypodermically.

Sodium Arsenate 0·1 gramme, Iron and Ammonium Citrate 0·8 gramme, Aqua Laurocerasi 20 grammes.

Has been employed with much advantage, particularly in Italy, in leucocythemia.

Hypodermic 'Sterules' of this fluid are prepared containing 15 minims.

Liquor Sodii Arsenatis (*Off.*), U.S.

Dose—2 to 8 minims (0·12 to 0·48 Cc.). 1%. Is about ten times the strength of Pearson's Solution of Arsenic (Codex), much used on the Continent, which is 1 of crystallised arsenate in 600 of water.

Sodium Arsenate has been given hypodermically to cure disease set up by tsetse fly in Africa for cattle, and its use suggested for man.—L. ii./04,15.

Arsenical Cigarettes are made of paper impregnated with sodium arsenate, so that each contains ¾ grain (0·05 gramme) of the salt. The patient ought to inspire the fumes deeply three or four times.

Histogenol, described as an "arsenio-phosphorated" mixture, is supplied in the form of an emulsion. *Dose*.—2 drachms to 1 ounce before meals, also as an elixir, granules, and ampoules for injection.

Acidum Cacodylicum. Dimethylarsinic Acid $(CH_3)_2$ AsO. OH = 137·08 (138·056 I. Wts.)

Dose.—½ to 2 grains (0·032 to 0·13Gm.).

Has recently been much employed in medicine, particularly in France. It is the ultimate product of oxidation of arsenium-dimethyl (cacodyle), and of cacodyle oxide (alkarsin, $(CH_3)_4As_2O$ = 224·52 (226·096 I. Wts.). It occurs as colourless crystals. ***Soluble*** about 2 in 1 of water and 1 in 4 of alcohol 90%, and although containing 54·4% arsenium, equivalent to 71·4% arsenious acid, it is relatively non-toxic. It will be noted that this acid has only 1 OH group, hence is not so toxic as its parent arsenic acid, with 3 OH.—Dixon. The following compounds are used:—

Ferri Cacodylas. $[(CH_3)_2AsO_2]_3Fe$ = 463·84 (467·044 I. Wts.) *Dose*.—¾ to 5 grains (0·05 to 0·32 Gm.) *per os* per diem, or ½ to 1½ grains (0·03 to 0·1 Gm.) hypodermically per diem.

Yellowish powder soluble 1 in 15 of water, used for anæmia, lymphadenitis and chlorosis.—P.J.ii./90,486.

Guaiacol Cacodylas. $(CH_3)_2.AsO.O.C_6H_4(OCH_3)$ (?) = 242·33 (244·104 I.Wts.). *Syn.* CACODYLIACOL.

Dose.—½ to 2 grains (0·03 to 0·13 Gm.) *per os* or hypodermically in affected regions for tuberculosis.

In whitish granules with alliaceous odour combined with that of guaiacol.—P.J.i./00,246; C.D. i./00,932.

Magnesii Cacodylas. $[(CH_3)_2AsO_2]_2Mg,?H_2O$.

Dose.—$\frac{3}{4}$ grain (0·05 Gm.) hypodermically, gradually increased (5% solution suitable). White amorphous powder soluble 1 in 3 of water. Its properties are similar to those of the sodium salt both chemically and therapeutically. *q v.*

Solutio Hydrargyri Iodo-Cacodylatis.

Dose.—15 minims.

This solution is prepared by dissolving Mercury Cacodylate 15 grains (1 Gm.) and Cacodylic Acid 30 grains (2 Gm.) in water 2½ ounces (75 Cc.). Separately Sodium Iodide 15 grains (1 Gm.) is dissolved in water 80 minims (4·7 Cc.) and this solution is added to the former. The mixture is then neutralised with dilute Soda Solution, and the volume made up to 3 ounces, 160 minims (100 Cc.). Of this solution 15 minims contain ½ grain (0·03 Gm.) Mercury-iodo-cacodylate (equivalent to $\frac{1}{16}$ grain Mercuric Iodide). This amount is injected on alternate days in the treatment of syphilis and may be increased if desired.—M.02,8.

Sodii Cacodylas.

$(CH_3)_2AsO_2Na+3H_2O = 212·6$ (214·146 I. Wts.).

Dose.—Average per rectum and hypodermically ½ to 1 grain (0·03 to 0·065 Gm.) *v.p.*150.

The salt contains 46·8% of arsenium, equivalent to 61·8% arsenious acid. That in commerce usually contains 18 to 25% of water. It frequently contains some uncombined cacodylic acid and should therefore be carefully examined, and, being a deliquescent salt, solutions should be standardised.

Soluble 2 in 1 water, in alcohol 1 in 1.

Cancer improved by hypodermic injections.—L. i./01, 1462. In chorea gives benefit.—M.A. 1906,155.

Elixir Sodii Cacodylatis (standardised).

Dose.—30 minims (equivalent to ½ grain of the salt).

This forms a palatable method of administering the salt.

Pills contain ½ grain (0·03 Gm.).

The following formula in grains is useful:—

Sodium Cacodylate 50, Benzoin 50, Liquorice Powder 50, Acacia Powder 25, Alcohol 90% *q.s.* Divide into 100 pills. *Dose.*—1, three or four times a day.

Hypodermic Injection. A sterile preparation is made and standardised to contain 0·05 Gm. (¾ grain) of Cacodylic Acid in 1 Cc. (17 minims) an average dose once in 24 hours.

Intravenous Injection of the same strength as the hypodermic injection has been employed in phthisis. The dose of 17 minims has been given 1 to 4 times daily.—M. 01,84.

Glass Capsules (sterile) containing the average dose of this standardised injection are prepared and are convenient for use.

For tuberculosis, Gautier employed ⅖ grain (0·025 Gm.) for the first injection. Double this amount is given the second day, this dosage being kept up for 7 days. Then follow 7 days or more in which the treatment is suspended, after which the dose is increased up to 1½ grains (0·1 Gm.) daily, and this is maintained unless there be signs of intolerance—stomach-ache, urticaria, tinnitus aurium, deafness, in which case the dose should be diminished to the lowest which is efficacious.

Gautier gives at the same time small doses of Potassium Iodide (0·05 Gm. per diem). He also gives Alkaline Phosphates and raw meat, and where the lung is the seat of the disease he gives inhalations of Carbon Disulphide—a few drops on cotton wool to be inhaled three or four times in 24 hours.—M. 01,33.

Rectal Injection. The dose is similar to that of the hypodermic method, but more dilute—½ to 1 grain in 1 to 4 drachms of water (conveniently prepared by diluting the contents of one of the capsules above).

Sodium Cacodylate has been employed in tuberculosis, phthisis, and consumptive cases generally, in diabetes mellitus, exophthalmic goître, pernicious anæmia, cancer (particularly of the stomach), malaria, chorea, leprosy, psoriasis, and other chronic skin affections, and in all cases in which arsenic has been used. But when given by the mouth or per rectum the drug may cause renal congestion with albuminuria and fall in the quantity of urine excreted.

The cure of tubercle is slow, and if fever be present it will only fall a few tenths of a degree per month. If there is loss of appetite this always returns after the third or fourth injection of a dose of 0·03 to 0·05 Gm. of the salt while the patient's weight and strength

increase. On the whole the hypodermic method of administration — regularly every day for a week, resuming after a break of a week or so, and so on— may therefore be most advocated, though even this causes the patients to give off an alliaceous odour.— B.M.J. i./01,120; B.M.J.E. ii./99,15,64; B.M.J. i./01, 50; L. ii./99,1408; L. i./00,1446; P.J. ii./00,724; ii./02,336.

Pyrexia of tuberculosis treated with Sodium Cacodylate.—B.M.J.E. i./06,17.

Bunsen demonstrated relative non-toxicity of cacodyle compounds 60 years ago.—L. i./03,474.

Arsycodile. A Sodium Cacodylate compound employed in skin affections, and in neurasthenia, malaria and diabetes. **Pills** contain 0·025 Gm. Sodium Cacodylate, and **Ampoules** for hypodermic use containing each 0·05 Gm. are supplied.

Di-sodium Methylarsenate.

$Na_2AsCH_3O_3 = 182{\cdot}81$ (184·124 I. Wts.).

Syn. ARRHENAL, ARSINYL.

Dose.—$\frac{2}{3}$ to 3 grains (0.025 to 0·2 Gm.) *per os* or hypodermically.

This preparation has been called the "**New Cacodyle.**" It is prepared by the interaction of Methyl Iodide and Sodium Arsenate in presence of excess of Alkali. The compound contains 34·5% of metalloid Arsenium, corresponding with 45·5% of Arsenious Acid.

Soluble in water to the extent of about 1 in 1, and only slightly in alcohol 90%. It has been employed in tuberculosis, emphysema, ague, syphilis, and various skin affections.—L. i./02,623; B.M.J. i./02,804; B.M.J.E. i./02,68; ii./02,23.

Sodium arsenate hypodermically in chorea and chronic eczema gave better results.—L. i./03,304.

Elixir Arsinyl contains $\frac{1}{5}$ grain in 1 drachm, and **Globules of Arsinyl** contain $\frac{1}{4}$ grain each.

Atoxyl. META-ARSENIC-ANILIDE.

$C_6H_5NHAsO_2 = 197{\cdot}66$ (199·088 I.Wts.). An organic arsenic compound. It contains 37·67% of arsenic; is in the form of a white powder, and possesses a slightly saline taste; is soluble about 1 in 6 of water, and is used in this form for subcutaneous injection. (It is also soluble about 1 in 125 of alcohol 90%.) The solution

is slightly warmed at the time of injection in doses of ¾ grain (0.05 Gm.) up to 3 grains (0·2 Gm). It is relatively non-toxic, and large quantities of arsenic can thus be administered in chronic skin diseases. The substance may also be given by the mouth in similar doses.—B.M.J.E. i./02,95.

In trypanosomiasis and combined with Trypanroth. Aqueous solutions 5% strength in 5 Cc. doses intravenously or subcutaneously.—M.A. 1906,510; B.M.J. i./05,1140.

Pills of Atoxyl contain ½ grain. **Elixir Atoxyl** contains ½ grain in each drachm. **Sterules (Hypodermic) of Atoxyl** ½ grain in 17 minims (1 Cc.).

Mercury Salicyl Arsenate. *Syn.* ENESOL.

White powder containing 38% mercury. ***Soluble*** in water 1 in 25. Solution said to be painless on injection. —B.M.J. ii./04,1324.

Basic Quinine Arrhenalate, $C_{20}H_{24}N_2O_2.AsO(OH)_2CH_3$=460·89 (464·312 I. Wts.). Colourless bitter crystals, melting at 139°, containing about 16% methyl arsenic (arrhenalic) acid, very slightly soluble in water, has been prepared, as also the corresponding strychnine salt.—C.D. ii./05, 140.

ASPARAGIN.

Syn. ALTHEIN. Amido-Succinic Acid Amide. $C_2H_3(NH_2).(COOH),(CONH_2),H_2O$=149·04 (150·16 I. Wts.). *Dose.*—1 to 2 grains (0·065 to 0·13 Gm.).

In hard crystals, having a slightly acid reaction.

May be obtained from *Asparagus officinalis*, and the roots of marshmallow, liquorice, belladonna, &c. Soluble 1 in 50 of cold water, dissolves in acid and alkaline solutions. Insoluble in absolute alcohol and ether.

An aqueous solution dissolves freshly precipitated mercuric oxide, and is recommended for hypodermic injection in syphilis.—B.M.J.E. i./92,52.; P.J. ii./00, 775. Has decided diuretic effect.

For cardiac dropsy and chronic gout one grain is given three times a day.

ATROPINA (*Off.*).

$C_{17}H_{23}NO_3$=287·05 (289·224 I. Wts.).

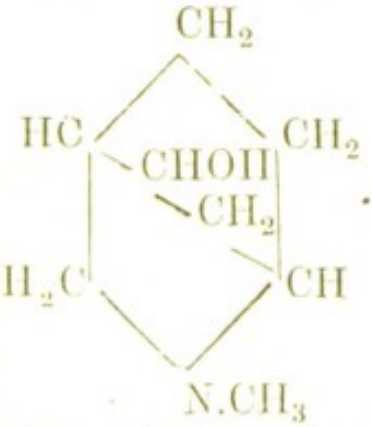
Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain (0·00032 to 0·00065 Gm.), increased to $\frac{1}{16}$, or in acute mania to $\frac{1}{8}$ grain or more. U.S. *average dose*,—$\frac{1}{150}$ grain.

An alkaloid obtained from *Atropa Belladonna*. It is generally in hard white acicular prismatic crystals or crystalline masses, strongly alkaline.

Soluble.—1 in 500 of water, 1 in 3 of 90% alcohol, 1 in 36 of ether, 1 in 1 of chloroform, 1 in 40 of olive oil, freely soluble in glycerin and oleic acid. Melts at 239° to 240° F. (U.S. 237°F.) Being so insoluble in water, it is not suitable for internal use,—is generally given as a sulphate.

Incompatible with caustic alkalis and mercurial salts.

The mydriatic alkaloids, Atropine and Hyoscyamine may be manufactured from *Atropa Belladonna*, *Datura Stramonium*, *Duboisia myoporoides* and *Hyoscyamus niger*, and Hyoscine may be obtained from the last two plants. Atropine does not exist as such to any great extent in these plants, but is produced from the Hyoscyamine (its isomer) by the action of Alkali which is present in the process of manufacture. Duboisine is nearly pure hyoscine. Pure atropine and pure hyoscyamine are isomeric. So are hyoscine and atroscine, *v.p.* 415. By the action of baryta water both Atropine and Hyoscyamine split up into Tropic Acid and Tropine. Atropine is in reality Tropine—



. or $C_8H_{15}NO$=140·1 (141·16 I. Wts.)

with the hydrogen atom of the hydroxyl group replaced by the Tropic Acid Radical :—

$$C_6H_5 - CH\begin{cases}CH_2OH\\CO\end{cases}$$

Hyoscine and Atroscine split up into Tropic Acid and Oscine. Therapeutically, Hyoscine possesses about five times the calmative power of Atropine or Hyoscyamine.

Tropine and tropic acid may be recombined under certain conditions to form Atropine, or tropine may be combined with other acids such as salicylic or mandelic

acid to form salts. These salts when treated with diluted hydrochloric acid form a class of artificial alkaloids, to which the generic name of *tropeines* is given. One of these so produced from the mandelate of tropine is **Homatropine** or oxytoluyltropeine. *v.p.* 160.

Atropine should be neither dextro- nor lævo-rotatory, showing freedom from Hyoscyamine or Scopolamine. —Y.B.P. 98,429.

Uses.—Atropine and its salts are used for ophthalmic purposes to dilate the pupil and to paralyse the accommodation.

Given internally or hypodermically, they are antagonistic to opium and morphine, Calabar bean and physostigmine, jaborandi and pilocarpine, aconite and aconitine, bromal, and hydrocyanic acid. Physiologically, whilst it acts as a "stimulant" to a large part of the central nervous system, it paralyses many of the nerves. It lessens the perspiration, especially the night sweats of phthisis, the flow of milk and saliva, most of the secretions, but not the amount of the urine.

Its administration does tend to cure inebriety.—Owen Lankester.—B.M.J. ii./05,106.

McBride's treatment for inebriety;—

First week, Atropine $\frac{1}{100}$ grain, Strychnine $\frac{1}{60}$ grain *t.i.d.*
Second ,, ,, $\frac{1}{80}$,, ,, $\frac{1}{30}$,, ,,
Third ,, ,, $\frac{1}{50}$,, ,, $\frac{1}{30}$,, ,,
Fourth ,, ,, $\frac{1}{100}$,, *sine* Strychnina

together with a mixture of Cinchona Extract, Sal Volatile, and Spirit of Chloroform.—B.M.J. i./05,132.

It is also injected to relieve pain in sciatica and is given to check bed wetting, and to relieve spasm of pain of urinary calculus, cystitis, and ptostatitis. Relieves bronchial spasm, also whooping cough and asthma.

Antidotes.—Stomach pump and emetics followed by stimulants, hot coffee, morphine hypodermically $\frac{1}{3}$ grain every two hours or pilocarpine nitrate $\frac{1}{2}$ grain, hypodermically. Electricity, heat, and artificial respiration.

Vitali's Reaction.—On evaporating a trace of Atropine, or one of its salts in a porcelain dish with a few drops of fuming Nitric Acid a yellowish residue is produced, which on moistening with Alcoholic Potash (1 in 10) produces a violet colour. Strychnine does the same on employing a 4 per cent. potash solution, but the colour is evanescent. Veratrin produces a reddish violet or orange red colour.

Atropinæ Methyl-Bromidum. *Syn.* MYDRIASINE.

$$C_{16}H_{20}O_3N\begin{matrix}\nearrow CH_3\\ -CH_3\\ \searrow Br\end{matrix}=381{\cdot}31\ (384{\cdot}208\ \text{I. Wts.}).$$

Dose.—$\frac{1}{10}$ grain to $\frac{1}{5}$ grain (0·006 to 0·012 Gm.).

White crystals soluble in water 1 in 1 easily, and in alcohol 90% 1 in 8. Solutions of strength $\frac{1}{2}$ to 2% have been employed to produce mydriasis—the effect is said to pass off more rapidly than that of Atropine. It is best with cocaine hydrochloride 1% It has been given internally to suppress night sweats, for neurasthenia, and to keep down excessive salivation.—M.02,31. Also employed subcutaneously as a morphine substitute in croupous pneumonia, pleuritis sicca and appendicitis; for coughs, dyspepsia with pyrosis, and epilepsy. As effect passes off rapidly it is satisfactory for dilating the pupil in suspected iritis for ascertaining whether adhesions exist.—M.P., Ocular Therapeutics, Aug. 1905; B.M.J.E. i./06,72.

Atropine Salicylate $C_{17}H_{23}NO_3.C_7H_6O_2=408{\cdot}18$ (411·272 I.Wts.) and **Valerianate** $(C_{17}H_{23}NO_3.C_5H_{10}O_2)_2H_2O=794{\cdot}60$ (800·624 I. Wts.). *Dose* of either $\frac{1}{60}$ grain (0·001 Gm.)

White crystalline powders. The latter salt is used for neuralgia and neurasthenia.

Liquor Atropinæ Salicylatis (Charing Cross Hospital).—Atropine $\frac{1}{2}$ grain, Salicylic Acid $\frac{3}{4}$ grain, Water 1 ounce.

Atropinæ Sulphas (*Off.*).

$(C_{17}H_{23}NO_3)_2H_2SO_4=671{\cdot}44$ (676·524 I. Wts.).

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain (0·00032 to 0·00065 Gm.) increased to $\frac{1}{16}$, or in cases of acute mania $\frac{1}{8}$ grain.

In opaque white minute crystals, soluble 2 in 1 of water. Melting point 183° C. (P.G. 180° C)

Umney finds commercial samples melt mostly at 186° to 187°C. (367° to 369°F.). U.S. 189·9° C.

Uses.—See Atropine (base).

Tablets, $\frac{1}{100}$ grain (0·0006 Gm.).

Atropine, hyoscyamine, and hyoscine gold salts.—J.C.S. 1897,71, pp. 679-682. P.Austr. melts at 180°C.

Compound Asthma Fluid (Martindale).

This preparation contains, amongst other ingredients, a small proportion of atropine, and is found of considerable

value in preventing attacks of asthma. A few "blows" from an atomiser with a fine spray will be found sufficient to ward off an attack.

Lamellæ Atropinæ, Discs of Atropine (*Off.*).

Contain $\frac{1}{5000}$, also made with $\frac{1}{2000}$, and $\frac{1}{1000}$ grain of the sulphate in each, for dilating the pupil; others containing $\frac{1}{500}$ (R.O.H.) and $\frac{1}{250}$ grain paralyse the accommodation. Also prepared containing Atropine Sulphate $\frac{1}{1000}$ grain combined with Cocaine Hydrochloride $\frac{1}{200}$ grain, and $\frac{1}{50}$ grain of each, and Cocaine $\frac{1}{200}$ with Atropine $\frac{1}{5000}$, (R.O.H. has Atropine $\frac{1}{200}$, Cocaine $\frac{1}{100}$ grain, and Atropine Sulphate $\frac{1}{5000}$ grain with $\frac{1}{500}$ grain of Morphine respectively).

Hypodermic Tablets contain $\frac{1}{200}$, $\frac{1}{150}$ and $\frac{1}{100}$, $\frac{1}{60}$, $\frac{1}{50}$ grain in each, and also $\frac{1}{120}$ grain combined with Morphine Sulphate $\frac{1}{2}$ grain, and Atropine Sulphate $\frac{1}{200}$ grain combined with Morphine Sulphate $\frac{1}{4}$ grain, *vide* also *p.* 482.

Injectio Atropinæ Hypodermica.

Atropine sulphate 4 grains, to the ounce of distilled water. *Dose.*—1 to 2 minims, or more.

Liquor Atropinæ Sulphatis (*Off.*).

Dose.—$\frac{1}{2}$ to 1 minim (0·03 to 0·06 Cc.), or more.

Atropine Sulphate 1, Salicylic Acid 0·12, Distilled Water *q.s.* to 100. The addition of salicylic acid is objected to by oculists as being too irritating.

Is much used for ophthalmic purposes, but in many cases this solution is much too strong, as it is apt to produce glaucoma.

Guttæ Atropinæ Sulphatis, R.O.H., $\frac{1}{4}$, $\frac{1}{2}$, and 1%*.

St. Th. H. has 0·5 or 1%; U.C.H. $\frac{1}{8}$ to 1%. St. M.'s H. 0·5%.

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* **Chalk's Bottles**, with rubber cap on hollow stopper are convenient for eye drops and mostly employed. They are supplied in colourless and amber glass. Metal cases, sterilisable for same, are durable, and suitable for travelling.

Eye Dropper. A test tube with a spout a little more than half-way up the side of it. The Eye Drops may be warmed in the tube if desired, and, by inclining, the patient can administer the drops to his own eye. By plugging with a pledget of wool a solution may be kept sterile.

Ophthalmic Bottle, Lang's, is intended for ophthalmic solutions and ointments. It has no ledges on which dust can accumulate. The cap of the bottle when removed rests

ttæ Atropinæ cum Cocaina, R.O.H.
Atropine Sulphate 0·5, Cocaine Hydrochloride 2, tilled Water 100. St. Th. H. has Atropine Sulphate Cocaine Hydrochloride 2%. St. M.'s H. Atropine phate 0·5, Cocaine Hydrochloride 2·5, Water to 100. Atropine eye-drops may cause poisonous symptoms in dren.—L. ii./95, 964.

terules,' of **Atropine Sulphate** Solution, 4 grains to the ounce, are convenient in use; also of **Atropine Sulphate** Solution 2 grains to the ounce **with Cocaine** Hydrochloride 10 grains to the ounce.

Guttæ Atropinæ et Quininæ (Liverpool Eye Ear Infirmary). Atropine Sulphate 4 grains, inine Sulphate (bi-sulphate) 4 grains, distilled water unce.—B.M.J. i./04,452.

Glycerinum Atropinæ. St. Th. H. has Atropine phate 25½ grains dissolved in water 5 ounces, add mpound Tincture of Lavender 100 minims, and made to 1 pint with Glycerin. This is more cleanly than rcerinum Belladonnæ and does not stain. It approxites Glycerinum Belladonnæ in strength. U.C.H. has same formula.

nimentum Atropinæ.
Atropine 1 (more or less, if ordered), Oleic Acid 15, tor Oil 15, Oil of Lavender 1, Alcohol (90%) *q.s.* 100.

In lumbago and other rheumatic affections is very viceable used with gentle friction; it is readily orbed.

St. Th. H. has Atropine Sulphate 38¼ grains, Comund Tincture of Lavender 100 minims, Alcohol 90% 1 pint; it contains 0·375% of alkaloid which is the ength of the Liniimentum Belladonnæ. (*Off.*)

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n three points so as to pick up the minimum of dust. A all rod or pipette stands inside.—B M.J., 1./03,501.

Eye Rods have (i) pointed (ii) flattened or (iii) bulbous ls (Lang's) for ointments or solutions.

Eye Shades are—
. Card covered with silk, flat or concave, suitable for her eye. 2. Celluloid, flesh colour, for right or left eye, uitable for either eye. 3. Of pith, the "Symétrique." Straw, plaited, in three sizes. 5. Double eye shades, card, h and celluloid.

'Undine' Irrigator—An eye douche in the form of a ss flask with pointed spout.

Linimentum Atropinæ et Chloroformi, St. Th. H. contains 1 of Chloroform to 5 of the latter.

Lotio Atropinæ, U.C.H. Solution of Atropine Sulphate 12 minims, Distilled Water to 1 ounce.

Lotio Atropinæ et Hydrargyri Perchloridi, U.C.H. Atropine Lotion, Mercuric Chloride Lotion, equal volumes.

Lotio Hydrargyri Perchloridi, U.C.H. ("Eye Lotion No. 1."). Mercuric Chloride $\frac{1}{10}$ grain, Distilled Water to 1 ounce.

Oleatum Atropinæ.

Atropine 5, Oleic Acid 200. Heat in a water bath till dissolved. Perfume with otto of rose, or lavender, if preferred. Useful to paint on painful parts.

Breast Discs are prepared of lint treated with atropine oleate and contain 1, 2, and 3 grains each of the base. Are non irritating.—L.ii./05,835.

Oleum Atropinæ, R.O.H.

Atropine 1, Castor Oil *q.s.* to 100. Heat to dissolve. Forms a stable solution, *vide* Alkaloidal Oils, *p.* 516.

U.S. has Atropine 2, Alcohol 2, Oleic Acid 50, Olive Oil *q.s.* to 100.

Pessaries of Atropine are prepared with gelatin mass or at times with oil of theobroma, containing generally $\frac{1}{20}$ grain of the alkaloid in each.

S.H. has Atropine $\frac{1}{20}$ grain, Conine 1 minim, Theobroma Oil to 120 grains.

Mistura Atropinæ et Strychninæ, Gt. Orm. H.

Dose.—1 drachm (for a child 1 year old).

Solution of Atropine Sulphate 1 minim, Solution of Strychnine Hydrochloride 1 minim, Syrup of Orange 10 minims, Chloroform Water to 1 drachm.

Pilula Atropinæ, $\frac{1}{120}$, $\frac{1}{100}$, $\frac{1}{80}$, $\frac{1}{60}$ grain in each.

Taken at bedtime, to check night-sweating. Is apt to cause dryness of the throat.

Brompton H. has these strengths made with liquorice powder 2 grains, and tragacanth powder 1 grain

Pilula Atropinæ, Arsenici et Quininæ.

Quinine Sulphate 18 grains, Solution of Arsenic 12 minims, Solution of Atropine Sulphate 6 minims, Extract of Gentian 20 grains, and Acacia *q.s.* to make 12 pills. For catarrhal cold, if taken in early stage, one every 3, 4, or 6 hours, "nips it in the bud."—Pr. xxxviii.179.

Unguentum Atropinæ (*Off.*).

Atropine 1, Oleic Acid (by weight) 4 (1 grain = 2 drops), heat gently to dissolve, and add lard 45.

Unguentum Atropinæ, R.O.H.

Atropine 1 or 2, Soft Paraffin 100; heat till dissolved. **Unguentum Atropinæ cum Acido Borico**, R.O.H., has Atropine 1, powdered Boric Acid 15, Soft Paraffin 100; and **Unguentum Atropinæ cum Cocaina,** R.O.H., has Atropine 1, Cocaine (alkaloid) 2, in Soft Paraffin 100. **Unguentum Hydrargyri Oxidi Flavi cum Atropina,** R.O.H., has Yellow Mercuric Oxide 1, and Atropine 0·5, Soft Paraffin 100. **Unguentum Iodoformi cum Atropina,** R.O.H., has precipitated Iodoform 15 in place of the Mercuric Oxide in last preparation.

Vaselinum Atropinæ.

Atropine (pure alkaloid) 1, Vaseline 120.

Heat carefully till dissolved. Atropine sulphate is not soluble in vaseline.

This forms a definite, convenient, and economical mode of applying atropine to the eye. A little may be placed within the lower lid. It produces no irritation. For some purposes it will bear dilution.

In night-sweating, $\frac{1}{200}$ to $\frac{1}{80}$ grain may be increased to $\frac{1}{25}$ grain, taken at bedtime. Is apt to cause dryness of the throat, and is not so useful for this purpose as picrotoxin or pilocarpine.

Causes sleep in acute mania in dose of $\frac{1}{4}$ to 1 grain of sulphate.—R.

Use of hypodermic injection previous to the administration of chloroform as an antidote to the cardio-inhibitory effects of chloroform has been found of value.

Atropine $\frac{1}{20}$ grain is antagonistic to 1 grain of morphine. In cases of poisoning small doses should be frequently injected hypodermically, and the urine drawn off with a catheter frequently.

Eye drops of atropine 1% and cocaine hydrochloride 2%, poisoning by.—B.M.J.E. ii./04,72.

Atropine with strychnine and red cinchona bark cures inebriates.—B.M.J. i./04,1006,1169,1222,1223.

Sea-sickness. It has been suggested to treat by

paralysing the accommodation of one eye only with one drop of atropine solution, 4 grains to the ounce, daily.—B.M.J. i./05,1090.

In lead poisoning, full doses of atropine relieve the colic and head pain, keep bowels open, and assist in return of bodily powers.—L. ii./91,1161; P.J. 1891,429.

In iritis Atropine is indicated, in glaucoma Eserine.—Pr. xxxi.321.

Hæmoptysis is checked by hypodermic injection of atropine.—B.M.J. ii./87,521; Th. Gaz. Feb. 1889,101.

Cholera successfully treated by injection of atropine.—L. i./93,1443.

Poisoning from use of atropine eye-drops.—L. i./98 99; two cases, L. ii./05,964; and from ointment 4 grains to the ounce, L.i./05,714.

Antidote in fungus poisoning.—P.J. i./99,197.

The annoying dermatitis and conjunctivitis occasionally produced by atropine may be obviated by using chloretone solution as vehicle for the atropine sulphate or olive oil solution of the base may be employed.—Oph., April, May, 1905.

Homatropine, $C_{16}H_{21}NO_3 = 273{\cdot}14$ (275·208 I. Wts.) (*v.p.* 154) and its Salts, **Hydrobromide, Hydrochloride**, $C_{16}H_{21}NO_3.HCl = 309{\cdot}33$ (311·666 I. Wts.), **and Salicylate** $C_{16}H_{21}NO_3.C_7H_6O_3 = 410{\cdot}15$ (413·256 I. Wts.), are in minute granular white crystals. Their solutions act as quick and decided local mydriatics, the pupil rapidly returning to its normal condition, but Homatropine, it is said, includes none of the poisonous properties of atropine. The mydriatic action commences in $\frac{1}{4}$ to $\frac{1}{2}$ hour, and disappears in 6 hours. The salts are freely soluble in water; Homatropine (the base) is nearly insoluble in water, but soluble in oils, or 1 in 100 of soft paraffin. *Dose of each.*— $\frac{1}{30}$ to $\frac{1}{20}$ grain (0·0008 to 0·0032 Gm.).

Oleum Homatropinæ. A 2% solution in castor oil, by weight, dissolved by heat.

Oleum Homatropinæ cum Cocaina, contains in addition 2% of cocaine. R.O.H. has 10 grains of each to the ounce, practically the same strength.

These oily solutions, when dropped into the eye, are not washed out by the tears.

Homatropine oil recommended in preference to atropine in estimating lesions of refraction; inconvenience of mydriasis may be partially overcome by eserine.

Homatropinæ Hydrobromidum. (*Off.*), U.S.

$C_{16}H_{21}NO_3HBr = 353{\cdot}49$ (356·176 I. Wts.),

In minute trimetric crystals, soluble 1 in 6 of water, 1 in 133 of Absolute Alcohol. Is the salt mostly used.

One Cc. of a 1% solution made alkaline with ammonia, shaken out with chloroform, and the chloroform evaporated to dryness; the residue should turn yellow and finally brick red when warmed with 1·5 Cc. of a solution (Alcohol 5 and Water 3) of 1 in 50 mercuric chloride, — absence of other alkaloids except atropine and hyoscyamine—U.S.

Dose.—$\frac{1}{80}$ to $\frac{1}{20}$ grain (0·0008 to 0·0032 Gm.).

Guttæ Homatropinæ, R.O.H., St. M.'s H. and St. Th. H., 1 in 100.

Guttæ Homatropinæ cum Cocaina, R.O.H.

Homatropine Hydrobromide 1, and Cocaine Hydrochloride 2 in 100. St. Th. H. has ½ these quantities; St. M.'s H. 1 and 2½%.

'Sterules' of Homatropine Hydrobromide Solution, 4 grains to 1 ounce, are prepared, also

'Sterules' of Homatropine Hydrobromide Solution 4 grains, with **Cocaine Hydrochloride** 10 grains to 1 ounce.

Injectio Homatropinæ Hypodermica, 1 in 120, is used. *Dose.*—1 to 6 minims (0·06 to 0·35 Cc.).

Tablets, Hypodermic, contain Homatropine Hydrobromide $\frac{1}{250}$ and $\frac{1}{200}$ grain.

Sterile Capsules of Distilled Water, containing 1 drachm are prepared, and are useful for dissolving hypodermic tablets in the syringe for immediate use. This is enough to cleanse the syringe initially.

Lamellæ Homatropinæ (*Off.*) R.O.H. contain $\frac{1}{100}$ grain (0·00065 Gm.) of Homatropine Hydrobromide.

Tablets, Ophthalmic, contain $\frac{1}{400}$ and $\frac{1}{40}$ grain.

Tablets, Ophthalmic, are also prepared, containing Homatropine Hydrobromide $\frac{1}{250}$ grain with Cocaine Hydrochloride $\frac{1}{25}$ grain, and containing $\frac{1}{50}$ grain of each.

Ophthalmic Discs are also prepared containing $\frac{1}{5000}$ grain of Homatropine in each, likewise $\frac{1}{5000}$ grain, of Homatropine combined with $\frac{1}{200}$ grain of Cocaine and $\frac{1}{200}$ grain Homatropine with $\frac{1}{200}$ grain of Cocaine in each respectively.

Gelatin discs of **Homatropine and Cocaine, R.O.H** (each $\frac{1}{50}$ grain), are in demand for paralysing the accommodation.—B.M.J.E. ii./91,72.

The mydriatic and general physiological properties of Homatropine Hydrobromide resemble, but in a weaker degree, those of Atropine, excepting that it slows the heart beats and renders them irregular in force and rhythm.

Action in checking night-sweating is said to be inferior to atropine and picrotoxin. Large doses may cause staggering gait, like atropine, and delirium in children.

It enlarges the pupil and paralyses the ciliary muscles as quickly and thoroughly as an equally strong solution of atropine; but the effects of Homatropine disappear entirely in twelve to twenty-four hours, while the effect of atropine continues for many days, and while it lasts the patient is disabled from reading and writing.

A 1% solution as eye-drops for muscular asthenopia.—L. ii./99,960; B.M.J. ii./99,765.

Comparative value of the mydriatics Homatropine, Cocaine, Ephedrine, and Euphthalmine.—P.J. i./99,46.

Ephedrine Hydrochloride.

$C_{10}H_{15}NO.HCl$=200·11 (201·618 I. Wts.).

The salt of an alkaloid from *Ephedra vulgaris*, var. *Helvetica*, in shining white crystals; very soluble in water; 5 to 10% solution possesses mydriatic properties.—L. ii./98,24; B.M.J.E. ii./98,92.

Eumydrine. Methyl Atropine Nitrate.

$C_{16}H_{19}NO_3.CH_3.CH_3.HNO_3$=363·54 (366·288 I. Wts.).

A white, odourless powder, soluble in water, obtained from Atropine, is a powerful mydriatic, but less poisonous. 1% or 2% solution dilates the pupil after 25 minutes, the maximum is reached in 50 minutes. Dilatation persists for 12 hours. No ill effects.—B.M.J.E. i./04, 12. Is tolerated better than atropine.—'Ocular Therapeutics,' M.P. August, 1905.

Solution 1% suitable for use prior to estimating refraction in children or adults.—'Ocular Therapeutics,' M.P. August, 1905.

Mydrine.

Under this name a mixture of Homatropine and Ephedrine, in the proportion of 1 to 100, has been used for producing mydriasis, 10% solutions being employed. Acts quickly, but its effect is not lasting, and it produces a slight burning pain.—B.M.J.E. ii./96,32; L. ii./98, 24 173. Solution 10% is suitable as mydriatic for ophthalmoscopic examination.—'Ocular Therapeutics,' M.P. August, 1905.

'Sterules' of Mydrine Solution 10% are prepared.

Euphthalmine. *n*-Methyl-vinyl-diacetone-alkamine hydrochloride (a Mandelic Acid derivative).

A synthetic preparation which dilates the pupil by solutions of 5 to 10%, causing but little discomfort and the accommodation is but slightly disarranged. Its action has been compared to that of homatropine, but its effects pass off more quickly.—B.M.J.E. ii./98,24; B.M.J. ii./99,774; C.D.i./00,359.

Three to 5% solution with addition of 2% of cocaine hydrochloride. Recommended as rapid and having the minimal effect on the function of accommodation.—'Ocular Therapeutics,' M.P., Aug. 1905.

Guttæ Euphthalminæ, R.O.H., 2 in 100.

'Sterules' of Euphthalmine Solution 10 grains to the ounce, are prepared.

Lamellæ Euphthalminæ, R.O.H., $\frac{1}{100}$ grain in each. Solutions 2–5% dilate the pupil sufficiently for ordinary purposes, and do not irritate the conjunctiva.—Therap. 1899,326. Strength $\frac{1}{50}$ gr. are also made.

AURANTIUM.

Aqua Aurantii Floris (*Off.*). AQUA NAPHÆ, Ph. Ned. *Dose.*—½ to 2 drachms (1·8 to 7 Cc.) of the diluted water.

Distilled from the flowers of *Citrus Aurantium*, var. *Bigaradia*. Is a saturated solution of the oil, and must be diluted immediately before use with twice its volume of distilled water.

Oleum Aurantii Corticis, U.S., is expressed from the fresh peel of this plant.

Oleum Neroli. The oil obtained in the distillation of above flowers is used in perfumery. Dilution with twice its volume of absolute alcohol preserves it.

Pasta Gummosa. Resembles *Pastilles de Guimauve.*

Gum Acacia 800, Sugar in Powder 800, Water 400 or *q.s.* Mix and evaporate with agitation to the consistence of honey; beat with White of Egg 600 and evaporate further, stirring constantly at a low heat until the mass does not run from the spatula; then mix in Oil of Neroli 1 (in Alcohol *q.s.*).

Syrupus Aurantii Floris (*Off.*).

Sugar 6, Distilled Water 2, Orange Flower Water, undiluted, 1. *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.).

Cortex Aurantii (*Off.* and **Indicus, I.C. Add.**).

Dried and fresh outer peel of *Citrus Aurantium, var. Bigaradia*, the Bitter Orange (in India other varieties may be used if aromatic and bitter); from the fresh peel is now made:—

Tinctura Aurantii (*Off.*). 1 in 4 Alcohol (90%).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

U.S. 1 in 5 of Alcohol 6 and Water 4.

Mixtures containing Salts of Iron will become dark in colour with all preparations of orange peel.

Syrupus Aurantii (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Tincture of Orange 1, Syrup 7.

U S orders to triturate Magnesium Carbonate 10, with Tincture of Sweet Orange Peel 50, add Water 400, filter and wash with Water to 450. Di solve in the filtrate Citric Acid 5, and Sugar 820 without heat. Add Water to 1,000.

Fluidextractum Aurantii Amari, U.S.

Dose.—15 minims. 1=1 of Dried Peel.

Vinum Aurantii Detannatum, B.P.C.

Gelatin 1, Orange Wine 640, macerate 14 days.

Infusum Gentianæ Compositum Concentratum, B.P.C. *Dose.*—30 to 60 minims.

A Tincture 1 in 2 is made of fresh Lemon Peel 2; Gentian 2, and Orange 2, in No. 20 powder are thrice macerated 24 hours in Distilled Water 20, and pressed (or macerated in Distilled Water 15 and percolated with more to obtain 40), the first pressings (or percolate) of 10 with the Tincture of Lemon added are set aside; remainder is concentrated to 5 and added to the portion set aside with Alcohol 90% *q.s.* to make 20. Is eight times strength of B.P. infusion.

AURINARIA.

These ear cones or aural bougies are made either with Gelatin or Cacao butter basis, and are medicated:—

Aurinarium Acidi Borici 1 gr.
,, Acidi Carbolici $\frac{1}{10}$ gr.
Aurinarium Chinosol $\frac{1}{2}$ gr.
,, Cocainæ Hydrochloridi $\frac{1}{10}$, $\frac{1}{5}$ gr.
*Aurinarium Iodoform. $\frac{1}{2}$ gr.
* ,, Morphinæ Hydrochloridi $\frac{1}{10}$, $\frac{1}{5}$ gr., atque cum Cocaina $\frac{1}{10}$ gr.
*Aurinarium Morphinæ $\frac{1}{10}$, Cocainæ $\frac{1}{10}$, Acidi Borici 1 gr.
*Aurinarium Morphinæ $\frac{1}{10}$ gr., Ext. Bellad $\frac{1}{5}$ gr.
*Aurinarium Opii, $\frac{1}{5}$, $\frac{1}{2}$ gr.
* ,, Plumbi Acetatis $\frac{1}{2}$ gr., atque cum Acid. Borico 1 gr.
*Aurinarium Plumbi Acetatis et Opii $\frac{1}{5}$ gr.
*Aurinarium Zinci Sulphatis $\frac{1}{2}$ gr.
*Aurinarium Zinci Sulphocarbolatis $\frac{1}{2}$ gr.

They should be retained with a pledget of cotton wool.

AURUM.

Au = 195·70 (197·2 I. Wts.).

Physical Study of Gold. Beilby, Presidential Address Chemical Section, British Association.—P.J. ii./05,324.

For dental fillings the metal is employed in "cohesive" and "non-cohesive" form.

Auri Bromidum. $AuBr_3$ = 433·75 (437·08 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{10}$ grain (0·001 to 0·0065 Gm.)., increased to $\frac{1}{5}$ grain, well diluted.

A brown, dry powder, soluble in water 1 in 75.

In epilepsy, hysteria and migraine, is tolerated better than other bromides. Epileptics who have taken it sometimes remain for years free from attacks.

Therapeutic uses of gold salts:—In nervous dyspepsia, amenorrhœa, chronic Bright's disease, nervous disorders, vertigo; old syphilitic cases cured.—B.M.J. ii./91,1133.

Useful in alcoholic neurasthenia, but in some American 'Gold Cures' gold was absent.—B.M.J.ii./92,48,85; L.ii./92,106,285.

Inebriety: the 'Gold Cure' combined with Daturine, Strychnine, &c., is successful.—B.M.J. i./04,1008; and used in locomotor ataxy hypodermically.

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* These Aurinaria, unless ordered to the contrary, are made with cacao butter. The others are supplied with gelatin. Cacao butter basis with wax is more suitable for export to the tropics.

Liquor Auri et Arsenii Bromidi.

Auric Bromide 1½ grains, Oxybromide of Arsenium 3 grains (or Clemens' Solution [*q.v.*] 192 minims), Distilled Water to 1 ounce. *Dose.*—5 to 10 minims (0·3 to 0·6 Cc.). Another formula.—P.J. ii./96,111.

Liquor Auri et Hydrargyri Bromidi.

Auric Bromide, Mercuric Bromide, of each 1½ grains, Distilled Water to 1 ounce. *Dose.*—5 to 10 minims (0·3 to 0·6 Cc.).

Given for neurasthenia, epilepsy, syphilis, and acne.—N.Y. Med.J. 1893,435; Med. Ann. 1895,10.

GOLD CHLORIDE, VARIETIES OF, IN COMMERCE.

Auri Tri-Chloridum (Purum), $AuCl_3 = 301{\cdot}27$ (303·55 I. Wts.). Contains about 65% Au. and is official in Codex and the Portuguese Pharmacopœia. This salt is employed in France, but very little in use in this country, and is not now manufactured here.

Auri Chloridum Fuscum. A brown variety of the above, as distinct from the yellow crystals, is also sold. It contains xH_2O.

Auri Tri-Chloridum Acidum.

$AuCl_3.HCl.4H_2O = 408{\cdot}98$ (412·072 I. Wts.).

Dose.—$\frac{1}{64}$ to $\frac{1}{16}$ grain (0·001 to 0·004 Gm.), increased to $\frac{1}{4}$ grain. In yellow crystals; contains about 50% of gold. Is easily soluble in water and alcohol.

This salt is difficult to handle and not obtainable in a general way in commerce. Has been given as an alterative for phthisis and lupus.

Auri et Sodii Chloridum. Gold and Sodium Chloride. $AuCl_3.NaCl,2H_2O = 395{\cdot}10$ (398·082 I. Wts.). (Codex.)

Dose.—$\frac{1}{30}$ to $\frac{1}{12}$ grain (0·0022 to 0·0054 Gm.), increased to $\frac{1}{2}$ grain in a pill with kaolin ointment.

This is the ordinary **Commercial "Chloride of Gold,"** *e.g.*, the "Scales" Brand, as largely used in photography. An orange-yellow crystalline, deliquescent powder, soluble 1 in 2 of water, only partially soluble in alcohol. The Codex preparation contains a *molecule of each* salt combined, yielding approximately 50% of metallic gold. The U.S. preparation is a mixture of *equal parts by weight* of the two salts; it and that

of P.G.III. yield 30% of gold. This 30% product is not largely used in this country. It is sometimes used as a caustic, and given internally for syphilis. Combined with strychnine it is useful in neuroses.

Finally we have **Commercial Chloride of Gold and Sodium** consisting of Auri et Sodii Chloridum (50% Au) mixed with an equal weight of sodium chloride. It contains, therefore, 25% Au approximately.

Lupus successfully treated by hypodermic injection of chloride of gold with cyanide of potassium; doses from $\frac{1}{1000}$ to $\frac{1}{100}$ grain of each.—B.M.J.E. i./91,166.

Auri Cyanidum. $Au(CN)_3 + 3H_2O = 326{\cdot}89$ (329·368 I. Wts.). Auric Cyanide. *Dose* — $\frac{1}{60}$ to $\frac{1}{12}$ grain (0·001 to 0·005 Gm.). Colourless hygroscopic powder. Has been given to consumptives and for lupus.

Liquor Sodii Auratis. A solution of 1 Gm. of Commercial Chloride of Gold is dissolved in 50 Cc. of water, to which 5% Sodium Hydrate Solution is added to render faintly alkaline. To this is quickly added 100 Cc. of 1% Boric Acid Solution and shaken. The volume is now made up to 200 Cc. with normal Saline Solution. It is finally faintly acid in reaction.

The solution is bactericidal (alleged to be stronger than the 1:1,000 solution of Mercuric Chloride) and is dropped into the conjunctival sac and used in the urethra for gonorrhœal affections without toxic effects.—Verhoeff.

BARIUM.

Ba = 136·40 (137·4 I. Wts.).

Barium Chloratum, P.G. Barium Chloride, $BaCl_2,2H_2O = 242{\cdot}54$ (244·332 I. Wts.).

Dose.—$\frac{1}{2}$ to $1\frac{1}{2}$ grains (0·03 to 0·1 Gm.). Maximum 3 grains (0·2 Gm.), or 9 grains (0.6 Gm.) per diem.

In colourless crystalline plates, with bitter saline taste. ***Soluble*** 1 in $2\frac{1}{2}$ of water. Solution is destructive to bacteria. Mostly used for analytical purposes, but possesses cardiac, tonic and alterative properties; has been tried for syphilis and scrofula. Also 1% solution as eye wash in scrofulous inflammation. Varicose veins are treated by internal use, and applied locally over the distended vessels.—H.

Incompatible with sulphates, phosphates, tartrates and carbonates.

Barium Chloride has been found of value as a heart tonic; it lessens cardiac pain. In the form of Barium

Water (*vide* Mineral Waters) it has also been much used also for glandular swellings.

Does not derange digestive and other functions.—B.M.J.E.i./05,24.

Pharmacologically has special affinity for all forms of muscle, and taken internally acts on the plain muscle of the gut, producing (in sufficient quantity) pain, nausea, vomiting, and diarrhœa.—Dixon.

Antidote.—Sodium Sulphate.

Barutin. A specialty in white powder, with alkaline reaction, containing 9·5% Barium as chloride, 25% Theobromine and Sodium Salicylate. Possesses diuretic properties, hence often useful in cardiac dropsy. *Dose.*—4 to 8 drachms of 1·25% aqueous solution.—B.M.J.E. ii./05,95; Berl. Klin. Woch., 1905, No. 38.

Barii Nitras. $Ba(NO_3)_2$=259·56 (261·48 I. Wts.) and **Barium Acetate** $(CH_3COO)_2Ba$ = 253·56 (255·448 I. Wts.) may be employed officially in place of the chloride for testing.

Barii Sulphidum.

Dose.—½ to 1 grain in keratin coated pills.

A greyish yellow powder, soluble in water, given as an alterative in syphilitic affections.

Barium Sulphide Depilatory.

Barium Sulphide, in fine powder 1 to 3 parts.
Wheat Starch Powder ... 3 parts.

Make into a cream with water. When required for use, spread it on the part and let it remain five or ten minutes, then remove with a blunt knife. N.B.—It temporarily reddens the skin.

Another formula is Barium Sulphide 5, Powdered Soap 1, French Chalk 7, Starch Powder 7, Benzaldehyde to 24.

One part of this is mixed with 3 of water, applied to the skin and washed off after 5 minutes.

Causticum Barii, St. J. H. Barium Sulphide, Zinc Oxide, of each 2½, Starch 3.

BELLADONNA.

Deadly Nightshade (*Off.*).

All parts of the plant *Atropa Belladonna* (*Solanaceæ*) yield the alkaloids atropine and hyoscyamine. The root contains from 0·3 to 0·8% of total alkaloids. The leaves

contain 0·2 to 0·7%, principally Hyoscyamine. Methods of assay of leaves, root and extract.—P.J. ii./00,195; i./03,268.

Farr and Wright have found a minimum of 0·14 and a maximum of 1·32% (exceptional) total alkaloids in the leaves, an average of 0·547%—rather more than is generally found in the root.—P.J. i./05, 398; C.D. i./05, 425.

Antidotes.—See Atropine. Poisoning by belladonna is well treated by pilocarpine.—B.M.J. ii./93,12.

Belladonnæ Folia, U.S., contain not less than 0·35% mydriatic alkaloids. *Dose.*—1 grain.

C.U.D. suggests the leaf only to be used dried. If powdered to be used without separation of any residue.

Belladonnæ Radix, U.S. 0·5% mydriatic alkaloids. *Dose.*—¾ grain (0·045 Gm.). P. Austr. Ash 6%.

U.S. Assay.—The powdered leaves, or root (10 Gm.) are shaken with chloroform, ether and ammonia, and percolated into a volume of N. sulphuric acid. The acid solution combined with that obtained by a further washing of the percolate with an additional quantity of sulphuric acid is made distinctly alkaline and shaken out with chloroform. The chloroform is evaporated, and the residue dissolved in ether. The alkaloidal residue from this is dissolved in 3 Cc. of $\frac{N}{10}$ sulphuric acid, and back-titrated with $\frac{N}{50}$ potash, using hæmatoxylin or iodeosin as indicator. The factor 0·0287 is provided for arriving at the percentage of mydriatic alkaloids.

Uses.—Externally relieves the pain of rheumatism, neuralgia, chordee, and local inflammations, as of the breast. In leucorrhœa, vaginal injection of Tincture 3, Sodium Bicarbonate 1, and Water 100 useful.—R.

Internally relieves spasm, palpitation, menstrual pain, headache, whooping cough, checks profuse perspiration, and incontinence of urine. In acute sore throat. Acts on the eye as a mydriatic.

Relieves the dyspnœa of asthma.—M.A. 1906,132.

Belladonna is advocated for treating heart failure in diphtheria.—L. i./06,282.

As to the administration of Belladonna, according to Ringer: "A scarlet rash often breaks out on the skin, a rash said to be like that of scarlet fever." The local application of Belladonna also produces in some persons a general red rash with redness of the throat and dilated pupils. Similarly, Lauder Brunton says: "Locally applied it can be absorbed from the skin and produce

its general symptoms." After full doses (*i.e.* internally) the pupils become dilated and a red rash appears on the skin like that of scarlatina."

Rabbits and other herbivorous animals are very insusceptible to belladonna, but when rabbits treated with the drug are eaten by man, poisonous symptoms may arise.—Dixon.

Chloroformum Belladonnæ, B.P.C.

Belladonna Root, in No. 60 powder			20 ounces.
Strong Solution of Ammonia	...		1½ ,,
Distilled Water ...	...	...	20 ,,
Chloroform	...	...	*q.s.*

Macerate the belladonna with the ammonia and water, previously mixed, for 4 hours, dry, and again reduce to No. 60 powder. Macerate for 24 hours with 20 ounces of chloroform in a percolator provided with a tap, then percolate slowly, adding more chloroform until 30 ounces are obtained. Mixes with oils; 1 to 3 of olive oil is useful for painful rheumatic affections.

Collodium Belladonnæ. — *Syn.* **Emplastrum Belladonnæ Fluidum, B.P.C.**

Alcoholic Extract of Belladonna Leaf 960 grains (or sufficient to yield ½% of alkaloid in the collodion), Rectified Spirit 9 ounces, dissolve and add Pure Ether 9 ounces. After 12 hours decant, dissolve in the mixture Camphor 130 grains, Pyroxylin ½ ounce, and add sufficient spirit and ether, in equal volumes, to 20 ounces.

Emplastrum Belladonnæ (*Off.*).

Liquid Extract of Belladonna 4, evaporate to weigh 1 (or less), and add Resin Plaster, previously melted, 5 (or *q.s.* to 6). Contains 0·5 % of the alkaloids of Belladonna root.

Poisonous symptoms from the B.P. 1885 plaster.—B.M.J. i./99,849,952; *vide also* B.M.J. i./03,1141.

Applied to the back for lumbago.—L. i./05,714.

Many cases of virulent skin irritation, erythema, and toxic symptoms have been noted as due to the use of this official plaster, especially when applied to the breast. This plaster is only half the strength of that of the B.P. 1885, but it is even now too strong to be used with safety. *Equal parts of this plaster and resin or soap plaster would be preferable.*—P.J. i./03,869,903.

A good method of estimation.—P.J. ii./99,147.

Belladonna Plasters, spread, plain and porous,

7 inches wide, yard rolls; also on red felt, porous, 7 inches wide, yard rolls.

Emplastrum Belladonnæ Extensum.

Belladonna plaster in rubber combination spread on calico in porous sheets 7 in. by 5 in. and in yard rolls 7 in. wide, porous and non-porous (*American*).

Similar plasters are also prepared with belladonna and aconite combined.

Plaster mulls are spread containing 10 grammes of Belladonna Extract in $\frac{1}{5}$ square metre.

Emplastrum Belladonnæ Viride, B.P.C.

Mix Alcoholic Extract of Belladonna Leaf, *q.s.* = 11 grains of Alkaloids and Resin Plaster (melted) *q.s.* to 10 ounces. Contains 0·25% of Alkaloids, and is only half the strength of the B.P. Emplastrum Belladonnæ.

Emplastrum Belladonnæ U.S. Contains not less than 0·38 nor more than 4·2% alkaloids, and is prepared with Extractum Belladonnæ Foliorum (1·4% alkaloids) 300, Emplastrum Adhæsivum 700. Assay method given.

Extractum Belladonnæ Viride (*Off.*).

Dose.—"$\frac{1}{4}$ to 1 grain" (0·016 to 0·065 Gm.), increased to 2 grains or more.

A green extract prepared from the expressed juice of leaves and young branches (3 to $3\frac{1}{2}$ ounces are procurable from a pound of leaves); it contains from 0·5 to 2·0% (average 1) of alkaloids, and might be standardised to contain 1%. For methods, *see* P.J. i./94,740; ii./97,517; ii./98,165.

Extractum Belladonnæ Alcoholicum (*Off.*).

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.).

A brownish powder; prepared by concentrating the liquid extract of belladonna by evaporation and mixing with milk sugar, so that 20 of liquid extract yield 15 of product in powder. It contains 1% of the alkaloids of belladonna, and is only about one-third strength of the preparation in B.P. 1885.

Extractum Belladonnæ should be a "solid" extract (containing about 10% of water) prepared by means of alcohol 70% apparently from the leaf. Alkaloidal strength "hereafter."—Recommendation of C.U.D.

In the official process of assay, the fatty matter should be first removed by shaking the sample (acidified) with chloroform.—P.J. i./99, 432. Modes of assay.—P.J. i./03, 268.

Ether preferred to chloroform as the immiscible solvent,

and a little tragacanth may be added to assist separation. —P.J. ii./00, 195; Y.B.P. 1901, 40.

Extractum Belladonnæ Folii Alc., B.P.C.

Solid extract made with alcohol 90%, contains about 5% of alkaloids. **Extractum Belladonnæ Foliorum**, U.S., made with 2 parts alcohol and 1 water as solvent. Contains 1·4% mydriatic alkaloids.

Belladonnæ Folia, P. Austr., should yield 15% of spirituous extractive.

"**Extractum Belladonnæ**," P. Austr., is alcoholic from the leaves and contains 2% alkaloids; **Ph. Ned.** is also alcoholic from the leaves and contains not less than 1·15% alkaloids. **P. Belg.** contains 1·5% alkaloids.

The average yield was found by Farr and Wright to be 1%. The stronger the alcohol used the better the extraction—using 90% alcohol, 4% alkaloids were obtained against 2·15% only when employing 50% alcohol.

For **powdered extract**, powdered leaves recommended as diluent; should be well dried first, and must contain sufficient alkaloid to permit of their being used in the proportion of 2 of diluent to 1 of extract. This keeps well.—P.J. i./05,398; C.D. i./05,425. The use of dried exhausted marc would greatly simplify.—Deane.

Extractum Belladonnæ Liquidum (*Off.*).

Dose.—$\frac{1}{3}$ to 1 minim (0·002 to 0·06 Cc.).

Belladonna root in No 20 powder, 8 parts, is percolated in 4 successive portions with 30 parts of a mixture of Alcohol 7, Distilled Water 1; collecting $12\frac{1}{2}$ parts of the final percolate. This is diluted with the menstruum, adjusting the strength so that the liquid extract contains 0·75% of alkaloids.

To prevent emulsification in assay process remove the fat as much as possible, either by the B.P. method or by Alcock's process—preliminary removal of fatty matter with ether and the precipitation of resinous matter with chloroform.—P.J. ii./05,124. Recent note on manufacture.—Dott P.J., July 28, 1906, *p.* 99.

Fluidextractum Belladonnæ Radicis, U.S.

Average dose.—1 minim. (0·05 Cc.). Hydro-alcoholic percolate; contains 0.5 Gm. mydriatic alkaloids in 100 Cc. Assay on lines of belladonna root, *v.p.* 169.

Glycerinum Belladonnæ, B.P.C.

Green Extract of Belladonna, 1 ounce; Boiling Distilled Water, 1 drachm. Rub in a warm mortar to a smooth paste, and add Glycerin, *q.s.*, to 2 ounces (fluid).

To check pain and inflammation, is often painted on boils, abscesses, and carbuncles, and, covered with a

poultice, also applied on lint to the breasts to disperse milk. G.H. is one-third weaker. R.O.H. orders 3½ oz. of glycerin to the ounce of extract.

Marked intolerance to,—40 minims applied in cellulitis of foot produced all the symptoms of belladonna poisoning.—L. i./06,596.

Linimentum Belladonnæ (*Off.*).

Camphor 1, Alcohol (90%) 6. Dissolve and add Liquid Extract of Belladonna 10, Distilled Water 2, Alcohol (90%) *q.s.* to 20. A useful topical sedative for neuralgia and rheumatic pains. It contains 0·375% of alkaloids.

Poisoning by above, pilocarpine an antidote.—B.M.J. i./81,594; i./90,420,720; i./97,1219; L. ii./90,175.

U.S. has Camphor 5, Fluidextract of Root to 100.

Linimentum Belladonnæ Compositum.

Liniment of Belladonna 7, Chloroform of Belladonna 1. Sprinkled on impermeable piline relieves lumbago.

St. M.'s H. has Belladonna Liniment 1, Compound Camphor Liniment 1.

Linimentum Belladonnæ cum Chloroform, St. M.'s H. Chloroform Liniment 1, Soap Liniment 1, Belladonna Liniment 2.

Pilula Quininæ cum Belladonna, R.O.H.

Green Extract of Belladonna ⅛ grain, Quinine Sulphate 1 grain, Confection of Roses *q.s.*

Pulvis Hydrargyri cum Creta, et Belladonnæ, R.O.H. *Dose.*—5 grains (0·32 Gm.).

Mercury with chalk 2 parts, Belladonna Leaves, in powder, 1 part, Sugar, in powder, 2 parts.

Succus Belladonnæ (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.). Expressed juice of leaves and branches with one-third of 90% alcohol added.

Alkaloidal strength about 0·05%.

Hay fever is relieved by one minim every hour.

Suppositoria Belladonnæ (*Off.*).

Contain Alcoholic Extract of Belladonna 1½ grains (0·1 Gm.), with Oil of Theobroma *q.s.*

Pessaries may also be made containing the same or double the quantity of extract. *Vide also* Ovules.

Unilateral convulsions produced by, together with

usual dryness of throat, dilated pupils (special idiosyncrasy).—B.M.J. i./06,1019.

Suppositoria Belladonnæ ½ grain, **et Morphinæ Hydrochloridi** ¼ grain.

These possess a useful sedative effect, and are valuable in irritated and painful conditions of the rectum and prostate and for chordee.

Tinctura Belladonnæ (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Liquid Extract of Belladonna 1, Alcohol (60 per cent.) *q.s.* to 15. Is about double the alkaloidal strength of that in B.P. 1885.

Uses.—Relieves the spasm of asthma and bronchitic cough; also bladder spasm set up by calculi and prostatic irritation. Full doses are very useful for incontinence of urine.

Tablets are prepared equivalent to 2 and 5 minims.

U.S. has 1 of Standard Leaves (0·35% alkaloids) in 10 of diluted alcohol, assayed to 0·035%.

Should be 10% by percolation with alcohol 70% with dried leaf only (C.U.D.): would be a retrograde step owing to variation of the crude drug.—B.M.J. i./03,29.

Appendicitis has been treated by full doses (10 to 15 minims) with sodium salicylate.

Exophthalmic goitre satisfactorily treated with belladonna, liquor arsenicalis, bromide, and digitalis.—B.M.J. i./06,914.

In enuresis valuable, especially with potassium citrate.—B.M.J. i./06,903.

Tinctura Belladonnæ Ætherea.

Prepared with Ether, 1 in 1½, with Camphor $\frac{1}{20}$. Recommended in place of liniment for quicker absorption.—L. ii./90,67; P.J. 1890,84.

Unguentum Belladonnæ (*Off.*).

Liquid Extract of Belladonna 8, evaporate to 1, and add Benzoated Lard 9. Contains 0·6% alkaloids.

U.S. Extract of Belladonna Leaves 2, Alcohol 1 (48·9% volume), Hydrous Wool Fat 4, Benzoated Lard 13.

To lessen excessive secretion in nasal catarrh, this ointment has been employed diluted 5 to 10 times with soft Petroleum and a small proportion of Tannin or Gallic Acid added.

BISMUTHUM.

Bi = 207·30 (208·5 I. Wts.).

The absorbent action of the preparations of bismuth taken internally is increased by combination with antiseptic organic compounds. These combinations have been much recommended in those disorders of the digestive tract in which several infectious diseases make their early manifestations. Thus the salicylate, and naphthol, phenol, pyrogallol and bromophenol compounds have been brought into use. These check the fermentative processes forming ptomaines, yet, it is said, do not interfere with intestinal digestion. Bismuth compounds are in general ***incompatible*** with potassium iodide, the insoluble brown bismuth tri-iodide being formed.

Bismuthi Benzoas, Bismuth Oxybenzoate.

$C_6H_5 - CO.O(BiO)$ (? Schmidt) = 343·31 (345·54 I. Wts.).

Dose.—5 to 20 grains (0·3 to 1·2 Gm.) thrice daily.

A white powder insoluble in water. Codex requires 64 to 65% Bismuth Oxide.

Antiseptic, internally in gastro-intestinal diseases, externally as a dusting powder to chancroid, indolent and sloughing ulcers.

Bismuthi Carbonas.

$(Bi_2O_2CO_3)_2.H_2O$ = 1029·70 (1036·106 I. Wts.).

Syn. Bismuth Oxycarbonate (*Off.*). Bismuthi Subcarbonas, U.S.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Suspended in an ounce of water by means of a drachm of mucilage of tragacanth or about 6 grains of compound powder of tragacanth.

Ninety per cent. of the Hospital Pharmacopœia Formulæ for Bismuth mixtures contain a suspending agent. Prescribers would do well to indicate their intentions in this matter to ensure uniformity in dispensing.

The following forms an agreeable dose :—

Mistura Bismuthi.

Bismuth Oxycarbonate 10 grains, Sodium Bicarbonate 10 grains, Mucilage of Tragacanth 1 drachm, Compound Tincture of Cardamoms 30 minims, Spirit of Chloroform 10 minims, Cinnamon Water to 1 ounce.

St. M.'s H. has Bismuth Subnitrate 20 grains, Tragacanth Mucilage 1 drachm, Peppermint Water to 1 ounce.

Tablets of Bismuth Carbonate, 5 grains, to be crushed and swallowed with a little water.

Bismuth Subcarbonate is the best salt as a gastric sedative, preferable to the subnitrate or salicylate. The subnitrate is found to have distinct germicidal action on *B. coli*, hence best as intestinal antiseptic. For astringent effect preferred with catechu to the subgallate.—L. i./05,432.

Sedeff. *Dose.*—1 to 2 drachms in water. Contains opium, bismuth and digestive ferments. A palatable, granular effervescent preparation, suggested for use in sickness and derangement of digestive functions.

Pastillus Bismuthi Carbonatis (3 grains) **cum Morphinæ Acetate** ($\frac{1}{40}$ gr.), *v.p.* 370.

Collapsubes (with rectal tube attachment) of Bismuth 20%, Morphine $\frac{1}{2}$%, and Cocaine 3% Ointment with soft paraffin basis, are useful as an astringent in hæmorrhoids and for allaying irritation.

Liquor Bismuthi et Ammonii Citratis. *Syn.* **Liquor Bismuthi** (*Off.*).

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

Contains 5 grains of citrate = 3 grains of oxide of bismuth in 1 drachm; is apt to become fungoid. The precipitate by B.P. method of making should be washed rapidly without unnecessary exposure. Sterile materials and utensils should be used. The potassium citrate must be pure, and the solution of ammonia must be quite free from tarry matter. Test for the latter by adding 2 to 3 Gm. of copper sulphate to the ammonia solution until it smells very slightly of ammonia; tar constituents will colour it.—C.D. i./05,708.

Evaporated to a syrupy consistence and spread on glass and dried, it produces soluble—

Bismuthi et Ammonii Citras, U.S.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

In shining pearly or translucent scales, 1 Gm. yields not less than 0·48 Gm. Bi_2O_3.

Lac Bismuthi, *Symes.* *Dose.*—1 to 2 drachms.

A preparation of bismuth hydroxide. May be prescribed with hydrocyanic acid, alkalis, &c.

Liquor Bismuth Sedativa, *Schacht.* *Syn.* **Bisedia.**

Dose.—1 drachm.

Containing bismuth and pepsin with $\frac{1}{24}$ grain morphine hydrochloride, 2 minims of hydrocyanic acid, and 5 minims of tincture of nux vomica.

Bismuthi Citras, U.S. $BiC_6H_5O_7$=394·92 (397·54 I. Wts.), (394·52 U.S. Wts.).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

A white crystalline powder, almost insoluble in water and alcohol 90%, but soluble in solution of ammonia. It has astringent and stomachic properties.

Elixir Bismuthi. *Dose.*—1 drachm (3·5 Cc.).

Bismuth Citrate 1, Distilled Water 6, Solution of Ammonia ¾ or more if needed to dissolve the bismuth. Dissolve, filter and add Simple Elixir *q.s.* to 30.

Liquor Bismuthi Concentratus, B.P.C.

Dose.—15 to 30 minims.

Bismuth Subnitrate, 7, dissolve with heat in Nitric Acid and Water of each 5, when cold add citric acid 5, dissolved in Water 7, then gradually Sodium Bicarbonate 8¾, mixed with Water 7. Wash the precipitate till free from nitrates, collect and dissolve it in Solution of Ammonia 6 or *q.s.*, Solution of Ammonium Citrate 12, add Distilled Water *q.s.* to 50. Filter.

Mistura Bismuthi Composita, B.P.C.

Dose.—20 to 30 minims (1·2 to 1·8 Cc.).

Morphine Hydrochloride 8 grains, Distilled Water 4 drachms, Compound Tincture of Cardamoms 3 ounces, Chloroform 70 minims, Liquid Extract of Nux Vomica 135 minims, Diluted Hydrocyanic acid 320 minims, mix, add Concentrated Solution of Bismuth 15 ounces, and Water *q.s.* to 1 pint. Unsatisfactory in colour and precipitates.

Mistura Bismuthi cum Pepsina.

Dose.—1 drachm diluted.

Contains Bismuth Citrate 2 ounces, Pepsin (soluble) 320 grains, Morphine 5 grains, Strychnine 1½ grains. Dilute Hydrocyanic Acid 320 minims, Chloroform 80 minims, Carmine Solution 80 minims, Saccharin Elixir 480 minims, Water to one pint. If made *secundum artem* this mixture will not deposit. Tocher finds fault with this class of preparation.—P. J., July 28/06, *p.* 88.

Tabellæ Bismuthi et Pepsinæ.

Bismuth Carbonate 3 grains, Pepsin 3 grains, in chocolate basis. Also Compressed Tablets.

Bismuthi Iodo-Resorcin-Sulphonas. *Syn.* ANUSOL. In **Suppositories** for hæmorrhoids.

Bismuthi Nitras Crystallisatum, $Bi(NO_3)_3$, $5H_2O$=481·44 (484·7 I. Wts.).

Dose.—5 to 10 grains (0·3 to 0·65 Gm.).

In colourless deliquescent crystals, which if dissolved in a small quantity of water give a solution with an acid reaction, this on further dilution throws out basic

bismuth subnitrate, is practically insoluble in Alcohol 90%, but soluble in cold glycerin. It is astringent and antiseptic, and useful for the diarrhœa of phthisis.

Complex bismuth nitrites are producible as precipitates with ammonium, sodium, and potassium nitrites.

Bismuthi Oxidum, Bi_2O_3=462·24 (465 I. Wts.). (*Off.*). *Dose.*—5 to 20 grains (0·32 to 1·3 Gm.).

Is prepared by boiling bismuth subnitrate in solution of soda, washing and drying the deposited dull lemon-yellow-coloured bismuth oxide. May with advantage be precipitated with acid from an alkaline solution containing glycerin.

Anderson's Ointment.

Bismuth Oxide 1, Oleic Acid 8, White Wax 3, White Soft Paraffin 9. In pruritus.

Bismone is Colloidal Bismuth Oxide.—F.N. 1906, 35.

Bismuthi Oxybromidum, BiOBr. = 302·53 (304·46 I. Wts.).

Dose.—5 to 7 grains (0·3 to 4·2 Gm.).

A yellowish insoluble powder. A useful sedative in nervous dyspepsia and vomiting.

Bismuthi Oxychloridum, BiOCl = 258·37 (259·95 I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Is much used as a cosmetic, pearl white or 'blanc de perle.' It gives a white pearly gloss to the skin. It is an impalpable, insoluble, neutral, unirritating powder, suitable for internal administration to produce a coating on the irritated parts of the stomach or bowels. From a quarter to half a grain may be used as an insufflation to the larynx.

Pessaries or **Suppositories** may be made with Oil of Theobroma, containing 10 grains (0·65 Gm.) of the oxychloride in each.

Unguentum Bismuthi Oxychloridi.

Bismuth Oxychloride 1, Vaseline 15.

Is useful for anointing the speculum previous to vaginal examinations.

Bismuthi Oxyiodidum, BiOI = 349·08 (351·47 I. Wts.). *Dose.*—5 to 10 grains (0·32 to 0·65 Gm.).

A brownish red amorphous powder, with slight iodine odour, insoluble in water, alcohol or ether.

Contains 66% bismuth oxide approximately. Has been applied as an antiseptic to ulcerous sores in place of iodoform, and injected in suspension in 100 parts of water for gonorrhœa; also as an ointment for rectal affections. Internally used for ulcer of the stomach.

Bismuthi Phosphas. *Syn.* BISCOL.

Dose.—3 to 8 grains (0·18 to 0·5 Gm.).

A soluble white powder is sold which is probably a mixture of Bismuth Phosphate and Sodium Pyrophosphate, contains about 20% Bismuth Oxide. Is used as an intestinal antiseptic and astringent in acute gastric or intestinal catarrh.

Bismuthi Salicylas, Bismuth Salicylate, Bismuth Oxysalicylate, $C_6H_4.OH.COO.BiO$ = 359·19 (361·54 I. Wts.) (*Off.*). P.G.iv. U.S. P. Austr.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

A white or nearly white powder, obtained by the decomposition of true bismuth nitrate and a solution of sodium salicylate; is insoluble in water, alcohol, and glycerin, yields on incineration about 64% of Bismuth Oxide. Has been used with advantage in some forms of diarrhœa, typhoid fever, and gastric catarrh, and as a substitute for iodoform.

Tablets, 5 grains (0·32 Gm.). *Dose.*—1 to 4.

Suppositories of Bismuth Salicylate, 10 grains.

A useful astringent in dysentery.

Bismuthi et Cerii Salicylas.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

A double salt, resembling the above, has also been recommended for sickness, diarrhœa, dysentery, and ulceration of the bowels.

Lac Bismuthi et Cerii is sold as a specialty.

Dose.—One to two drachms.

Bismuth Sulphocarbolate or **Sulphophenate.**

Dose.—4 to 8 grains (0·26 to 0·52 Gm.) in cachets.

A red-tinted whitish powder slightly soluble in water, useful in intestinal affections.

Diarrhœa and Cholera Mixture. (*Board of Health.*)

Aromatic Confection 9 grains, Aromatic Spirit of Ammonia 9 minims, Tincture of Catechu 30 minims, Compound Tincture of Cardamoms 18 minims, Tincture of Opium 3 minims, Chalk Mixture to 1 ounce (= 1 dose).

Thioform, a basic dithio-salicylate of bismuth, is a brownish white insoluble powder, inodorous, has been used as a desiccant antiseptic for eye cases.

Bismuthi-Subnitras, MAGISTERIUM BISMUTHI, Ph. Ned., $BiONO_3,H_2O = 302{\cdot}64$ (364·556 I. Wts.). (*Off.*).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Is prepared by the addition to water of crystals of bismuth nitrate, and generally levigated afterwards.

Yields not less than 80% Bi_2O_3 (U.S.).

Incompatibility.—This preparation from its nature is always *acid* in reaction; it is therefore incompatible with alkaline carbonates—many bottles of medicine so prescribed burst in time; also decomposes Potassium Iodide, and incompatible with Tannin and Sulphur. Best suspended in aqueous vehicle by compound tragacanth powder 1 drachm to 8 ounces.

Some however prefer mucilage of acacia, particularly if (i.) freshly made from powdered gum; (ii.) the mucilage be diluted with half the menstruum and poured into the bottle first; (iii.) the bismuth be well e'utriated with the menstruum, added in small quantities to the mucilage in the bottle.—Cowley.

Uses.—As a dusting powder in ophthalmic practice, and in gastric ulcer and dysentery. Suspended is injected for gonorrhœa.

Suppositorium Bismuthi, U.C.H., has of this salt 10 grains, with Oil of Theobroma 13 grains to make a suppository.

Tablets, 5 to 10 grains (0·32 to 0·64 Gm.).

Dragendorff's Test for Alkaloids.—Bismuth Subnitrate 8, Nitric Acid, Sp. Gr. 1·18, 20; add this solution gradually to a concentrated solution of Potassium Iodide 22·7. Cool, decant from Potassium Nitrate formed and dilute to 100 with water. The solution precipitates most alkaloids.

Trochisci Bismuthi Compositi (*Off.*). (Rose basis.)

Bismuth Oxycarbonate 2 grains, Heavy Magnesium Carbonate 2 grs., Precipitated Calcium Carbonate 4 grs.

Pulvis Bismuthi Compositus (Ferrier's Snuff).

Morphine Hydrochloride 1, Powdered Acacia 60, Bismuth Oxynitrate 180.

From 1 to 3 drachms to be used as snuff in 24 hours for catarrh. For acute coryza, add powdered cubebs.

Bismuthi Oxy-Iodogallas.

$C_6H_2(OH)_3COOBi<^{OH}_{I}$ =517·85 (521·318 I. Wts.).

Syns. AIROL, AIROFORM, AIROGEN.

A light greyish-green powder, odourless, non-irritant. Is an iodoform substitute as dusting powder, or ointment for ulcers, lupus, leprosy, boils, whitlows, chancres, and for intertrigo.

Bismuthi Subgallas, $C_6H_2.(OH)_3CO.O.(BiO), H_2O$ or $Bi(OH)_2C_7H_5O_5$ = 408·83 (411·556 I. Wts.).

Syn. DERMATOL; BISMUTHUM SUB-GALLICUM, **P.G.iv.** 52% Bi_2O_3; **U.S.** 52–57%; **P. Austr.** 53–55% Bi_2O_3.

Average dose (U.S.)—4 grains.

An odourless yellow, insoluble, non-irritant antiseptic dusting powder, employed alone or with starch.

Given internally for diarrhœa with good results, in doses of 30 to 90 grains daily.—P.J. 1892,3.

Ten per cent. ointment with vaseline recommended for burns and eczema of children.—B.M.J.E. i./92,52.

Emulsion of Dermatol **2**, Gum Acacia 2, Water 25. Used in gonorrhœa, good results.—P.J. ii./00,30.

Collapsubes (*v.p.* 292), with catheter attachment, of **Dermatol Ointment**, 10%, with paraffin basis are prepared, and are useful in gonorrhœa.

Bismuthi Tannas.

Dose.—10 to 30 grains (0·65 to 2 Gm.)

A yellow powder insoluble in water, is astringent, and useful in diarrhœa and dysentery.

Bismutose. *Dose.*—15 to 30 grains for children, adults by the teaspoonful. A compound containing about 20% of bismuth with 60% of albumen; useful in gastric ailments.—B.M.J.E. i./02,44.

Naphthol-Bismuth. BASIC BISMUTH BETA-NAPHTHOLATE. *Syn.* ORPHOL.

$Bi_2O_2(OH)C_{10}H_7O$ = 605·22 (609·064 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

Is less irritating than naphthol to the stomach and intestines, in which it acts as a useful antiseptic and astringent.—P.J. ii./95, 391.

Phenol-Bismuth.

$Bi(OH)_2C_6H_5O$=333·40 (335·556 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

A greyish insoluble powder, containing about 20%

of phenol, combined with bismuth oxide. Acts slowly on the digestive tract and does not cause carboluria. Has a similar action to last preparation.

Pyrogallol - Bismuth, $C_6H_3\begin{cases}(OH)_2\\O.BiO\end{cases}$ or

$C_6H_3(OH)O_2BiOH = 347{\cdot}28$ (349·540 I. Wts.)

(*vide* also p. 175.) has internal action similar to Salol.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

BOUGIES.

Nasal Bougies are termed **Buginaria**. These are of elastic gelatin basis, and are $3\frac{3}{16}$ inches in length and are medicated with **Carbolic Acid, Cocaine Hydrochloride, Copper Sulphate, Iodoform and Zinc Sulphate.** For strengths, *see* Index.

Urethral Bougies. These are, *firstly*, of gelatin basis in *two* lengths, namely, $2\frac{1}{2}$ inches and 4 inches, and are directed to be dipped in warm water prior to insertion. For various contents, *see* Index. (U.S. orders 7 Cm.=$2\frac{3}{4}$ inches, weighing about 2 Gm., and 14 Cm.=$5\frac{1}{2}$ inches, weighing about 4 Gm. respectively.) *Secondly*, of Cacao Butter of *any* length up to 6 inches if desired, and of six sizes, with the following diameters:—No. 1, $\frac{1}{8}$ inch; No. 2, $\frac{5}{32}$ inch; No. 3, $\frac{3}{16}$ inch; No. 4, $\frac{7}{32}$ inch; No. 5, $\frac{1}{4}$ inch; No. 6, $\frac{5}{16}$ inch. These are for the treatment of gonorrhœa in its various stages. Those of Cotarnine (*q.v.*) are used to check bleeding.

The **U.S. Urethral Bougies** made with Oil of Theobroma are 7 Cm. and 14 Cm. long and weigh about 1 and 2 Gm. respectively.

Gerrard on a new method of moulding bougies.—P.J., July 28, 1906, *p.* 102.

BROMUM, U.S.

Br=79·35 (79·36 U.S.) (79.96 I. Wts.).

A dark brown liquid Sp. Gr. 2·99 with penetrating odour. Solubility 1 in 30 of water. Is not used as such medicinally.

Glass Capsules, 1, 2·2, and 4 Cc. and *Liquor Bromi*, *v.p.* 661.

The following medicinal inorganic **Bromides** contain the halogen in these proportions:—Ammonium Bromide

(NH_4Br=97·29) 81·63% Calcium Bromide U.S. ($CaBr_2$ = 198·41 B.P. Wts.) 80%, Lithium Bromide U.S. (LiBr=86·32 B.P. Wts.) 91·92%, Potassium Bromide KBr=(118·18) 67·2%, Rubidium Bromide (RbBr= 164·16 U.S. Wts.) 48·3%, Sodium Bromide, B.P. (anhydrous) (NaBr = 102·23) 77·6%, Strontium Bromide U.S. ($SrBr_2 + 6H_2O$ = 352·94 U.S. Wts.) 44·97% (if exsiccated about 64·6%), Zinc Bromid: U.S. (ZnB_2 = 223·62 U.S.Wts.) 70·9%.

Magnesii Bromidum ($MgBr_2 + 6H_2O$ = 290·16) contains 54·9% of Bromine, given in doses of 10 to 20 grains (**0·65 to 1·3 Gm.**) for hysteria and epilepsy as a nervine sedative. Soluble 1 in 0·6 of water and 1 in 2 of alcohol 90%.

Manganesii Bromidum ($MnBr_2 + 4H_2O$=284·74) contains 55·7% of Bromine, and is given in doses of 1 to 3 grs. (**0·06 to 0·5 Gm.**) as a nervine tonic. It is soluble 1 in less than 1 of water and alcohol. Both of these may contain less water of crystallisation.

Calcii Bromidum. $CaBr_2$ U.S.=(198·52 U.S. Wts.) 97% pure. *Dose.*–10 to 20 grains (**0·65 to 1·3 Gm.**)

A white crystalline powder soluble 1 in 0·3 of water and about 1 in 0·6 of alcohol 90%. Has been given in epilepsy with good results.

Bromal. CBr_3COH.=278·75 (380·888 I. Wts.). A yellow liquid miscible with water and ether. Sp. Gr. 2·3, has similar properties to the following, which is most used.

Bromal Hydras. Bromal Hydrate. $CBr_3.COH.H_2O$=296·63 (298·904 I. Wts.).

Dose.—2 to 5 grains (**0·13 to 0·32 Gm.**) at bedtime for relieving pain or producing sleep.

In large oblique colourless prisms, which melt on the hand. It is not quite so soluble or readily soluble in water as chloral hydrate. Applied externally to the skin, it causes irritation and great infiltration of the tissue, as when dry cupping-glasses are used. Being much more active physiologically than chloral hydrate it is not suitable for internal administration, as it causes pyrosis, vomiting, and diarrhœa. It has been tried in epilepsy.

Bromalbacid.

Dose.—15 to 30 grains per diem (**1·0 to 2·0 Gm.**).

A brownish powder containing 6% of bromine; used as a nervine sedative.

Bromalin.—*Syn.* BROMETHYLFORMINE, HEXAMETHYLENTETRAMINBROMETHYLATE. $(CH_2)_6N_4.C_2H_5Br$ =247·39 (249·256 I. Wts.).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

In colourless scales or white crystalline powder, soluble 1 in 0·6 of water, and about 1 in 25 of alcohol 90%. Used as a nerve sedative, and especially in epilepsy, in doses double those of potassium bromide, with the same success but without skin eruptions or fetor. —B.M.J.E. i./95,24; P.J. i./95, 912,990,1115.

Brominoleum, Brominol (33%).—*Syn.* BROMIPIN.

Dose.—10 to 60 grains (0·65 to 4·0 Gm.) approximately equivalent in content of Bromine to 5 to 30 grains Potassium Bromide.

An additive compound of Bromine with Sesame Oil* (*v.p.* xxvii.) containing 33⅓% of the halogen in form of a thick yellow odorless oil, Sp. Gr. 1·0125. Is recommended as being more completely assimilated than the Alkaline Bromides, being absorbed by the intestine when acted on by the pancreatic secretion and bile, as causing no rash, none of the depression which sometimes results from Bromides, and being effective in attacks of epilepsy. It can be given by rectal injection or rubbed into the skin.

It is used as a substitute for the alkaline bromides in epilepsy and all forms of nerve troubles where the bromides would be employed.

Brominol may be given shaken up with an equal volume of syrup, in beer, wine or milk, or emulsified as follows: Brominol 33⅓% 2 ounces, Gum Acacia 1 ounce, Chloroform 18 drops, rub together and add quickly with vigorous agitation water *q.s.* to 6 ounces. *Dose.*—2 drachms equal 20 grains Potassium Bromide. A weaker **Brominol** containing 10% of Bromine is also

* In view of a probable Imperial Pharmacopœia in the future, it has been suggested that this oil, or arachis oil, or purified cotton seed oil may supplant olive oil. It has recently been employed for making ophthalmic solutions of alkaloidal bases. For this purpose it should be washed with half its volume of strong alcohol to free from fatty acids. The oil is separated and filtered if necessary. It is then sterilised at 120°C. for half an hour. Olive and castor oils are also used. —M.P. Aug. 1905. **Oleum Sesami** is official in **P. Austr.** with Saponification No. 187–193, Iodine No. 102–111. Three London commercial samples examined by us gave 86·24, 96·85, and 109·81.

prepared. A dose of ¼ ounce of this equals approximately 20 grains of Potassium Bromide.

Capsules contain 2 Gm. of 33⅓% Brominol in each equivalent to 15 grains Potassium Bromide.

Mistura Brominol cum Nuce Vomica. Brominol 30 grains, Gum Acacia 30 grains, Tincture of Nux Vomica 6 minims, Spirit of Chloroform 15 minims, water to half an ounce. For one average dose.

Brominol has been found to have special influence in epilepsy. The urine from patients under the Brominol treatment contains an appreciable quantity of Bromine in combination, and the fæces contain traces.

Bromocoll.

Dose.—8 grains (0·5 Gm.), increased to 130 grains (9.0 Gm.) for epileptics three times daily.

A Bromine-Tannin-Gelatin compound, containing 20% Bromine and 30% of Gelatin in the form of yellowish powder. May be administered in cachets. Is said to be a useful substitute for Alkaline Bromides in the treatment of epilepsy, insomnia, melancholia and nervous headaches, vomiting of pregnancy, also as a dusting powder for wounds. It is claimed that this compound, being almost insoluble in dilute acids, passes undecomposed through the stomach and will not be absorbed until it reaches the intestines. It is stated to produce no constipation ; acne, however, appeared in one patient. For epilepsy.—L. i./03,245.

Bromocoll Resorbin 20%. The above in the form of this ointment is advocated in urticaria, eczema, itching piles and various irritations of the skin.—B.M.J.E. ii./02,24.

Bromoform, P.G. iv., U.S.

$CHBr_3$=250·96 (252·888 I. Wts.).

Dose.—½ to 2 minims (0·03 to 0·12 Cc.) or more. P.G. maximum single dose 0·5 Gm. ; maximum daily dose 1½ Gm. Children may receive as many drops as years old—up to 6.

A limpid, colourless, sweet liquid, with an agreeable odour ; Sp. Gr. 2·829 to 2·833, B.Pt. 148° C. Soluble in alcohol 90% in all proportions, and ether, slightly so in water. Is decomposed by light. Is a powerful sedative, useful in insane cases.

Capsules contain ½ minim (0·03 Cc.) dissolved in oil.

Aqua Bromoformi. Well shaken, 1 minim is dissolved in 2 ounces of water. *Dose.*—1 to 4 ounces.

Mistura Bromoformi. *Dose.*—2 to 4 drachms.

Bromoform ½ (fluid) drachm, tincture of senega ½ ounce, shake well and gradually add water *q.s.* to 6 ounces, syrup of orange ½ ounce. Makes a good emulsion.

Bromoform in whooping-cough is harmless, diminishes number, duration, and severity of attacks, and mucous secretion is more easily got rid of.

Poisonous effects may however arise.—L. ii./98,1816; i./99,119; B.M.J. i /01,1202.

Rami Syrup. *Dose.*—1 teaspoonful to 6 tablespoonfuls, according to age. A French specialty for cough, containing bromoform, tolu, aconite, and codeine.

Brometone. TRI-BROM-TERTIARY BUTYL ALCOHOL. $C_4H_7OBr_3$=308·57 (310·936 I. Wts.).

Dose.—5 grains (0·32 Gm.). Large doses may produce dizziness, loss of appetite, and mental heaviness.—H. White crystals melting at 167°C. containing about 77% bromine. ***Soluble*** in alcohol, slightly in cold water.

Uses.—Hypnotic, analgesic, antiseptic. Useful in sea-sickness as a substitute for bromides.

Capsules of Brometone are supplied.

BUCHU. (*Off.*).

The dried leaves of *Barosma betulina* (*Rutaceæ*) contain volatile oil and mucilage. Carminative and diuretic. Buchu has antiseptic action in irritability of bladder and for gonorrhœa. The **infusion** (1 in 20 boiling water) is representative of the activity of the drug. *Dose.*—1 to 2 ounces.

Tincture 1 in alcohol 60% 5. *Dose.*—½ to 1 drachm.

Fluidextractum Buchu, U.S.

Average dose.—30 minims. 1 = 1 hydro-alcoholic percolate.

Diosmol, an ether-alcohol extractive of the leaves. *Dose.*—2 grains.

BUTYL-CHLORAL HYDRAS. (*Off.*).

Syn. CROTON-CHLORAL HYDRATE (formerly so called), TRICHLOR-BUTYLIDENE GLYCOL.

$CH_3.CHCl.CCl_2.CH(OH)_2$=191·97 (193·406 I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.), in pills or cachets.

Antidotes.—Stomach tube, emetic, coffee, caffeine atropine.

This body is produced by the addition of water to liquid Butyl Chloral which is the final product of the action of Chlorine on Aldehyde.

In pearly-white crystalline scales, having a pungent odour resembling that of Chloral Hydrate, and an acrid, nauseous taste. ***Soluble*** 1 in 43 of cold water; freely in alcohol, 1 in 1 of glycerin, and olive oil 1 in 20.

The most efficacious remedy in facial neuralgia. It does not depress the heart so much as chloral.—Dixon.

Menthol 2, with Butyl-Chloral Hydrate 1 part, liquefy. *v.p.* 474. Combines with Antipyrine, *v.p.* 262.

May be administered in mixtures with syrup or as

Mistura Butyl-Chloral, T.H.

Butyl-Chloral Hydrate 4 grains, Glycerin 15 minims, Water to 1 ounce. This is useful as an anodyne in neuralgic affections of the throat, frequently repeated.

Pilula Butyl-Chloral.

Butyl-Chloral Hydrate 3 grains (0·2 Gm.) or more, Glycerin of Tragacanth or Mucilage of Acacia *q.s.* To make one pill. *Dose.*—1 every 2 hours, or hourly.

Pilula Butyl-Chloral cum Gelseminina.—

NEURALGIC PILLS.

Gelseminine Hydrochloride $\frac{1}{200}$ grain (0·00032 Gm.) is added to each of the above. **Tablets** of the same formula are also prepared.

These are often very beneficial in facial neuralgia—two to be taken at the outset followed by one hourly until six have been taken.

Syrupus Butyl-Chloral, B.P.C.

Butyl-Chloral Hydrate 16 grains, Syrup 1 ounce. Dissolve the hydrate in the syrup made hot.

Dose.—One to four drachms (3·5 to 15 Cc.).

Most useful in true migraine, given with antipyrine, cannabis, or gelsemium; neuralgia of other nerves than the cranial rarely benefited.—Pr. xlvi.296; M.C., May 1891,140.

Chloretone; Trichlor-Tertiary-Butyl-Alcohol.

$CCl_3.(CH_3)_2C.OH$ = 176·09 (177·406 I. Wts.).

Dose.—5 to 24 grains (0·3 to 1·5 Gm.) in cachet, capsule, or tablet followed by a draught of water or milk, or suspended in a mixture.

White crystals, with camphoraceous taste, ***soluble*** 1 in 200 of water, 1 in 10 of glycerin, 3 in 2 of alcohol 90%, 1 in 50 of Aseptic Liquid Paraffin, 1 in 12 of Olive Oil and Oleic Acid. Is a hypnotic, local anæsthetic and an antiseptic.—L. i./00,106; P.J. i./00, 264; i./01,521.

Chloretone suggested as a douche 0·4% in warm water for vaginal pruritus.

For piles, 5 grains in a 30 grain suppository; for a dusting powder for wounds and scalds use Chloretone 23. with Zinc Oxide 120, and French Chalk 90 parts.

Capsules 5 grains check sea sickness.—L. ii./03, 136; i./04,253.

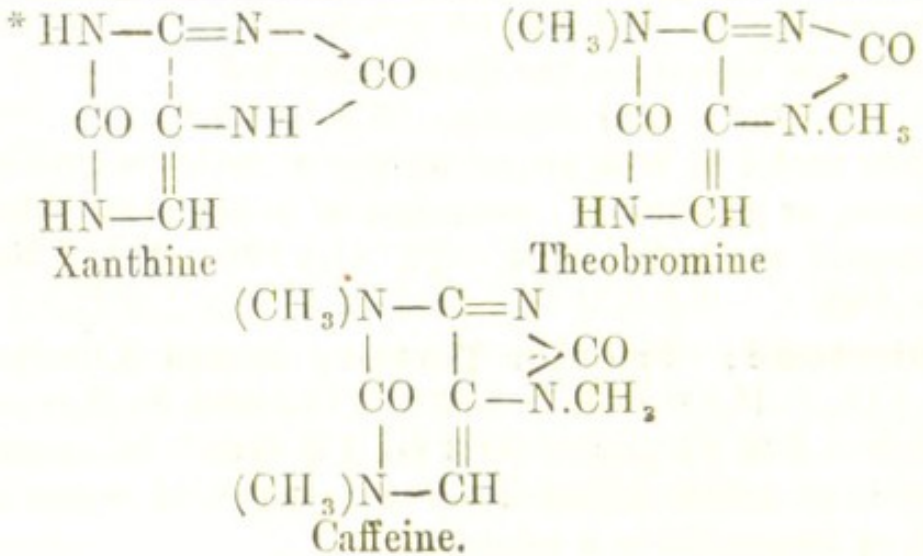
Dentalone is chloretone dissolved in essential oils. Dental analgesic and antiseptic.

CAFFEINA.

Caffeine (*Off.*), **Ph. Ned.** *Syn.* THEINE, GUARANINE. $C_8H_{10}N_4O_2,H_2O$=210·68 (210·64 U.S.) (212·256 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) or more —as much as 18 grains being recommended—given in solution, or in pills with glycerin of tragacanth.

A crystalline alkaloid (subliming at 178° C., M. Pt. 236·8° C., U.S.) usually obtained from the dried leaves of *Camellia Thea*, or dried coffee-seeds—*Coffea arabica*; also contained in Guarana (*q.v.*) and in Maté—the leaves of *Ilex paraguayensis*—also kola nuts—the seeds of *Cola acuminata*, growing in Western Africa; it is identical with Theine and Guaranine. Caffeine and Theobromine (*v.p.* 692) can be prepared from Xanthine* (the latter



being di- and Caffeine tri-methyl-xanthine) and indirectly from guano, as Xanthine may be obtained as a derivative of Guanine contained in guano. ***Soluble*** 1 in 80 of water, more so in alcohol, less in ether; acids render it more soluble in water, but it is a feeble base, and on concentrating the solution of the salts they are apt to split up, and the caffeine crystallises out by itself. Is rendered soluble in less water by the addition of an equal quantity of Antipyrin. Caffeine and Morphine fail to precipitate with Mayer's Reagent thus distinguishing them from the majority of alkaloids. It has a bitter, not agreeable taste. Tea contains on an average 4 to 4½% of Caffeine; raw coffee about 1·2%, and when roasted about 1·3%. For manufacture, tea dust with the strongest yield of alkaloid is extracted.

Uses.—It stimulates the heart and raises arterial tension. It is given for hemicrania. Locally, to the eye, it dilates the pupil. Caffeine and its allies are much used as diuretics; they act as direct stimulants to the water-secreting apparatus of the kidneys. They are Purin derivatives, *v.p.* 850.

Caffeol.—The empyreumatic oil in coffee has no particular physiological effects, excepting that it may be responsible for the dyspepsia produced by excessive use of coffee. "One-half to 1 teaspoonful" of it is contained in a breakfast-cup of coffee.—H. (!)

Pills of Caffeine contain 3 grains.

Useful in cardiac disease, especially where dropsy is a marked symptom. Is apt to induce insomnia. Large doses are required. It is better borne than digitalis.

A stomachic tonic, lessens tissue change, and waste, given in cases of diarrhœa, phthisis, and neuralgia.

Antidotes. — Stomach-pump and emetics. Poisoning by 60 grains of citrate caused burning in throat, giddiness, violent vomiting, purging and diuresis, tremors of extremities, pain in stomach and bowels, and great thirst. Recovery: treated with nitroglycerin, &c. —L. i./83,680. Poisoning by 200 grains; recovery under $\frac{1}{12}$ grain apomorphine.—L. i./89,219.

Caffeine useful in pneumonia as a cardiac stimulant pulse improves and temperature falls.—B.M.J. ii./88,43 Also in typhoid.—Pr. xli. 138.

Caffeine facilitates muscular labour by increasing activity of cerebro-spinal centres; diminishes sensation of effort and keeps off fatigue.—B.M.J. i./90,735,746.

Caffeine of great service in renal insufficiency, as injection with sodium benzoate.—Th. Gaz. 1890,436. Renal dropsy is diminished by caffeine.

Caffeine simultaneously with digitalis frequently gives favourable results not obtainable by increasing dose of digitalis.—B.M.J. ii./92,1156; L. ii./92,277.

Bronchial asthma of adults relieved by 5-grain doses of citrate; no ill effects except at times wakefulness, which is not unpleasant.—Pr. liv.318; P.J.1895,935.

Estimation of Caffeine in presence of Acetanilide, *e.g.*, in headache powders, extract from a sulphuric acid solution with chloroform. Precipitate with iodine and decompose the periodide with sodium sulphite, and extract the base again with chloroform.—C.D. ii./04, 469.

Vinum Caffeæ Viridis.

Dose.—1 to 2 ounces.

Coffee berries, green, coarsely ground, 16. Digest in sherry 40, for 14 days. Filter through flannel, press the residue, and make up to volume with sherry for any loss in evaporation; has been suggested for migraine.

Kola.—Seeds of *Cola acuminata, C. vera* (*Sterculiaceæ*).

Description of, and uses.—B.M.J. i./90,969; Ed.M.J. 1890,276; *v.p.* 188.

Extractum Kolæ Liquidum. B.P.C.

Dose.—10 to 20 minims. Kola nuts in 40 powder exhausted with 60% alcohol; 1=1.

Extractum Colæ Fluidum, P. Austr., is glycero-hydro-alcoholic containing 1% caffeine.

The administration of Kola, Coca and Arsenic flavoured with a little Elixir of Orange forms a useful tonic and pick-me-up.

Kolanin, a glucoside, is decomposed both by saliva and gastric juice; tonic and stimulant for neurasthenia and migraine. Under the name of Kolanin also specialties consisting of inspissated extracts are prepared, the latter said to contain 80 to 90% of Kolanin. *Dose.*—2 to 5 grains.

Tinctura Kolæ.

Dose.—20 to 60 minims (1·2 to 3·5 Cc.).

Kola nuts in powder 1 part, macerate one week in 60% alcohol *q.s.* to 6 parts.

Vinum Kolæ.

Kola in coarse powder 1, in Sherry 25, macerate for 7 days, filter and flavour with Essence of Vanilla.

Celerina is said to contain Kola, Coca, Celery and Viburnum.

Elixir Caffeinæ, U.S.N.F. Each drachm contains 1 grain of Caffeine. Rub Caffeine 17·5 with dilute Hydrobromic Acid 4, and about 125 of Aromatic Elixir until dissolved. Then add Syrup of Coffee 250 and finally Aromatic Elixir to 1,000.

Syrupus Coffeæ, U.S.N.F. Pour boiling water 500 on coffee, roasted and ground small 250; cover well and boil for five minutes. Cool, strain and make up to volume 500. Dissolve sugar 750 without heat and strain through muslin.

Maté, *Ilex paraguayensis* (*Ilicaceæ*) or Paraguay tea, contains one-fourth as much caffeine as tea, and is less astringent.—B.M.J. ii./90,203. Removes fatigue and induces sleep.—L. i./99,896,1392. As a drink, recommended.—B.M.J. i./04,401.

Caffeinæ Citras. $C_8H_{10}N_4O_2.C_3H_4(OH)(COOH)_3$ =383·42 (386·304 I. Wts.) (*Off.*). CAFFEINA CITRATA, U.S. (No formula.)

Dose.—2 to 10 grains (0·13 to 0·65 Gm.).

Is directed to be prepared by dissolving caffeine 1 and citric acid 1 in distilled water 2, evaporating to dryness on a water bath, stirring constantly towards the end of the operation, and reducing to a fine powder.

The use of water is unnecessary.—P.J.i./04,8.

Soluble.—1 in 32 water, 1 in 25 alcohol (90%).

The alkaloid is loosely combined with the acid, which latter may be volumetrically determined with standard Alkali, using Phenolphthalein as indicator.—Ph.

Incompatible with Potassium Iodide and Spiritus Ætheris Nitrosi, iodine being liberated.—B. & C.D. i./05,103. But the following does not darken:—Potassium Iodide 5 grains, Caffeine base 2½ grains, Spiritus Ætheris Nitrosi (neutralised with Ammonium Carbonate) 30 minims, water to 1 ounce.

In tricuspid incompetency with Sodium Benzoate.—M.P. ii./04, 515.

Caffeinæ Citras Effervescens (*Off.*). Caffeina Citrata Effervescens, U.S 4% Citrated Caffeine (was 2% in 1890). Contains 4% of the Citrate, or about 2½ grains in a drachm. *Dose.*—1 to 2 drachms (4 to 8 Gm.).

'Vescettes' of Caffeine Citrate.

Each equivalent to 60 grains of the above, and containing about 2½ grains of caffeine citrate.

Effervescent Caffeine (*Base*), 3 grains in 1 drachm. *Dose.*—1 to 2 drachms. (4 to 8 Gm.)

This, though somewhat bitter, forms a palatable mode of administering a moderately large dose of caffeine. The preparation is said to be invaluable for migraine.

Vescettes' of Caffeine (*Base*), contain 3 grains.

To be crushed and taken in water, preferably warm, during effervescence.

Effervescent Caffeine Citrate, with Potassium Bromide, has in addition 5 grains of the latter salt to the drachm. For headache.

Tabellæ Caffeinæ Citratis contain 1 grain.

These are of chocolate basis, are portable and agreeable to the taste.

Tablets Compressed, 2 grains (0·13 Gm.).

Tablets, Compressed of Caffeine 1 grain (0.065 Gm.), and Phenazone 3 grains (0·2 Gm.).

Tablets, Compressed, Caffeine 1 grain with Phenacetin 4 grains. *Dose.*—1 to 5.

Caffeinæ Ammonio-Citras. *Dose.*—1 to 10 grains (0·065 to 0·65 Gm.). A minutely crystalline white powder, slightly soluble in water.

Caffeine Hydrobromide, $C_8H_{10}N_4O_2$, HBr, $2H_2O$ = 308·91 (311·24 I. Wts.). ***Soluble*** 1 in 50 approx. **Hydrochloride** $C_8H_{10}N_4O_2$,HCl,$2H_2O$ = 264·75 (266·73 I. Wts.), and **Hydriodide** (unstable in composition).

Dose.—½ to 5 grains (0·032 to 0·32 Gm.) or more.

In transparent crystals, slightly soluble in water.

Tablets contain 2 grains each of the hydrobromide.

Effervescent Caffeine Hydrobromide is prepared containing 4%, or about 2½ grains, in a drachm.

Dose.—1 to 2 drachms (4 to 8 Gm.).

Caffeinæ Sodio-Salicylas (Coffeïno-Natrium-salicylicum, P.G.iv.).

Dose.—1 to 4 grains (0·065 to 0·26 Gm.) hypodermically. Maximum dose 1 Gm. (P.G.)

A white amorphous powder, containing 62·5% of caffeine, and soluble 1 in 2 of water. This salt and the corresponding cinnamate and benzoate act like digitalis, but more rapidly; the benzoate, **Coffeïnum Natrio-Benzoicum**, included in P. Austr., contains at least 40% caffeine. Is soluble about 1 in 2 of water.

Caffeine is very soluble in aqueous solutions of benzoate, cinnamate, and salicylate of sodium. These dissolve it in chemically equivalent quantities. The following solution with sodium salicylate forms an unirritating hypodermic injection.

Injectio Caffeinæ Hypodermica.

Caffeine 20 grains, Sodium Salicylate 17½ grains, Distilled Water to 1 drachm. *Dose.*—1 to 6 minims, contains 1 grain in 3 minims. Particularly recommended for alcoholic and morphine intoxication, also for hemicrania. Recently recommended in rheumatism, pains disappear.—M.A. 1906,428.

The addition of camphor as preservative for this injection is suggested. Thus to 3 Cc. of pure sterile glycerin add a solution of caffeine and sodium salicylate of each 0·25 Gm. in water 1 Cc.; then add spirit of camphor (10%) 1 Gm. or 1·25 Cc.; 5 Cc. of the product contain caffeine 0·25 Gm. and camphor 0·1 Gm.—C.D. i./06, 163.

Hypodermic Tablets contain Caffeine Sodio-Salicylate ½ grain (0·032 Gm.).

Caffeinæ Tri-bromidum, Caffeine Di-bromo-hydrobromide. $C_8H_{10}N_4O_2\,HBr,\,Br_2 = 431·85$ (435·128 I. Wts.).

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.).

In orange crystals, containing about 40% of Bromine in loose combination; to be given in capsule where combined Bromine and Caffeine treatment required.

Caffeinæ Tri-iodidum, Caffeine Di-iodo-hydriodide. $C_8H_{10}N_4O_2HI,\,I_2 + 1\frac{1}{2}\,H_2O = 598·32$ (603·182 I. Wts.). *Dose.*—2 to 4 grains (0·13 to 0·26 Gm.).

In prismatic black iridescent crystals, rich in iodine.

Has been used with success in rheumatism and gout.

Eupnine. *Dose.* — 1 to 4 drachms before meals A French specialty containing caffeine and iodine in coffee infusion. Employed in asthma, emphysema, and arterio-sclerosis.

Caffeinæ Valerianas. *Dose.*—½ to 3 grains (0·032 to 0·2 Gm.) In irregular crystals or powder, having the odour of valerian and of somewhat variable constitution. It controls hysterical symptoms, and is useful in pertussis.

Caffeine-Chloral.

A compound of caffeine and chloral, in small white granular crystals, freely soluble in water, with the acrid taste of chloral. Is analgesic and laxative, and in hypodermic injections of 3 to 8 grains useful in constipation, painful gastric distension, sciatica, and rheumatism.

Iodo-Caffeine.—*Syn.* SODIUM-CAFFEINE IODIDE.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.).

A white powder, slightly soluble in cold, freely in water at 100° F. Contains 65 % of caffeine. Is a good diuretic, especially to prolong diastole in cases of enfeebled heart. Is useful in cardiac dropsy, and pleurisy with effusion. Does not disorder digestion or respiration.—B.M.J. ii./94,1190.

Migranin.—*Syn.* ANTIPYRIN COFFEINO-CITRICUM, P. Austr. (Is said to be a definite chemical compound.) *Dose.*—8 to 15 grains (0·52 to 1 Gm.).

Contains 9 % of caffeine, 1 % citric acid, and 90 of antipyrine; is of crystalline appearance, easily soluble in water, with a slightly acid reaction, and, as its fancy name implies, is recommended as a specific for migraine and the headache of influenza, and that caused by nicotine and morphine. Is serviceable in headache, but apt to cause sleeplessness.

CALCIUM.

Ca = 39·71 (40·1 I. Wts.).

Calcium Metal has recently been produced electrolytically.—Na. Dec. 22, 1904, *p.* 80.

The method consists in electrolysing fused calcium chloride with an iron cathode which only just touches

the surface of the salt and can be moved outwards so as to produce ingots of the metal. Its density is 1·548, M.P. 810°C. Can be drawn out into a very fine wire, being tenacious. Is only slightly acted upon by water, but combines with hydrogen and with nitrogen.

For Chemical Uses, *see* P.J. i./05,721.

Calcium Carbide. $CaC_2 = 63·53$ (64·1 I. Wts.)
(Requires special storing.)

In solid, blackish crystalline masses, resembling small pieces of coal. Evolves acetylene gas when brought into contact with moisture or water. May be used as a test for, and in the preparation of, absolute alcohol.—P.J. i./98,139.

Carcinoma of the uterus, piece of carbide applied with success to dried ulcerated surface with a tampon over it, checks bleeding, fetor and discharge.—Münch. Med. Woch., 1900, No. 24.

Calcium carbide is made to combine with nitrogen obtained from the air by fractional distillation of liquid air. Calcium cyanamide formed can be utilised as manure and for other purposes.—B. & C.D. i./06,1444.

Calcii Chloridum. (*Off.*) $CaCl_2.2H_2O = 145·85$ (147·032 I.Wts.) ($CaCl_2$ U.S. = 110·16 U.S. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.) in aqueous solution, or it is more palatable made into pills with syrup; these must be kept in bottles.

In fused white agglutinated, very deliquescent masses.

Incompatible with carbonates, phosphates, sulphates and tartrates.

Uses.—In tubercular disease, chorea, glandular affections, to stop the growth of uterine fibroids, and to check the vomiting due to sarcinæ. It is not astringent.

To check profuse menstruation it has been found well to give doses of 10 to 15 grains daily for a week before the period; but its use should be avoided if there be kidney disease.

To check intestinal hæmorrhages 30 grains daily may be given internally, and accompanied by rectal injections containing 60 grains to two pints of water; opium may be given in addition. In typhoid deserving of trial 10 grain doses.—B.M.J. ii./04,1453. Calcium chloride increases the coagulability of the blood, and so to act as a

hæmostatic (Sir A. E. Wright).—B.M.J. ii./91,1306; L. ii./05,1096. Coagulability of the blood is—

Increased by—	Diminished by—
Carbonic Acid,	Oxygen,
Calcium Chloride or Lactate,	Alcohol,
Milk,	Restriction of Food,
Magnesium Carbonate.	Diminution of Lime Salts,
	Large quantities of Fluid,
	Citric Acid,
	Rhubarb,
	Acid Fruit Juices,
L. i./06,645,739.	Acid Wines,
	Tobacco Smoking.

For hæmoptysis give a rectal injection (high up) of 30 grains, with morphine hypodermically and ice to the affected part of the chest.—B.M.J. ii./04,1635.

Mayo Robson gives this drug to obviate hæmorrhage at operations on the bile ducts, 30 grain doses by the mouth, and after operation in 60 grain doses three times a day by the rectum.—L. i./02,1024; ii./03,358.

Ten grains three times a day for two weeks before delivery to avoid post partum hæmorrhage.—Med. Ann. 1902,305.

Intra-dental fissure, bleeding from, successfully treated by pledgets of cotton wool soaked in solution 30 grains to the ounce after other hæmostatics had failed.—L. i./03,516; B.M.J. i./02, 1141.

Bleeding piles treated by injection every morning of 4 to 6 drachms of a 10% solution.—C.D. ii./05,1052.

Liquid Extract of Liquorice or peppermint water and syrup disguise the taste—1 hour after a meal is the best time for the dose.—L. ii./03 358.

Acute lobar pneumonia, 22 cases treated successfully with chloride of calcium, 5 to 15 grains every 4 hours.—Pr. l. 263. Corroborated.—B.M.J. ii./93,1374.

Large doses useful in checking bleeding from large vessels.—Clin. Jour. v. 345.

Of service to check and prevent the bleeding of patients with hæmophilia, as after tooth extraction.—L. ii./97, 1061; i./03, 516.

Epistaxis successfully treated, 10 grain doses thrice daily.—B.M.J. i./06,198.

Gastro-intestinal bleeding of children checked by five grain doses many times daily.—L. ii./98,144.

On the action of lime salts on the blood.—L. ii./02 15.

In chilblains very serviceable. 15 to 20 grains every 2 hours, for 3 doses only.—B.M.J. i/06,1020.

Calcium salts effectually relieve headaches (and remove chilblains) due to deficient coagulability of the blood. Experiments showed that on giving Potassium Citrate headache and chilblains returned.—L. i./06,143.

For foul ulcers and chilblains excellent.—B.M.J. ii./05,138.

Liquor Calcii Chloridi, B.P. 1885, was 1 to 5 of distilled water. *Dose*, 15 to 50 minims (0·9 to 3 Cc.).

Elixir Calcii Chloridi. *Dose.*—1 to 2 drachms.

Calcium chloride 60 grains, Orange Syrup ½ ounce and Syrup of Tolu ½ ounce.

Calcium chloride requires a strong flavouring to cover its acrid taste.

Calcii Peroxidum. $CaO_2 = 71{\cdot}47$ (72·1 I. Wts.).

Syn. GORIT.

Dose.—3 to 9 grains (0·2 to 0·6 Gm.) daily.

A useful intestinal antiseptic for infants. Best results in cases of acid dyspepsia.—P.J. i./00,330. It explodes if mixed with Glycerin or Formalin.

Under the name "**Calox**" is contained in a dentifrice.

Calcii Phosphas (*Off.*), **U.S.** $Ca_3(PO_4)_2 = 307{\cdot}77$ (307·98 U.S. Wts.), (310·3 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1·0 Gm.).

White powder made by precipitation of calcium chloride (from bone ash) with ammonia, or by interaction of sodium phosphate and calcium chloride. Insoluble in water; soluble in dilute hydrochloric and nitric acids. Is a constituent in Pulvis Antimonialis (*Off.*)

Uses.—To supply lime to growing bones and to assist in general nutrition. Is also given to pregnant women for the same purpose. Is an ingredient in Chemical Food, Syrupus Ferri Phosphatis Compositus, *q.v.*

Calcii Chlorhydrophosphorici Sirupus, P. Belg.

Calcium Phosphate 15·5, Hydrochloric Acid about 8 or *q.s.*, Sugar 630, Spirit Limonis (Oleum Limonis 1, Alcohol 80% 99) 7, Water 340. *Dose.*—10 to 30 Cc.

Calcii Chlorhydrophosphoricum Solutum, P. Belg.

Calcium Phosphate 25, Hydrochloric Acid 15, Water to 1,000.

Calcii Saccharas.

Dose.—8 to 30 grains (0·52 to 2 Gm.).

In colourless tufts, soluble in water, used as an antacid for dyspepsia and flatulence, specially useful for

children; also as an antidote to carbolic acid poisoning in 10 times above doses.

Calcium Monosaccharate is $C_{12}H_{22}O_{11}CaO$= 395·19 (398·276 I. Wts.), and the **Bisaccharate** $C_{12}H_{22}O_{11}2CaO$=450·78 (454·376 I. Wts.), but the article in commerce is mostly the trisaccharate.

The **Trisaccharate** $C_{12}H_{22}O_{11}3CaO, 3H_2O$ = 560·01 (564·524 I. Wts.), is generated when mono- and bi-calcium saccharate solutions are boiled. — *Vide* Lippmann, "Chemie des Zuckers," 1895, *p.* 765.

Liquor Calcis Saccharatus. (*Off.*)

Dose.—20 to 60 minims (1·2 to 3·5 Cc.).

Calcium Hydroxide (free from iron, preferably prepared from marble) 1, Distilled Water 19. Mix, and add Syrup (by weight) 3 (=Refined Sugar 2). Contains 1·77 per cent. of Calcium Oxide, or 8·16 grains in 1 ounce.

Calcii Hydras. (*Off.*) $Ca(OH)_2$=73·47 (74·116 I. Wts.). Should be recently made by action of water on calcium oxide. Is employed in preparation of liquid extract of ipecacuanha. Has slight caustic action.

Is more soluble in cold water than in hot.

Liquor Calcis (*Off.*) is given to infants with milk.

Linimentum Calcis (*Off.*).

Solution of Lime 1, Olive Oil 1; or with Linseed Oil 1, is known as **Carron Oil**—St. Bart.'s H.; Mid. H.

Eucalyptus Oil 5% is often added as antiseptic.

Mistura Cretæ, Chalk Mixture (*Off.*).

Dose.—½ to 1 ounce (15 to 30 Cc.).

Prepared Chalk 50, Tragacanth 7, Sugar 100, Cinnamon Water *q.s.* to 1,600.

The powders are generally kept mixed in a dry condition, and 40 grains of this may be added to an ounce of cinnamon water as required.

Calcii Sulphas. $CaSO_4,2H_2O$=170·81 (172·192 I. Wts.). *Syn.* CALCIUM SULPHATE.

Dose.—20 to 30 grains daily (1·3 to 2·0 Gm.).

A heavy white powder soluble in water 1 in 390.

For phosphaturia is considered as specific; it may be well given with an equal weight of Heavy Magnesium Carbonate.

Dried Calcium Sulphate, $2CaSO_4,H_2O$= 287·98 (290·336 I. Wts.), so long as it remains dry,

is used to make Plaster of Paris splints. Two pounds require about one pint of water; this sets rapidly and firmly. U.S. has a powder containing a out 95% $CaSO_4$ (=135·15) and about 5% water.

Plaster of Paris Bandages, 2, 2½ and 3 inches wide (6 yards). In sealed tins.

Crinoline Bandages are prepared for above and for silicating, *see p.* 663.

Calx Chlorinata (*Off.*). A dull white powder having 33% (30% U.S.) available Chlorine. Solutions of 0·25 to 0·5% are applied to burns and ulcers—they heal rapidly. **Calcium Hypochlorosum. P. Austr.** orders 25% Chlorine. Is employed to bleach teeth by packing into cavities with acetic acid.

Calx Sulphurata (*Off.*), U.S. *Syn.* CALCII SULPHIDUM; CANTON'S PHOSPHORUS. Contains not much less than 50% CaS=71·53 (72.16 I.Wts.) (at least 60% U.S.) CALCIUM OXYSULFURATUM, **P. Austr.**

Some forms of it after being heated shine in the dark and are used to make luminous paint.

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.) in pill.

Is prepared by reducing Calcium Sulphate by charcoal. It has a greyish white colour and slight sulphuretted odour; it is but sparingly soluble in water, which solution quickly decomposes, evolving sulphuretted hydrogen. It thus represents the properties of Harrogate, Barèges, Gilsland, and similar springs. Largely used for boils, carbuncles, acne, scrofulous sores, especially in glands of the neck, and has been used to modify the pustulation of small-pox and so prevent pitting.

Pilula Calcis Sulphuratæ, $\frac{1}{12}$, $\frac{1}{10}$, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, and 1 grain (U.C.H. ½ grain).

Triturate with milk sugar, adding acacia and syrup *q.s.*, coat with sandarach solution. Keep in bottles.

Tablets contain ¼, ½ and 1 grain.

In strumous ophthalmia, as well as in periostitis and alveolar abscesses has been found of service.

Usual dose is too small for boils; give 1 grain three times a day, increased to 8 grains daily.—L. i./85,64.

Lotio Calcii Sulphurati, U.C.H.

Slaked Lime 4, Sublimed Sulphur 4, Distilled Water 35. Boil together, evaporate, and filter, to produce 20 of solution. This should be diluted with an equal quantity

of warm water for painting over the patient, who ought previously to have had a bath, as a remedy for itch, which it will cure in half an hour. It resembles in composition **Vleminckx' Solution**

Sulphurated Lime Depilatory.

Is a thick milk of lime charged with sulphuretted hydrogen.—P.J. ii./00,486.

Syrupus Sulphatum (H. P. Symonds).

Dose.—½ an ounce (15 Cc.) Beberine Sulphate 1 grain, Quinine Sulphate 2½ grains, Ferrous Sulphate 2½ grains, Potassium Sulphate 8 grains, Sodium Sulphate 8 grains, Diluted Sulphuric Acid 5 minims, Glycerin 12 minims, Distilled Water 48 minims; dissolve and add Syrup to ½ ounce. Filter. Add to each pint, Chloroform 10 minims, mixed with 20 minims of Spirit. Is useful for boils, &c. The sulphates give off some sulphuretted hydrogen, and the bases act as tonics.

Pilula Sulphatum.

The salts of half-an-ounce of the above syrup may be prescribed in two pills under this name.

CALENDULA, U.S.

The dried ligulate florets of *Calendula officinalis* (*Compositæ*) (Linné) (marigold). *Dose*, 15 grains (1 Gm.)

A lotion prepared from the tincture diluted, or an ointment prepared from tincture 1 part, and spermaceti or simple ointment 9 parts, is said to have a beneficial influence over wounds, especially incised wounds. It promotes cicatrization, with but little suppuration.

One minim of tincture with boric acid 2 to 4 grains is a useful insufflation in otorrhœa.—Pr. xxx.366.

Tinctura Calendulæ Florum, B.P.C.

Marigold Flowers, in No. 20 powder 1, Alcohol (60%) *q.s.* to 5. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

Tinctura Calendulæ, U.S., is 1 in 5 of Alcohol 94·9%.

CAMPHORA (*Off.*) U.S., P. AUSTR.

$C_{10}H_{16}O$=150·98 (152·128 I. Wts.).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Camphor is a white crystalline substance obtained

from *Cinnamomum camphora* (*Lauraceæ*) in Formosa and Japan. It is sold in bells, and in ¼, ⅓, ½, 1 and 4 ounce cubes, also as **Flowers of Camphor.** The latter is a very convenient form for making pharmaceutical preparations.*

The manufacture of artificial camphor has been effected by acting on Turpentine with Anhydrous Oxalic Acid with special means and apparatus, the yield being 25 to 30% of the turpentine.—P.J.i./04,9.

It may also be prepared by oxidising Camphene, a solid terpene $C_{10}H_{16}$ with Chromic Acid Mixture.—Ph.

Uses.—Sedative, anti-spasmodic, carminative, expectorant, diaphoretic, anaphrodisiac, antiseptic, given internally to abort colds in the head, to relieve hiccough, diarrhœa, chordee, and lumbago.

Meningitis caused by camphor liniment treated successfully by caffeine injection.—L. ii./05 1472; P.J. ii./05, 723. Cases of Camphor habit.—B.M.J. ii./98,84.

Whooping Cough treated by camphor.—Med. Rec. July 22, 1905.

Soluble in water, 1 in 700, in alcohol 90% 1 in 1¼ (more soluble in absolute alcohol), in ether 12 in 7 barely, chloroform 4 in 1 scarcely, volatile and fixed oils (olive 1 in 3), in glacial acetic acid 2 in 1. Camphor, when mixed in certain proportions with many crystalline substances, causes mutual liquefaction of the two—*e.g.*, camphor 4, phenol 12, and water 1 (*see* Acidum Carbolicum); camphor 1, and chloral hydrate 1 (*see* Chloral Hydras); camphor 2 and menthol 3 (*see* Menthol); camphor 1 and thymol 1 (*see* Thymol); camphor 2 and β-naphthol 1 (*see* Naphthol); camphor 2 and salol 3 (*see* Salol); camphor and butyl-chloral hydrate liquefy when heated, but solidify on cooling; so will camphor 84 and salicylic acid 65 (*see* Camphora Phymol Salicylata). Camphor is powdered by rubbing with a few drops of alcohol. Besides the official preparations,

* Essential Oil of Camphor is of a pale straw-colour or darker, with fragrant odour, Sp. Gr. 0·898 to 0·990; consists principally of a terpene, with about 1 in 4, or less of camphor in solution, together with safrole and eugenol (*v.pp.*736,748). Used by the Chinese in rheumatism. Oil of Camphor, Sp. Gr. 0·96 to 1·02, is also obtained.

Camphor Water† (Camphor Julep or Mixture) 1 in 1,000, Liniment‡ 1 to 4 Olive Oil (U.S. orders same strength in camphor to be prepared with cotton seed oil,—Oleum Gossypii Seminis expressed from *Gossypium herbaceum* and other species—*Malvaceæ*), Ammoniated Liniment 1 in 8, Spirit 1 in 10 (and U.S.), and Compound Tincture 0·34%, the following are in use:—

Hope's Camphor Mixture.

Dose.—2 ounces every 3 or 4 hours.

Nitrous Acid 2, Tincture of Opium 1·3, Camphor Water 120. In cholera and diarrhœa.—H.

Aqua Camphoræ Concentrata.

Camphor 1, Alcohol (90%) 3. Dissolve, add Quillaia Tincture 1½, Water to 24. For dilution 1 drachm to 6 ounces. — B.M.J. i./06, 318 (danger, 480). This procedure is not the generally recognised method.—*cf.* Ph. Form., 554–557.

Aqua Sedativa. Eau Sedative de Raspail (*Codex*).

Spirit of Camphor 10, Sodium Chloride 60, Solution of Ammonia 60, Distilled Water, 1,000. That of P. Belg. is similar. Applied as a compress for migraine and rheumatism, and to contusions.

Camphor Ball.

Spermaceti 4, White Wax 12, Oil of Almonds 5; melt in a water bath, and add Flowers of Camphor 4. Dissolve, and when nearly cold pour into boxes or mould in gallipots. Useful for chapped skin.

Camphorated Chalk.

Flowers of Camphor 1, Precipitated Calcium Carbonate 7. Mix in a mortar, adding a few drops of alcohol, and sift for use as a dentifrice.

Camphorated Carbolic Acid, *v.p.*17.

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† Aqua Camphoræ (*Off.*).—*Dose.*—½ to 2 ounces (15 to 60 Cc.). Camphor flowers 1, Alcohol (90%) *q.s.* to 3, Distilled Water to 1,000. Camphor is rendered more soluble in water by the presence of carbonic acid, acid carbonate and carbonate of magnesium, sugar, and myrrh, and less soluble by bromide of potassium, liquor potassæ, sulphate of magnesium, alkaline carbonates, and many other salts.—P.J. 1895,619.

‡ In preparing this, '*English-refined*' flowers should be rubbed through a sieve, and dropped into the oil at 70° to 80° F. Foreign flowers give muddy solution.

Ceratum Camphoræ, U.S.

Camphor Liniment (1 to 4 cotton seed oil) 10, White Wax 35, White Petrolatum 15, Benzoated Lard 40.

Elixir Camphoræ. *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.).

Spirit of Camphor 10, Syrup 5, Distilled Water 1. Contains 1 in 16. It mixes and diffuses well in water.

Oleum Camphoratum, P.G.iv 1 to 9 of Olive Oil and **Oleum Camphoratum Forte, P.G.iv.** =Linimentum Camphoræ (*Off.*), *v.p.* 202.

The B.P. might with advantage add tests for the oil after volatilising the camphor. *See* Oleum O ivæ.

Pilula Camphoræ.

The most suitable excipient to form camphor into pills is about ⅓ its weight of powdered curd soap and a few drops of proof spirit, or a little lard in a warm mortar.

Tablets, Camphor and Quinine. Contain Camphor ¼ grain, with Quinine Acid Sulphate 1 grain. To check catarrh, and as a general tonic.

Spiritus Camphoræ Fortior.

Syn. RUBINI'S SOLUTION OF CAMPHOR.

Flowers of Camphor 1, Absolute Alcohol (by weight) 1. *Dose* for diarrhœa.—2 to 5 drops on sugar every 5, 10, or 15 minutes, according to the severity of the symptoms.

Trochisci Camphoræ contain 2 grains in each.

Wool, absorbent, camphorated (33 %) 1 lb. rolls.

Camphoid, a substitute for Collodion.

A solution, 1 in 40, of pyroxylin, in equal parts by weight of camphor and absolute alcohol. May be used as a vehicle for the application to the skin of such drugs as iodoform, phenol, salicylic acid, resorcin, iodine, chrysarobin, and ichthyol. Iodoform dissolves in it to the extent of 1 in 10. The preparation dries in a few minutes, leaving an opaque film, which is not easily washed off.—P.J. 1892,831; B.M.J. i./92,1086.

Celluloid is supplied in sheets $\frac{1}{16}$ inch thick, and being light, rigid and washable, is useful in surgery for splinting; it is rendered plastic by rolling up and macerating in hot spirit for a few minutes; it may then be wrapped round the limb with a layer of wool outside and quickly sets. N.B.—Very inflammable.

Acidum Camphoricum, P.G.iv. U.S. Ph. Ned.
$C_8H_{14}(COOH)_2$=198·62 (200·128 I. Wts.).

Dose.—10 to 20 grains (0·65 to 1·3 Gm.) in cachets.

Formed on oxidation of camphor with nitric acid (test for free nitric acid with ferrous sulphate, U.S.) odourless crystals, M.Pt. 187° C. Dextrorotatory. U.S.

Soluble in water about 1 in 200, in alcohol 90% about 1 in $1\frac{1}{2}$, and in fatty oils about 1 in 10. Some is formed in "Sanitas."

Uses.—With success in night sweats of phthisis, also in cystitis by intravesical injections of 2% aqueous solution with 11% alcohol (M. '01, 28), and as an intestinal disinfectant. Further in solution as a local astringent for nose and throat, also for diarrhœa.—L. i./92,47; B.M.J. i./92,947; M.C. June'97,200.

Of little use in cases of bromidrosis.—H.

Camphora Monobromata, $C_{10}H_{15}BrO$ = 229·33 =231·08 I. Wts.), U.S., P. Jap.

Dose.—2 to 10 grains (0·12 to 0·65 Gm.) in pills, with $\frac{1}{3}$ of its weight of curd soap and proof spirit *q.s.*

In colourless prisms, soluble in ether, alcohol, and fixed oils, insoluble in water. It has a slight odour of camphor and a turpentine-like taste. It is used as a hypnotic; large doses produce clonic convulsions and muscular trembling.

Epileptic vertigo and cases of petit mal are certainly improved by it.—B.M.J.E. ii./99,24.

In delirium tremens 7-grain doses often repeated recommended, also in insomnia, chorea, and hysteria.

In whooping-cough of children, 5-grain doses serviceable, and useful in asthma.

Perles are prepared containing 2 grains (0·13 Gm.)

Tablets contain 1 grain (0·065 Gm.).

Elixir Camphoræ Monobromatæ.

Monobromated Camphor 1, Spirit of Cinnamon (1 in 10) 10; dissolve and add Red Elixir (*v.p.* 321) 60, Syrup *q.s.* to 100. *Dose*—½ an ounce (15 Cc.).

Combined with belladonna, useful in enuresis where potassium bromide is unsuitable.

Camphora Salicylata. *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.), in pill, with suet or lard.

Prepared by heating together carefully 84 parts of

camphor and 65 parts of salicylic acid, until a liquid homogeneous solution is formed, which becomes a crystalline mass on cooling. This again becomes unctuous when pounded, and liquefies when rubbed on the skin. It may be obtained in definite crystals from a benzol solution. It is slightly soluble in water and glycerin, about 1 in 20 of fats and oils, and is decomposed by hot alkaline solutions. By boiling with water it hydrates into an oily liquid. Applied as an ointment, it was found useful in lupus and rodent ulcers. May prove serviceable in some forms of diarrhœa and to form antiseptic dressings.

CANNABIS INDICA (*Off.*), U.S.

The dried flowering or fruiting tops of the female plant of *Cannabis sativa* (*Urticaceæ*), grown in India (not deprived of resin). A study of its pharmacology. —B.M.J. ii./99,1354. Work and notes on varieties, Gánjá or Guaza, the masses obtained in European commerce, and Bhang or Hashish consisting of the leaves, small stalks and fruits.—P.J. ii./02,129.

The therapeutic value of the drug is contained in the resin. It appears to contain no peculiar alkaloid. The constituent Cannabinol becomes oxidised on exposure to the air. For use in medicine it should be as fresh as possible.—P.J. i./02,363. It is a powerful drug.

Magum. An intoxicating sweetmeat. A Sanskrit or Tamil name used for a confection in which a preparation of cannabis sativa, nux vomica, poppy seeds and aromatics are ingredients.—C.D. i./05,492.

Extractum Cannabis Indicæ (*Off.*), U.S.

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.), in pill with lycopodium. Is an alcoholic extract, of which 1 dissolved in 20 of alcohol (90%), forms —

Tinctura Cannabis Indicæ (*Off.*). (U.S., 1 in 10 'alcohol' U.S.) *Dose.*—5 to 15 minims (0·3 to 0·9 Cc.), suspended in some mucilaginous fluid. **Tablets** equal 5 minims.

Tetanus after child birth, two cases cured by 15 minims of Tincture every 3 or 4 hours.—L. i./06,1608.

Copper and zinc have been found as impurities in commercial extracts.—P.J. ii./04,475.

Fluidextractum Cannabis, U.S. 1—1 alcoholic percolate. *Dose.*—1 minim (0·05 Cc.).

Pilula Extracti Cannabis Indicæ, contain $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ and 1 grain.

Haustus Cannabis Compositus. Vic. Park.

Dose.—1 ounce (30 Cc.).

Tincture of Cannabis, Tincture of Stramonium of each 10 minims, Potassium Iodide, Caffeine Citrate of each 5 gr., Water to one ounce.

For asthmatic attacks and dyspnœa.

N.B.—Recently the Cannabis imported had considerably more toxic effect than formerly (this—in spite of the fact that a high export duty is placed upon the drug). It has, indeed, been stated that toxic symptoms have been produced by doses of the Extract within the official limits.

Antidotes.—Stomach pump, emetics, stimulant draughts, artificial respiration, coffee.

No death from cannabis is on record.—H.

Uses.—For chordee and asthma, also as an aphrodisiac, and is successful in migraine. Is a narcotic and anodyne, but will in some persons produce peculiar dreams and even delirium.

It is useful in dysmenorrhœa, especially with Gelsemium; with Nux in incipient delirium tremens, nausea, and paroxysmal colic, supraorbital neuralgia, and cough of phthisis. Should be given in small and frequent doses.

It is *the* remedy for menorrhagia.—B.M.J. i./83, 1002.

For dull continuous headache, the extract is very useful, in doses of $\frac{1}{3}$ to $\frac{1}{2}$ grain.—B.M.J. i./87,97.

Migraine treated with $\frac{1}{4}$ grain pills.—La Presse Médicale, July 19,05; M.P. i./06,11.

Cannabis of great use in mental worry and restlessness, combined with strychnine, with chloral in chorea, and alone or with $\frac{1}{4}$ gr. zinc phosphide in migraine.—B.M.J. ii./91,12; Pr. xlvii.140,296.

For whooping-cough, 2 to 5 minims of tincture for children between 2 and 11 years of age, every three or four hours, will prove serviceable.

Cannabin Tannas, Cannabin Tannate.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.) taken an hour before bedtime, in a pill with glycerin of tragacanth or in solution of sal volatile and water.

A yellowish brown powder, prepared from *Cannabis Indica*. Tastes like tannin, has a not unpleasant smell, is insoluble in water, slightly soluble in alcohol, and dissolves easily in water made slightly alkaline. It does not produce intoxication, and is said to be a useful hypnotic, that rarely deranges the digestive and secretory organs, bowels, &c., and is specially valuable in nervous sleeplessness and in acute mania. Is valuable for dysmenorrhœa and menorrhagia.

Pilula Cannabin Tannatis, 2, 3 and 4 grains.

Cannabinon. *Dose.*—¼ to 1 grain (0·016 to 0·065 Gm.). A purified resin of treacle consistence.

For dispensing purposes, a dilution is made of 1 to 9 of milk sugar. 10 kilograms of cannabis extract yielded 2·2 kilograms of this resin.

Cannabinol. A yellow oil obtained from this resin by distillation. Soluble in alcohol, ether and chloroform; not supplied commercially.—L. ii./03,174.

CANTHARIS (*Off.*) U.S.

Syn. Lytta; Spanish or Blistering Fly.

Dose.—$\frac{1}{16}$ to ½ grain (0·004 to 0·032 Gm.) in pill. Better given as tincture.

Of this, the dried insect—*Cantharis vesicatoria*—there are the following preparations official:—Acetum, 1 in 10 (of 50% Acetic Acid); Emplastrum,* about 1 in 3; Tinctura, 1 in 80; Unguentum, 1 to 10 of Benzoated Lard; Liquor Epispasticus, 1 in 2 (*v.p.* 209); and Emplastrum Calefaciens, about 1 in 24 (as in B.P. 1885, but Oil of Nutmeg omitted).

For Tinctura Cantharidis, C.U.D. proposes 1 in 10 strength, prepared with Alcohol 70%—the strength in most foreign Pharmacopœias. The Cantharidin content could be standardised.—B.M.J. i./82,29.

Methods of determination—should contain Cantharidin not less than 0·4%.—Y.B.P.02,51.

Four samples of Russian and one of Spanish yielded 0·67 to 0·81% Cantharidin.—P.J. ii./04, 475.

Uses.—Externally vesicant, irritant and powerful counter-irritant. Used in pleurisy, pericarditis, neuritis, applied above the stomach to stop vomiting.

Internally is said to have aphrodisiac properties. Has been given in lupus and in chronic gout. Caution is necessary to avoid irritation of the kidneys.

*The powder should be *coarse*.—Naylor, B'ham Conf., July '06.

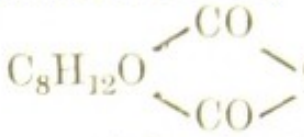
Hæmaturia is checked by five-minim doses of tincture of cantharides.—B.M.J. ii./98,1551. Useful in incontinence.—B.M.J. i./01,752.

Antidotes.—Emetics, stomach pump, white of egg (no fats); sedatives.

Both Cantharides (*Lytta vesicatoria*) and Mylabrides (*M. Cichorii* and *M. pustulata*) are official in **Pn. Ned.**

Mylabris phalerata and *sp.* are official in I.C. Add. for making external applications in India. *v.p.*xxvi. These contain about 1 to 2%, or more than double the amount that Cantharides do of the neutral principle—

Cantharidin,



$C_8H_{12}O_4$ = 194·62 (196·096 I. Wts.).

Lactone of Cantharidic Acid, in flat glistening rectangular prisms, which melt at 218° C., and volatilize in very irritating white fumes. ***Soluble*** 1 in 60 of chloroform, 1 in 38 of acetone, and about 1 in 150 of acetic ether. Soluble also in ether, benzene, glacial acetic acid, fats and oils, 1 in 1,000 of absolute alcohol; insoluble in water. ***Uses.***—Solutions of Cantharidin, as well as other preparations of cantharides, are employed for stimulating the growth of the hair, in alopecia, and preventing its falling off, as in the following preparation:—

Acetum Cantharidis (*Off.*) (*vide p.* 207). Might be replaced by a solution of Cantharidin 1 in 2,000 of a mixture of Glacial Acetic Acid 1 with Acetic Acid 19.—P.J. i./98,255.

Acetum Mylabridis (*M. Cichorii* and *M. pustulata*) **Ph. Ned.** Strength 1 in a mixture of Alcohol (90%) 1 and Acetic Acid (30%) 9.

Linimentum Crinale (Squire).

Cantharidin 1 grain, Acetic Ether 6 drachms; dissolve with a gentle heat, and add Alcohol 90 per cent. 6 ounces, Castor Oil 2 ounces, Oil of Lavender 15 minims.

It is better to dilute this with an equal quantity of spirit, and the head should be washed after applying it a few times, to prevent the cantharidin accumulating.

Anodyne Vesicant. Camphor 20, Chloral Hydrate 30, place in a bottle, liquefy by heat of water bath

and add Cantharides 10. Digest at 140° to 160° F. for one hour, and strain with pressure.

Charta Epispastica, B.P. 1885.

Paper spread with a composition of Spermaceti, Olive Oil, Resin, Canada Balsam, and Cantharides.

Tela Vesicatoria is a blistering tissue with properties similar to the above.

Collodium Vesicans (*Off.*).

Blistering Liquid 40, Pyroxylin 1.

Dissolve. It evaporates quickly, and its action is confined to the part on which it is painted. It is specially useful to apply to the temple or behind the ear, or other parts of the body where the following preparation would not locate itself.

Might be made the same strength with a solution of Cantharidin 1 in 300, *vide below*.—P.J. i./98,255.

Emplastrum Cantharidis (*Off.*).

Cantharides 7, Yellow Beeswax 4, Lard 4, Resin 4, Soap Plaster 1.

To the melted resin add the soap plaster, then the wax and lard, liquefy, and as the mixture cools, sprinkle in the cantharides.

Cantharidin 1 in 1,000 to replace.—P.J. i./98, 255.

Emplastrum Vesicans, U.C.H.

Cantharidin 1, Chloroform *q.s.*; heat to dissolve and add to Yellow Wax, and Wool Fat, in equal proportions, previously melted together, 499.

Linimentum Cantharidis Compositum, W.H., has Liquor Epispasticus 60, Glacial Acetic Acid 20, Rosemary Oil 3, Castor Oil 90, Alcohol 90 % to 480.

Liquor Epispasticus, Blistering Liquid (*Off.*).

Cantharides in powder 1, percolated with Acetic Ether *q.s.* to 2. This preparation and the Collodion are about double the strength of those in B.P. 1885.

Cantharidin 1 in 300 would be equivalent.—P.J. i./98,255. **Emplastrum Cantharidis Liquidum** has a similar use, to be painted on with a brush.

Tinctura Cantharidis (*Off.*) 1 in 80. U.S. 1 in 10 Alcohol (94·9 vol. %). *Dose*.—5 to 15 minims.

Might be replaced by a solution of Cantharidin 1 in 10,000 of Chloroform 1 in Alcohol 100.—P.J. i./98,255.

Doses *per os* of 8 minims ($\frac{1}{2}$ Cc.) of a 1 per 5,000 solution of Cantharidin in Tincture of Orange well diluted with water have been found reliable in lupus, and in conjunction with mercury have proved beneficial in syphilis.—B.M.J. ii./02,1231.

Unguentum Cantharidis (*Off.*).

Cantharides, bruised, 1, Benzoated Lard 10, digested at 120° F. for twelve hours, strained, and pressed.

Might be replaced by 1 of Cantharidin in 3,000 of wax and oil basis.—P.J. i./98,255.

One part diluted further with two of soft paraffin forms a useful Pomade for stimulating growth of the hair.

Ceratum Cantharidis, U.S. Cantharides in No. 60 powder 32, heated with liquid paraffin 15, and yellow wax 18, rosin 18 and lard 17, mixed (*s.a.*).

Unguentum Cantharidum, P.G.iv. Cantharides 2, Olive Oil 2, Lard 2. Heat 10 hours in steam-bath, add Yellow Wax 1, Turpentine (oleo-resin) 2, Euphorbium in powder 1. For veterinary use.

Unguentum Cantharidin cum Hydrargyro Co. is sold as 'Pomade Max.'

Unguentum Hydrargyri Oxidi Rubri et Cantharidis, W. H. Blistering Liquid 15 minims, Red Mercuric Oxide Ointment to one ounce.

Potassii Cantharidas.

$$C_8H_{12}O\begin{matrix}COOK\\COOK\end{matrix},2H_2O=323{\cdot}92\ (326{\cdot}428\ \text{I. Wts.}).$$

Dose.—$\frac{1}{400}$ to $\frac{1}{200}$ grain (0·00016 to 0·00032 Gm.) hypodermically.

Prepared by heating Cantharidin 10 and Potassium Hydroxide $5\frac{3}{4}$, in Water 200, to dissolve, and crystallising by cooling. In minute white needles, soluble 1 in 25 of water. Has properties representative of Cantharidin, *q.v.*

CAOUTCHOUC. (*Off.*).

India Rubber. *Syn.* ELASTICA, U.S.

The prepared milk-juice of *Hevea brasiliensis* (*Euphorbiaceæ*) and probably other species; known in commerce as Pure Para Rubber.

Liquor Caoutchouc (*Off.*).

Caoutchouc 1, Benzol 10, Carbon Bisulphide 10.

In making this liquor it saves time to treat the rubber with the carbon disulphide alone for an hour or two to form a jelly, then the benzol may be added and the preparation be ready in 24 hours.

Antimony in red rubber: possible connection with appendicitis and other internal disorders.—L. i./05.1610.

The seeds of *Hevea brasiliensis* examined chemically. The oil forms 20% of the entire weight; might replace linseed oil.—J.C.S.A., April 1906, 247.

Bandages of rubber are (i.) webbed with strands of rubber (see also p. 374) for Elastic Circular Stocking and Indiarubber Webbing), (ii.) Statham's porous, (iii.) Martin's (solid) perforated and non-perforated.

Bed Sheets, rubber, are made with funnel and eyelet holes for attaching.

Bladder Irrigators consist of glass douche can with 5 foot rubber tubing, with stop-cock and rubber catheter; some have two-way metal pipe.

Bladder Syringes are of 4 or 5 ounce capacity, with glass or brass barrel. Herring's is of rubber with bayonet catch nozzle.

Bougies are solid elastic gum—

With bulbous end = à Boule, in sizes 1 to 16.
" " silk web " " 1 to 16.
Conical, pointed in shape " 1 to 12.
Cylindrical, not tapered at the end, various textures and materials—Sizes 1 to 16.
Œsophageal Bougies are bulbous, conical and cylindrical, of elastic gum.- Sizes 10 to 24.

Catheters.—Elastic gum, black and webbed, or silk web—

Bulbous (à Boule), sizes 1 to 16.
Coudé (bent at end).—Sizes 5 to 12.
Cylindrical.—Sizes 1 to 15, with or without wire Stilettes, and sizes 5 to 12 with hollow or solid ends.
Conical (simply pointed, *i.e.*, tapered), with wire Stilette.—Sizes 1 to 12.
Jacques' India Rubber, with solid or hollow ends.—Sizes 3 to 18.
Belfast linen Catheters are also prepared.

Catheter Cases for pocket, with compartment for lubricant or antiseptic, *e.g.*, Paraform.

Catheter Jars are made for hanging Catheters in an atmosphere rendered antiseptic with paraform.

Catheter Steriliser, Herring's, for sterilising elastic gum Catheters.

Web Catheters may be sterilised by boiling in nearly saturated solutions of Ammonium Sulphate or Sodium Chloride, with subsequent washing in sterile water.

Catheter Washers are made for affixing to water tap.

Catheters, Female, are of elastic gum, with Stilette, solid end, glass, straight or curved (Queen Charlotte's Hospital), metal, or soft rubber.

Cuppers are of rubber or glass, or glass with rubber ball.

Dental Rubber, manufactured of the finest para rubber and coloured. This is supplied in various shades of colour, *e.g.*, white, pink, red, orange, black. The varieties in commerce are designated 'Samson,' 'Doherty,' 'Gold Dust,' Ash's 'Whalebone,' and Jamieson's 'Horn.' The rubber is hardened by vulcanisation, and used to form a frame to carry artificial teeth. In vulcanising most rubber, especially Ash's, raise the temperature gradually until 315° F. or 100 lbs. pressure is obtained. Maintain this temperature or pressure 75 minutes to complete vulcanising process.

Drainage Tubing is of various dimensions, and is supplied in 5%. Phenol solution. It is convenient in glass tubes.

Elastic Hosiery comprise stockings, socks, knee caps, leggings, thigh pieces, knee hose, thigh hose, anklets, elbow pieces, cuffs, mitts. Measurements should be made from the limb first thing in the morning.

Eye Douches. Bowman's consists of rubber ball, with tubing and mount.

The Moorfields' Pattern, Douche Can with tubing.

The "Undine" is a glass flask with pointed spout.

Gutta Percha Tissue in ¼ yard, ½ yard, 1 yard pieces, and as required, is prepared from Gutta Percha, the dried milky juice of *Palaquium oblongifolium* and other varieties of *P.* (*N.O. Sapotaceæ*). Contains about 80% gutta similar to that of caoutchouc. Chemical examination of constituents of Gutta Percha.—Pharm. Central, 1905,654

Ice or Hot Water Bags for the ear, eye, head (helmet shaped), abdomen, spine, throat (collar shape).

Jaconet, white and pink.

Macintosh or **Waterproof Sheeting**, 44 inches wide (see also **Pegamoid**) is supplied :—

1. Double texture and double width.
2. Having rubber on both sides.

Nasal Douches or **Irrigators** are—

1. Of rubber tubing, with stop-cock for use as a *syphon*.
2. In the form of a *spray bottle* for spraying into the nostrils.
3. *Boat shape*, of glass, with aperture for covering with the finger, and thereby controlling the flow of liquid. This latter form is useful where a small quantity of solution is employed, as in a simple catarrh.

   Woakes' pattern has a rubber nozzle, and is similar.
4. *Syringe form*, consisting of rubber bulb or glass tube with piston, with shaped vulcanite or rubber nasal plugs.

Oiled Calico consists of calico treated with boiled oil, and thus rendered waterproof.

Oiled Silk is supplied (*a*) green, (*b*) in the non-adhesive (French) form of yellow colour, and (*c*) a further variety is brown in colour.

Oiled Silk Protective. This consists of oiled silk coated on both sides with copal varnish, and when dry, brushed over with Dextrin 1, Starch 2, Carbolic Lotion (1 in 20) 16.

Ovariotomy Aprons. Should be spread of lenticular shape, and the opening is preferred nearer one edge of the apron than the other, so that the free portion may be spread over the operator.

Pessaries are ball shape, butterfly, circular, oval, cradle, and ring form.

Plasters, spread:—

India Rubber, Adhesive, 7 inches wide, 1 yard and 5 yard rolls.

India Rubber Adhesive, Porous, 1 yard rolls.

" " (Mead's) Tapes, ½, ¾, 1, 1½, 2, 2½ and 3 inch, in both 5 and 10 yard lengths.

Rubber and Glass Dressing, new, for operating in fistula.—L. ii./05,1324. Sheet glass "21 ounce" also used as dressing after carbolising.—L. ii./05,1468.

Stomach Tubes.—That known as Van Valsah's, with bevelled "Velvet Eyes," is considered one of the best. For passing the tube a special Lubricant Glycerin Jelly is supplied in Collapsubes, or a Glyco-Gelatin Pastil of Menthol $\frac{1}{50}$, and Cocaine $\frac{1}{20}$ is useful. (*Vide* Examination of Stomach Contents.)

Sutures (*vide* Catgut, &c.).

Syringes—

1. Vulcanite and glass with rubber nozzle, "Glycerin" Injection.
2. India-rubber ball with soft rubber nozzle in one piece (ear and nose).
3. Rubber ball with bent glass nozzle (ear and nose).
4. Ball with conical vulcanite nozzle (Injection "Bottle").
5. Ear: Barrel shaped of glass or brass.
6. Enema, for rectal injection and vaginal douching.

Urethral, rubber ball, ½ ounce size, with bone pipe or elastic gum, short or long (Golding Bird's is a special form). Squire's is rubber, flattened in shape. See also Hypodermic Syringes.

Intra-laryngeal, new, with three apertures to ensure full distribution of fluid.—L. i./05,97.

Transfusion apparatus with improved canula complete in steriliser. The canula can be left *in situ* for further injection if necessary.—B.M.J. i./05,25.

CAPSICI FRUCTUS (*Off.*). U.S.

Dose—½ to 1 grain (0·032 to 0·065 Gm.), in a pill

The dried ripe fruit of *Capsicum minimum*, *C. fastigiatum* (*Solanaceæ*), U.S. Cayenne pepper is from Nepaul

Dose.—⅛ to ¼ grain (0·008 to 0·016 Gm.) in a pill

Capsicin. *Syn.* Oleo-Resin of Capsicum, U.S.

Prepared by exhausting capsicum fruit by percolation with acetone, distilling off the greater portion of acetone allowing the remainder to evaporate spontaneously in a warm place. Pour off the liquid portion, transfer the residue to a glass funnel, with a plug of cotton wool and, when the fatty matter (to be rejected) has been completely drained, mix the liquid portions.

1½ of acetone will exhaust (if percolated slowly) 1 o capsicum. Yield of oleo-resin 5 to 16%.—Caspari.

Gerrard found that Alcohol 90% is a good menstruum fo extraction. He prepares a 2 in 1 liquid extract, and from thi an ointment 1 in 10 with the official basis or hydrous lanolin also a plaster 10%.

Pilula Capsici Composita. Capsicum Oleo-resin ½ minim, Clove Oil ½ minim, Calomel 1 grain, Aloe 2 grains. For the atonic stomach of drunkards.—H

Emplastrum Capsici, U.C.H.

Oleo-Resin of Capsicum 5, Soap Plaster, melted, 95

Capsicum plasters in rubber combination are also made in sheets 7 in. by 5 in., and yard rolls 7 in. wide.

Gerrard's Improved Formula:—Evaporate th Alcohol from Liquid Extract of Capsicum (Gerrard 10, and stir into Resin Plaster 95. Contains 5% o Solid Extract.

U.S. has Oleo-Resin of Capsicum 0·25 Gm. brushed over adhesive plaster 15 Cm. square.

Emplastrum Capsici Mite (Mild Capsicum Plaster), R.D.H. (For dental use.)

Caoutchouc 10, Yellow Paraffin 1. Heat carefully so as to just liquefy, and add Resin 10, Powdered Orris Root 4, Finely Powdered Capsicum 4. Mix and spread on holland or linen and cut into pieces half the size of finger nail. Dry the gum thoroughly before application.

Emplastrum Capsici Forte (Strong Capsicum Plaster), R.D.H.

Prepare as above omitting the powdered Capsicum

Spread and brush the surface thinly with Oleo-Resin of Capsicum *q.s.* (Neither of these plasters contain lead.)

Fluidextractum Capsici, U.S.

Dose.—1 minim (0·05 Cc.) 1 = 1 Alcoholic Percolate. Gerrard favours the follow ng formula:—

Exhaust Capsicum 100 in fine powder (No. 60) by percolating with 90% Alcohol, distill off alcohol until the residual extract weighs 50, 1 of extract = 2 of drug, *i.e.*, double the strength of the U.S. preparation.

Unguentum Oleo-Resinæ Capsici, B.P.C.

Oleo-Resin of Capsicum, U.S.P. (was ethereal), 1, Yellow Wax ½, Benzoated Lard 4. Melt the wax and lard, add the oleo-resin and stir until cold. For use as the liniment. Is too strong for tender skins —will bear dilution 3 to 6 times.

Gyrol Pencils. A French specialty possessing the revulsive properties of Capsicum.

Tinctura Capsici (*Off.*). 1 in 20 of 70% alcohol.

U.S. 1 in Alcohol (94·9% vol.) 6, and water 4.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Given internally it increases the flow of saliva and gastric juice. It also increases the peristalsis of the intestine, relieves atonic dyspepsia, and is useful in dipsomania—it allays the craving for alcohol. The official tincture is too weak for external use as a rubefacient.

Tinctura Capsici Ætherea.

Prepared as official tincture, with pure ether *vice* alcohol. Can be applied more freely on account of rapid evaporation, *v.p.* 83.—L. i /90,1066.

Tinctura Capsici Fortior, B.P.C.

Dose.—1 to 3 minims (0·06 to 0·18 Cc.). Principally used externally. *Is practically identical with Concentrated Tincture of Capsicum* (Tu nbull).

Capsicum in No. 40 powder 1, Alcohol (90%) *q.s.* to 3. Is useful for chilblains, but only when the skin is not broken.

This is too irritating generally. The writer has found the following approved of:—

Liniimentum Capsici.

Capsicum Fruit in coarse powder 10, percolate with Alcohol (90%) to 70, and add Oleic Acid 10, Oil of Lavender ½. Painted on the skin, or applied sprinkled on piline or lint covered with American oiled cloth, in

an hour it produces a red glow; its action may be arrested by smearing the part with vaseline. Useful in chest affections, rheumatism, sciatica, &c. Does not blister or redden the skin, hence may be applied to exposed parts.

Linimentum Capsici Duplex is the latter preparation double strength.

Liquor Capsici Compositus. Linimentum Capsici Compositum, P. Austr.

Black Pepper 100, Capsicum Fruit 100, Venice Soap 25, Camphor 25, Alcohol 800; macerate 8 days, express, add Eugenol and Oil of Rosemary of each 5, Cinnamal 1, and Ammonia Solution (10%) 200. Sp. Gr. of the product is 0·88 to 0·90.

Linimentum Capsici, St. M's. H.

Capsicum Tincture 3, Compound Camphor Liniment 4, Methylated Spirit to 8.

Unguentum Capsici (*Off.*).

Capsicum Fruit, bruised, 12, Spermaceti 6 (better 9), Olive Oil 44. Heat on water-bath for 1 hour and strain. Resembles Smedley's Chillie Paste.

Alternative formula which is not wasteful of the fats:—

Liquid extract of capsicum (1 = 2 of drug, Gerrard) 60 grains, olive oil 1 ounce, spermaceti 60 grains, melt the fats and stir in the liquid extract. A more absorbent ointment would be liquid extract of capsicum 60 grains, hydrous lanolin 1 ounce 60 grains.

Capsicum Wool, Calorific Wool.—Oleo-resin of Capsicum 1, Ether, 30, Absorbent Cotton 19. Dissolve the oleo-resin in the ether, saturate the wool evenly with the solution and dry.

Alternative formula (Gerrard).—

Dissolve liquid extract of capsicum (Gerrard) 2 ounces in alcohol 90% 7 ounces. Pour the solution on to the cotton wool 9 ounces under pressure to saturate evenly. Dry and preserve in well closed cartons. Contains 10% solid extract. Colour with eosin, as otherwise the colour fades. Cover with oiled silk when applying to increase activity.

Very useful in rheumatic affections, bronchial and similar painful complaints where warmth relieves.

CARBONES.

Carbo Animalis. Animal Charcoal.

Was official in B.P., 1885, and is official in U.S., as is also **Carbo Animalis Purificatus** (by means of hydrochloric acid).

Carbo Ligni, U.S. Wood Charcoal.

Dose.—60 to 120 grains (4 to 8 Gm.).

Manufactured by burning wood, *e.g.*, willow, to red heat with access of as little air as possible.

Uses.—Given in cachets or as charcoal biscuits as an absorbent of gases in distension of the stomach, *e.g.*, in dyspepsia. Has antiseptic properties, and is also applied externally as a poultice to foul ulcers.

Cocoa Nut Charcoal has recently been employed by Dewar owing to its remarkable absorbent powers to improve high vacua. It is twice as absorbent as ordinary charcoal, and takes up ammonia and sulphuretted hydrogen, as also colouring matters, *e.g.*, fluorescein. The absorbent power is considerably increased at the temperature of liquid air, *e.g.*, a given amount will absorb the following proportions of gases—4 of hydrogen at ordinary temperatures, and 135 at the temperature of liquid air, nitrogen 15 and 155, oxygen 18 and 230 respectively. The effect is well seen in the case of a vacuum tube imperfectly exhausted containing the charcoal. On cooling with liquid air, and passing electric current through the tube, first the striæ, and afterwards the typical X-ray fluorescence appear. Helium is not absorbed, and by this method can be obtained as a residue from the air.

Charcoal containing absorbed gas is an exceedingly sensitive calorimeter. Thus charcoal, if charged with air and hung in a vessel of liquid air, is affected by the light of a candle brought near—through several thicknesses of glass and the liquid air.—C.D.i. 06,809.

CARBONIS TETRACHLORIDUM.

CCl_4=152·67 (153·8 I. Wts.).

A heavy, volatile, and mobile chloroform-like liquid, has a pleasant pungent, quince-like odour if pure. Sp. Gr. 1·56. The vapour inhaled relieves hay-fever. Employed locally, sprinkled on piline or lint covered with American oiled cloth, it quickly relieves neuralgic pains. Has been used as, but is not a successful anæsthetic.

CARMINUM.

A brilliant red colouring matter, containing about 50% Carminic Acid, $C_{17}H_{18}O_{10}$ = 379·27 (382·144 It Wts.), prepared from the cochineal insect—*Coccus Cacti* (*Hemiptera*), the dried fecundated female insect reared on *Nopalea Coccinellifera* and other species of *Nopalea*. The sun-dried insects, if killed by sulphur

or charcoal fumes, are silvery colour and designated "silver grain," owing to deposit of wax on the surface. If killed by hot water and dried artificially the "black grains" are produced. It is insoluble in water, but entirely soluble in aqueous ammonia. Is used to colour toilet preparations and for staining in microscopy.

Glycerinum Carmini.

Carmine 3, Distilled Water 3, Solution of Ammonia, B.P. 4; dissolve and add gradually Glycerin 18. Heat in a water-bath till free from ammoniacal odour. When cold add Solution of Ammonia 1 to prevent gelatinisation and Distilled Water *q.s.* to 24. Being nearly neutral it dilutes to a pure carmine colour without a purplish tint.

Carmalum.

Carminic Acid 1, Ammonia Alum 10, Distilled Water 200. Heat to dissolve. Cool and filter. Suitable for staining after osmic acid.—P.J. 1893,264; *cf.* Mayer's.

Liquor Carmini.

Carmine 1, Distilled Water *q.s.* to moisten, Strong Solution of Ammonia 1, dissolve, and add Distilled Water 10. Used to colour toilet preparations, &c.

Tinctura Cocci. (*Off.*) 1 in 10 Alcohol (45%).

Dose.—5 to 15 minims.

Liquor Cocci, Liquid Cochineal.

Cochineal (not bruised), Potassium Carbonate, of each 1, Distilled Water 8. Heat in water-bath for half an hour; gradually add Acid Potassium Tartrate 1, stir well, continue the heat, and add Potash Alum (in powder) 1; heat five minutes more, strain through absorbent wool, and pour over contents of strainer sufficient Distilled Water to make strained product measure 8; when cold add Chloroform ½% by volume.

CASCARA SAGRADA (*Off.*), U.S.

Syn.—Sacred Bark.

The dried bark of *Rhamnus purshianus* (*Rhamnaceæ*).

Dose.—3 to 15 grains (0·2 to 1 Gm.) in cachets.

Tschirch has isolated a principle anthra-gluco-sagradin, and similar principles from Rhubarb, Senna and Rhamnus.

The characteristic aperient action is not due to Emodin. Emodin is, however, a constituent, but chrysophanic acid or chrysarobin could not be found. Apparently no chemical

differences between one and three year old ('matured') bark. This was said to exhaust a ferment and to moderate the griping action which the fresh bark possesses.—B. & C.D. ii.04/.268.

U.S. directs to be collected at least one year before being used.

Assay of the oxymethyl-anthraquinone drugs.—Tschirch, P.J. ii./05,225,248.

Further methods of determination on colorimetric principles.—P.J. ii./05,229.

Ph. Ned. gives Microscopy of Powder.

Uses.—Cascara acts as a vegetable bitter, increases peristalsis, empties rectum, is useful for internal piles, and is a good laxative in habitual constipation.

Cascara Capsules (mild) represent half a drachm of Liquid, or about 6 grains of Solid Extract. Capsules of **double this strength** are also prepared.

Dose.—1, 2, or more. The mild are also prepared **with 1 grain Euonymin** in each in addition. *Dose*, 1 or 2 at bedtime.

Cascarin Le Prince. Prepared from an extract of the bark by precipitation with Sodium Carbonate. —Comptes Rendus, cxv., 286.

Cascara Jelly.

Dose.—1 to 4 drachms ("teaspoonsful"), equivalent to Cascara Extract ½ to 2 grains. Suitable for the treatment of habitual constipation.

The agar-agar basis renders the faeces more voluminous and richer in water. The Cascara Extract produces the stimulating action on the bowels.

The preparation is agreeably flavoured, but if desired the taste may be covered by taking with a little jam.

Regulin is stated to have similar composition.

Pararegulin consists of liquid paraffin with 10% Cascara. Capsules contain 45 grains (3 Gm.).—Muench. Woch., Oct. 10, 1905.

Syrupus Cascaræ Aromaticus (*Off.*).

Syn. **Elixir Cascara Sagrada, B.P.C., 1894.**

Tincture of Orange 2, Alcohol (90%) 1, Cinnamon Water 3, Syrup 6, Liquid Extract of Cascara 8.

Dose.—½ to 2 drachms (1·8 to 7 Cc.). Very small doses three times a day are pleasantly laxative. The taste is agreeably disguised.

Orange, Coriander, Anise, Cassia and Liquorice all mask the unpleasant taste of Cascara.—P.J. ii./01, 151.

Extractum Cascaræ Sagradæ (*Off.*).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.) in pill.—An aqueous extract (*Cascara Sagrada* should be indeclinable, being Spanish and not Latin).

Extractum Cascaræ Sagradæ Liquidum (*Off.*).

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

Is an aqueous extract preserved by the addition of one-fourth its volume of alcohol (90%). Deposits on keeping, and ferments in hot climates; the writer prefers alcohol (20%) as a menstruum. With this a more active preparation is formed. It may be made miscible with water by the addition of half its volume of sal volatile.—P.J. 1891,250; 1892,827. 25% more alcohol would improve its keeping qualities.

110 minims on evaporation on a water bath for 4 hours should yield not less than 20 grains of residue.

Ph. Ned. 1=1. Evaporated should yield 25% solid residue. **P. Belg.** is similar.

Extractum Rhamni Purshiani Fluidum, P. Austr. 1=1. Leaves 20% extractive on evaporation.

Fluidextractum Rhamni Purshianæ, U. S., 1=1 alcohol 40% approx. *Dose.*—15 minims.

Fluidextractum Rhamni Purshianæ Aromaticum, U.S. *Average dose.*—15 minims (1 Cc.) 1=1. A glycero-hydro-alcoholic percolate containing liquorice and magnesia flavoured with compound spirit of orange. Sometimes called "Aromatic Cascara" in the States. The magnesia is said to destroy the bitter taste, as also in—

Extractum Cascaræ Sagradæ Liquidum Insipidum, B.P.C.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

The bark in powder mixed with 10% of light magnesia, is made into a paste with water, and dried, then powdered and percolated with alcohol (60%). The first 85 of percolate is reserved and the remainder concentrated to a soft extract, mixed with the reserved liquid and alcohol (90%) *q.s.* to 100.

Extractum Rhamni Purshianæ, U.S. 1 of Extract = 4 of Drug, Hydro-alcoholic percolation and final adjustment with glycyrrhiza. The powder keeps well. *Average dose.*—4 grains.

Vinum Rhamni Purshiani, P. Austr. *Dose.*—1 to 3 drachms (3·5 to 10·5 Cc.). *Vide also* Vinum Cascara, *p.* 222.

Malaga Wine 150, Fluid Extract of P. Austr. 100, Syrup of Orange Peel 50. Digest 8 days and filter.

Mistura Cascaræ. Gt. Orm. H.

Liquid Extract of Cascara, Liquid Extract of Liquorice, Syrup of Orange Peel, Chloroform Water, of each 15 minims for one dose.

Mistura Cascaræ Composita.

St M.'s H. Liquid Extract of Cascara 1 drachm, Liquid Extract of Liquorice ½ drachm, Sodium Sulphate 1 drachm, Ammonia Solution 5 minims, Water to 1 ounce.

St. Th. H. has Liquid Extract of Cascara 30 minims, Liquid Extract of Liquorice 30 minims, Sal Volatile 20 minims, Chloroform Water to 1 ounce.

Mistura Hepatica. *Dose.*—1 to 2 drachms in water. Liquid Extract of Cascara 20, Tincture of Jalap 20, Tincture of Podophyllum 10, Compound Tincture of Gentian 10, Chloroform Water 50, Sal Volatile 10.

Mistura Laxativa, U.C.H. *Dose.*—¼ to 1 ounce.

Liquid Extract of Cascara 1 drachm, Liquid Extract of Liquorice 1 drachm, Sodium Bicarbonate 5 grains, Chloroform Water to 1 ounce.

Pastils of Cascara each contain 2½ grains of Extract, and are coated with Tolu. *Dose.*—1 or 2.

Pilula Cascaræ Composita.

Extract of Cascara 1½, Extract of Nux Vomica, Alcoholic Extract of Belladonna, of each ⅛, Milk Sugar 1. In grains for one pill, or in grammes for fifteen.

Dose.—One before dinner or at bed-time.

Is an agreeable and efficient aperient, has certain and gentle action continuing beyond the first day; good for constipation and liver inaction.—B.M.J. ii./93,596.

Syrupus Cascaræ Sagradæ, B.P.C.

Liquid extract of cascara sagrada 4 ounces, liquid extract of liquorice 3 ounces, carminative tincture 2 drachms, syrup sufficient to produce one pint. Mix.

Dose.—As an aperient, 1 to 4 drachms (3·5 to 15 Cc.); or for children, one-half to a teaspoonful, according to age. As a laxative, small doses should be taken three times a day.

Tablets, plain or sugar coated, 1, 2, 3, 4, and 5 grains.

Dose.—1 or more according to size.

Tinctura Cascara Sagrada.

Percolate 1 to 5 with Alcohol 60%.

Laxative dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Tinctura Laxativa.

Dose.—20 to 60 minims (1·2 to 3·5 Cc.)

Liquid Extract of Cascara Sagrada 2, Aromatic Spirit of Ammonia 2, Spirit of Chloroform 2, Tincture of Belladonna 1, Tincture of Nux Vomica 1. This is an agreeable and elegant form of administering cascara, being miscible with water.—B.M.J. ii./93,596.

Trochisci Cascara Sagrada et Olei Menthæ Piperitæ.

These are made with fruit basis, contain 2½ grains of Extract flavoured with Peppermint, and have a useful purgative and corrective action. *Dose.*—1 or 2.

Vinum Cascara, *Martindale. Vide also p.* 221.

Dose.—½ to 1 oz. (15 to 30 Cc.).

Liquid Extract of Cascara 1, Sugar 1, Aromatic Elixir 1, Sherry to 20. Mix and decant from any sediment which may form on standing.

Purgatin. Anthrapurpurin Acetate.

Dose.—7½ to 15 grains (0·5 to 1·0 Gm.).

A synthetic oxy-anthraquinone. A tasteless, mild aperient which colours the urine red and stains the linen.—M. 01,153; B.M.J. i./02,1278; L. i./02,1475.

Exodin. *Dose.*—7½ to 24 grains (0·5 to 1·5 Gm.).

A similar oxy-anthraquinone derivative, a yellowish powder with laxative properties. Constitution and formula:—J.C.S.A. i /04,902. Tablets contain 0·5 Gm.

CAULOPHYLLIN.

Dose.—1 to 4 grains (0·065 to 0·26 Gm.).

A brown resinoid powder obtained from the root of *Caulophyllum thalictroides*—blue cohosh, pappoose, or squaw-root. It possesses diuretic, diaphoretic, and anthelmintic properties, and is used as an emmenagogue, parturient, and antispasmodic. It appears to exert a direct influence on the uterus.

CEREVISIÆ FERMENTUM.

Syn. FÆX MEDICINALIS. *Dose.*—½ to 1 ounce.

Uses.—Yeast is in use to add to poultices for application to unhealthy and sloughing wounds. Internally

it is given to check the growth of boils, especially when they recur time after time; by some is considered to be a good remedy for diabetes, enabling patients to take more carbohydrates, and it is prescribed for septic endocarditis.

In acne from half a teaspoonful to a tablespoonful of fresh yeast with a little water may be given with meals.

Yeast dried at 30° C. is recommended in doses of 0·5 Gm. for constipation, given in keratinised capsules and tablets; it is a light grey powder (P.J. i./01,145), and is injected per rectum to break up fæces. Recently tried in tuberculous affections and in dysentery.

Emulsin is a constituent of yeast, presence proved by action on amygdalin *q.v.*; production of distinct odour of bitter almond.—P.J. i./06,7.

It is also a constituent of orchid roots.—P.J.i./06,12.

Levurine, Furonculine, Levuretine (COUTURIEUX) and **Zymin**, made by dehydrating yeast by means of acetone, are specialties prepared from yeast.—P.J. ii./03,547.

Dose of any of the above.—A teaspoonful with meals in beer or sweetened water. Zymin is also taken mixed with equal quantity of sterile cane sugar.

Levure Medicinale. *Syn.* JACQUEMIN'S THERAPEUTIC YEAST.

A convenient method of administering actively growing yeast. The following directions are supplied:—

Pour the ferment in the small bottle into the larger one containing the unfermented grape juice. Cork down and keep warm 48 hours. The fermentation will then be complete. One tablespoonful of the fermented juice is to be given with a small piece of sugar about an hour before each meal. After the third day the bottle should be opened with care owing to the accumulation of carbonic acid and should then be kept in a cool place.

Full account of experiments, therapeutic trial on diabetic patient giving 1,800 grains sugar per diem, together with comparison with furonculine and zymin.—B.M.J. ii./05,352.

Levurine Tablets are prepared, each equivalent to one drachm of fresh yeast.—B.M.J. ii./05,1348.

Marmite is said to be the juice of yeast, which on evaporation yields a brown extract resembling a meat extract in smell and taste.—L. i./03,530.

A modified Fehling Solution for detection of yeast extracts. The efficacy disputed (P.J.i./04,86); but is supported (C.D.i./04,216).

Yeast Soaps and compounds with Ichthyol, Salicylic Acid and others are made for use in abscess, acne, and dermatitis.—B.M.J.E. ii./04,28.

Erysipelas treated with yeast with good results.—B.M.J. ii./05,1348.

Phthisis treated, with influence on opsonic index. There is an increase in leucocytes in the blood on giving yeast—said to be due to the Nuclein.—L. i./05,1493.

Phlyctenular keratitis cured by 4 Gm. doses daily of dry beer yeast with customary local applications.—Oph., May, 1906,302.

Nuclein.—*Syn.* **Nucleol.**

Dose.—15 grains several times daily.

This is stated to be obtained from yeast, and to represent the active principle. It tends to stimulate the formation of white blood corpuscles, and hence to the destruction of the bacilli of disease. Nuclein is considered to be a compound of Nucleinic Acid with albuminates and hydrocarbons.

Good results have been obtained from injections of Nuclein in tuberculous patients. The method of De Backer in the cure of tubercle and cancer.—B.M.J. ii./97,802.

Yeast and Nuclein suggested as a treatment for endocarditis.—B.M.J. i./98,936; L. ii./99,1225.

Nuclein Solution 5%. A specialty.

Dose.—10 to 60 minims by mouth or hypodermically.

Tablets, 1 grain (0·065 Gm.).

Septicæmia, obscure cases treated with advantage.—B.M.J. i./00,1342; L. i./00,1591.

Acidum Nucleinicum.

A white amorphous powder, only slightly soluble in water, but more soluble in the presence of a sufficiency of Sodium Hydroxide. Insoluble in Alcohol. 5% aqueous solutions have principally been utilised.

Dose.—15 minims. (1 Cc.) of this solution hypodermically. *Per os* 4 or 5 times this quantity.

Has been used in treatment of anæmia, scarlet fever and puerperal fever, also in tuberculosis.

Nargol, Mercurol and Cuprol are compounds of Nucleinic Acid with respectively Silver (L. ii./00,1742), Mercury and Copper (P.J. ii./00,305). Cuprol and Nargol are of use in granular ophthalmia in the form

of 5% instillations. Nargol is soluble in water 1 in 4. Contains about 10% of silver.

Cydrase. The dried ferments of cider. A French specialty for use in rheumatism.—F.N. 1906,59.

CERIUM.

Ce = 139·2 (140·25 I. Wts.).

This element, in addition to lanthanum and didymium, occurs as silicate in the form of cerite and as phosphate in monazite, also in samarskite and gadolinite.

Cerium has Sp.Gr. 6·7, Lanthanum 6·1, and Didymium 6·5. The last-mentioned has been split up into Praseodymium = 140·5 (I. Wts.)., and Neo-dymium = 143·6 (I. Wts.).

Cerium possesses a variable valency or habit of chemical combination. It is, like aluminium, either trivalent, or in some compounds apparently tetravalent, or even hexavalent as in the peroxide CeO_3, in this respect differing from the majority of the rarer earth metals and resembling the elements which are known to possess physiological action, for example iron, arsenic, antimony and iodine.

It seems likely, therefore, that some of the organic compounds of Cerium may prove of utility therapeutically. So far in this direction the oxalate only has been employed, which salt one would expect to have the therapeutically unsatisfactory properties of oxalic acid. Dr. G. T. Morgan has recently put forward cerium sulphocarbolate as a salt worthy of a trial.

Cerium oxide is contained in incandescent gaslight mantles. The filament in Nernst lamps is said to contain zirconia and yttria.

Rutile is the ore titanium dioxide used in leather dyeing.—C.D. i./05,613.

Cerii Oxalas. (*Off.*), **U.S.** (Ph. Helv., Ned., Jap.).

$Ce_2(C_2O_4)_3$, $9H_2O$ = 701·34 (706·644 I. Wts.).

Syn. CER OXYDULOXALAT (German).

Dose.—2 to 10 grains (0·065 to 0·3 Gm.). U.S. *Average Dose.*—1 grain.

A white crystalline powder insoluble in water. When incinerated it loses 53% of its weight. U.S. and B.P. allow a proportion of didymium and lanthanum oxalates.

Uses.—Is given in vomiting, particularly that of

pregnancy, also in chronic diarrhœa, hysteria, epilepsy and migraine. Quantitative determination of cerium oxalate.—J.S.C.I. 1900, **19**, 636.

Cerii Sulphocarbolas. — *Syn.* CERII PHENOL-SULPHONAS. *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.) $Ce_2[C_6H_4(OH)SO_3]_6$=1309·2 (1319·1 I. Wts.) (+Aq.)

A well defined crystalline salt resembling the corresponding thorium body in appearance (*vide* p. 697).

The following Salts of Cerium are also obtainable commercially,—Cerium Ammonium Nitrate; Cerium Chloride, Nitrate, Oxide, Acetate, Benzoate, Bromide, Bromate, Carbonate, Citrate, Hypophosphite, Iodide, Lactate, Malate, Salicylate, Sulphate, Valerianate. Also Bismuth-cerium Oxalate, Bismuth-cerium Valerianate and Bismuth-cerium Salicylate (*vide* p. 179).

Cerium sulphate is used for estimation of nitrites—M. 1906.

CHLORAL HYDRAS, (*Off.*), U.S.

$C Cl_3.CH.(OH)_2$=164·15 (165·374 I Wts.).

TRICHLORETHYLIDENE GLYCOL.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) in aqueous solution, or in chloroform water well diluted.

This compound is obtained by the action of dry Chlorine upon Alcohol. Chloral-alcoholate, the principal product of the reaction, is then decomposed with Sulphuric Acid. Chloral thus produced is hydrated by bringing it in contact with the necessary quantity of water, warming to about 50° C., and allowing it to cool.

Soluble, 4 in 1 of water, 5 in 1 of alcohol, 2 in 1 glycerin, 2 in 1 of ether, and 1 in 3 of chloroform, likewise soluble in oils and fats.

Chloral Hydrate heated first liquefies, then boils and volatilises without residue; 5 grains may be made into a pill with ½ grain Canada balsam, or with a little syrup and tragacanth.

Uses.—As a hypnotic, it is often combined with opiates, morphine, or bromides, but it is incompatible with quinine. Its use is contra indicated in heart affections, Bright's disease, and when the vital force is very weak.

Has a direct sedative action on heart muscle, resembling that of chloroform.—Dixon.

Antidotes to Chloral.—Stomach pump or emetics, followed by amyl nitrite, coffee, electricity, oxygen, picrotoxin, or strychnine. It is useful as an antidote to poisoning by strychnine, and as a remedy for tetanus.

Tetanus, recovery from, under large doses of chloral. —Pr. xlvii.132; B.M.J. ii./01,475; ii./04,1460.

Incompatible with alkalis, ammonium salts, potassium permanganate, and with bromides and alcohol, —chloral-alcoholate may separate.— P.J. i./04,215. Liquefies with camphor, *q.v.*

Severe chorea successfully treated.—L. ii./89,205.

Sea-sickness. Drachm doses of a mixture of 2 drachms of the syrup with 30 grains ammonium bromide, made up to 1½ ounces with water.—B.M.J. ii./04,1405.

Examination, method of titration.—Y.B.P. 1900, p. 92.

Isopral. *Dose.*—5 to 15 grains (0·32 to 1·0 Gm.).

Trichlorisopropyl alcohol prepared by acting on chloral (for which it is a substitute), with methyl magnesium chloride or bromide and decomposing the resulting product with water. A crystalline body slightly soluble in water. Hypnotic but not so poisonous as chloral.— P.J. i./05,921; B.M.J.E. ii./05,4, 79. Must be kept in a closed glass vessel and in a cool place, being volatile. In various forms of mental disease, *e.g.*, epilepsy, mania, melancholia, a safe hypnotic. Use in gastric ulcer contra-indicated on account of its caustic power.

Preparations.

Chloral Camphoratum, B.P.C. (Pigmentum Chloral et Camphoræ, T.H.)

Chloral Hydrate 1, Flowers of Camphor 1.

Rub together in a warm mortar until completely liquid and filter. It remains permanently liquid at ordinary temperatures, and forms a valuable application painted on painful parts in neuralgia and rheumatism. It mixes freely in alcohol, ether, oils, and fats, but the camphor is precipitated on adding to water or glycerin.

The compound (chloral and camphor) dissolves the alkaloids atropine, morphine, and veratrine to the extent of 1 in 30 or more, but their salts are less soluble in it. Liquefactions of a similar kind take place on mixing and gently heating respectively chloral hydrate 1 with menthol 1, or phenol 3, or thymol 1. Quinine salts and chloral hydrate also form liquid combinations.

In fibrositis the mixture of chloral hydrate, camphor

and menthol is found to be the most satisfactory treatment. Painted over the part, then gently rubbed in with the fingers.—Luff, Clin. Jl., Oct. ii./05.

Pigmentum Chloral Compositum.—W. H. has Chloral Hydrate 1, Menthol 1, Thymol 1, Camphor 3. Is Linimentum Chloral Compositum.—R.D.H.

Chloral Tannin.—Mix Chloral Hydrate 1 with Tannin 1, melt together on a water bath. Is used as

Chloral Tannin Solution—*Syn.* Caprol.

Stir in whilst hot to 2 parts of the above, water 8. Is used for strengthening the hair.—P.J. ii./99,148.

Chloral Hair Stimulant.—Chloral hydrate 5, Ether 25, Glacial Acetic Acid 1 to 4 (strong). Weak form:—Chloral hydrate 1 to 4, Ether 25, Glacial Acetic Acid ½ to 2.—M.A., 1906,99.

Liquor Bromo-Chloral Compositus, B.P.C.

Dose.—½ to 2 drachms (1·8 to 7 Cc.). 1 drachm contains 10 grains each of Chloral Hydrate and Potassium Bromide.

Chloral Hydrate 1600 grains, Tincture of Indian Hemp 400 minims, Tincture of Fresh Orange Peel 400 minims, Henbane Juice 1600 minims, Syrup 3¾ ounces, Liquid Extract of Liquorice ½ ounce. Dissolve, add Potassium Bromide 1600 grains dissolved in Distilled water 7 ounces, filter, and add Distilled water to 20 ounces.

Resembles the American hypnotic **Bromidia** which is stated to contain in each drachm chloral hydrate 15 grains, potassium bromide 15 grains, extracts of cannabis and of hyoscyamus ⅛ grain each.

Dose.—½ to 1 drachm in syrup or water.

For the analysis of a large number of **Patent Medicines**, *vide* L. ii./03,1492.

For those used in epilepsy, *i.e.*, Ozerine, Taylor's anti-epileptic medicine, Osborne's mixture, *v.* B.M.J. ii./04,1585.

Suppository of Chloral.

Chloral Hydrate 5, Oil of Theobroma 10. In grains, for one suppository, in grammes, for fifteen.

Pound together and press into the mould. Heat must not be applied, or the mixture will not set firm. It is useful in infantile convulsions, where nothing can be administered by the mouth. It should be forcibly retained for a few minutes with the finger, if necessary. It is locally irritating.

Sea sickness, obstinate, well treated by 20 to 30 grains per rectum.—B.M.J. i./05,1090.

Syrupus Chloral (*Off.*). *Dose.*—½ to 2 drachms (1·8 to 7 Cc.). Contains 10 grains in 1 drachm.

Chloral Hydrate 80 grains, Distilled water 1½ drachms. Dissolve and add Syrup *q.s.* to 1 ounce.

Tablets of Chloral, 5 and 10 grains (0·32 and 0·64 Gm.), *to be dissolved—not to be swallowed whole. Dose.*—1 or more.

Chloralamide.—*Syn.* CHLORAL FORMAMIDE, **P.G.** Choral Formamidum, **U.S.**

$CCl_3CH(OH)NH.COH$=191 (192·422 I. Wts.).

Dose.—15 to 45 grains (1 to 3 Gm.), in weak spirituous or acidulated solution.

In colourless inodorous shining crystals with a faintly bitter taste; soluble about 1 in 20 of water, 1 in 2 of alcohol. Should not be heated over 120° F. (with care in dispensing), or it is decomposed—melts at 114–115°C. It is incompatible with alkalis.

Recommended as a hypnotic, specially suitable in neurasthenia, spinal affections, and heart disease. Has no analgesic action, and has proved unsatisfactory in phthisis. An increase of dose is not required by continued use. Undesirable effects are less frequent and less marked than from chloral, but action is less rapid.

Is less toxic to cardiac muscle than chloral.—Dixon.

Useful in nervous affections, mania, and the insomnia of phthisis and typhoid.

Insomnia of enteric treated with.—B.M.J. ii./04,1452.

Elixir Chloralamidi. *Dose.*—1 ounce (30 Cc.)= 30 grains (2 Gm.).

Chloralamide 2 Gm., Alcohol 5 Cc., Aromatic Syrup 5·4 Cc., Glycerin 15 Cc., Water *q.s.* to 30 Cc.

Haustus Chloralamidi, G.H.

Chloralamide 30 grains, Mucilage Mixture (*v.p.* 129) to 1 ounce, for one dose.

Chloralamide renders breathing slower, quickens heart action, and produces nervous excitement, ending in sleep.—B.M.J. ii./90,50.

Successful in insomnia, no disagreeable effects. Tolerated for weeks in one case, once 30 grains failed on ninth night.—Report of Therapeutic Committee, B.M.A. —B.M.J. ii./90,237; Pr. xlv.216; P.J. 1890,104.

Results in insomnia without pain reliable, but not reliable with acute pain. No after depression, no interference with temperature or digestion, no craving induced; tolerance not readily reached. Giddiness and headache sometimes followed.—B.M.J. i./91,1060; Th. Gaz. 1891,418; M.C. Jan. 1892,251; Pr. xlvii.274.

Tablets, 5 grains (0·32 Gm.). *Dose.*—3 or more.

Chlorobrom.—Under this name a specialty containing 30 grains each of chloralamide and potassium bromide in an ounce, flavoured with liquorice, is recommended for insomnia and sea-sickness.

Dose.—½ to 1 ounce.—L. i./92,517; B.M.J. i./92,1329; L. i./95,90.

Chloralimide. $CCl_3CH{:}NH = 145{\cdot}33$ (146·406 I. Wts.). *Dose.*—20 to 45 grains (1·3 to 3·0 Gm.).

A white crystalline compound soluble in alcohol, but only slightly in water. Is used to relieve headache and induce sleep.

Chloralose. *Syn.* ANHYDRO-GLYCO-CHLORAL. $C_8H_{11}Cl_3O_6 = 307{\cdot}13$ (309·438 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.), in cachet.

In white crystals M.P. 187°C, formed by the action of chloral on glucose; slightly soluble in water, with bitter taste. Is a useful hypnotic, inducing restful and dreamless sleep without irritation of stomach or intestines, or other disagreeable after-effects. Is less successful in pains of gout or neuralgia. Some cases of ill-effects have followed its use, especially in large doses.

More powerful than chloral, but absorbed more slowly.—Dixon.

Somnal. *Syn.* ETHYLISED CHLORAL-URETHANE.

Dose.—30 to 45 minims (2 to 3 Cc.).

This is a solution of Chloral Urethane in Alcohol, and is said to be an efficient soporific.

CHLOROFORMUM (*Off.*) U.S.

$CHCl_3 = 118{\cdot}48$ (119·358 I. Wts.).

Syn. TRICHLORO-METHANE; FORMYL TERCHLORIDE.

Dose.—1 to 5 minims (0·06 to 0·3 Cc.), in mucilage and water, or in a perle; 3 drops = 1 minim. Small doses may be given as chloroform water or spirit of chloroform.

Chloroform is now largely prepared by the action of

chlorinated lime on acetone, as well as from both methylated and duty-paid alcohol.

Acetone Chloroform specially prepared for anæsthesia, is for convenience kept in one-quarter, one-half, and one pound amber-coloured, stoppered bottles.

Chloroformium pro Narcosi, P. Austr., and **Chloroformum ad Narcosin, Ph. Ned.**, are carefully tested for impurities.

This well-known anæsthetic is soluble in all proportions in absolute alcohol, pure ether, fixed and volatile oils, and 1 in less than 200 of water (this should not give a greasy stain to the bottle). It does not mix with glycerin. It is a solvent of mastic and most resins, many alkaloids, iodine, bromine, and of phosphorus and sulphur sparingly. It also dissolves gutta-percha and india-rubber. It acts on india-rubber even when vulcanized. Chloroform, according to the Pharmacopœia, has Sp. Gr. 1·490 to 1·495, boils between 60° and 62°C., and contains about $\frac{1}{2}$ per cent. by weight of ethyl hydroxide (alcohol), which prevents its decomposition. Absolute Chloroform has Sp. Gr. about 1·5002 at 15°C.; boils at 61°C.; it decomposes on exposure to sunlight and air, with formation of free chlorine and of carbonyl chloride or phosgene; the addition of alcohol is sufficient to check this change if kept cool, away from sunlight, and in full stoppered bottles. If shaken with one-tenth its volume of sulphuric acid for 20 minutes, neither the acid nor the chloroform should be more than faintly tinged, nor should the acid, if separated and diluted with three volumes of water, develop more colour or disagreeable odour. On further dilution with five volumes of water, this liquid should still remain transparent and colourless, and the addition of silver nitrate solution to it or to water which has been shaken with the separated chloroform, should cause no further opalescence. It leaves no residue or unpleasant odour during or after spontaneous evaporation. If chloroform be shaken with twice its volume of distilled water, the latter should not redden litmus; with solution of silver nitrate or baryta water it should cause no turbidity; nor should zinc iodide and starch paper be coloured by its vapour, the liberation of iodine indicating decomposition and the presence of

chlorinous compounds. Of these, carbonyl chloride is unaffected by shaking with mercury, which combines with free chlorine. The presence of alcohol in chloroform protects it by combining with the decomposition products, rendering them innocuous (chlorine is converted into hydrochloric acid*); the addition of ¼% by weight to absolute chloroform produces Sp. Gr. 1·497, but if more be added it makes the Sp. Gr. too low to guarantee its original purity,—if 1% be added the Sp. Gr. is reduced to 1·4854.—P.J. 1892, 229; 1893, 792, 1005, 321; 1894, 630. Chlorine cannot be detected until sufficient has been produced to combine with all the added alcohol.—P.J. 1895, 836.

A death after anæsthesia from chloroform, nitrous oxide gas and oxygen.—L. i./99, 1095.

Relative values of Chloroform from acetone and from alcohol.—J.C.S.T. 1904, 949; L. i./05, 589, 747.

2% chloroform vapour acknowledged safe for anæsthesia.—B. M.J. ii./03, 141; ii./04, 161; L. ii./04, 1856; J.C.S.A. ii./04, 756. More administered suddenly, dangerous.—Dixon.

Combined Use of Chloroform and Oxygen.—The administration of oxygen with chloroform as an anæsthetic is said to greatly decrease the danger of the anæsthetic. This method is sometimes conducted by passing the oxygen through a wash-bottle containing the anæsthetic. By this means, however, the quantity of the chloroform or ether is relatively small in comparison with the oxygen passed through. Hare suggests for alternative use a funnel-shaped leather inhaler containing a piece of spongiopiline or felt. In the upper surface of the leather inhaler is a small metal tube for connecting with the oxygen supply. By this means a definite quantity of anæsthetic is given and the amount of oxygen can be varied as desired.

Chloroform and ether are used locally in neuralgia sciatica and similar affections, and by Kataphoresis, *q.v.*

* Thus, instead of Hydrochloric Acid and Carbon Oxychloride, there are formed trichloral and various esters of Hydrochloric Acid. The alcohol is first oxidised to aldehyde by the chlorine, free hydrochloric acid being formed. The aldehyde combines with the free chlorine, forming finally trichloraldehyde. The hydrochloric acid combines with the alcohol, as long as the latter is in excess, to form esters.—P.J. ii./03, 326.

Antidotes.

Instructions for treatment if dangerous symptoms arise during administration of chloroform. See that the airway is clear and the clothing loose. Place the patient upon the floor with a pillow under the shoulders, and, with the tongue held forward, begin artificial respiration with oxygen at once; apply weak ammonia vapour and **Amyl Nitrite** to the nostrils and inject hypodermically 1 drachm of ether or brandy* or $\frac{1}{30}$ grain of strychnine. Hot flannels should be placed over the heart. Atropine injection is useful. As final measure Faradism or acupuncture of the heart should be tried.—R.D.H.

Inversion of the body, has frequently saved patient.

Unpleasant effects may arise from decomposition of vapour by flame of artificial light in confined space.

If $\frac{1}{4}$ grain of morphine be first injected hypodermically, less Chloroform is needed, the insensibility is more profound, and the danger attending its use is lessened. Strychnine has also been suggested.

Vegetable and animal infusions and decoctions can be preserved indefinitely by the addition of 1 minim of Chloroform to the ounce of liquid, if vessels containing be well closed. The Chloroform should be mixed with double its volume of rectified spirit before adding to the fluid to be preserved.

References to Chloroform.

Report of the Hyderabad Commission.—L. i./90,149.

The conclusions of Sir Lauder Brunton on the Commission.—B.M.J. ii./91,1088; L. ii./95,20,84,143.

Discussion on the treatment of anæsthetic emergencies.—B.M.J. i./98,377; L. i./01,1041.

Note on mode of dying during chloroform anæsthesia.—L. i./98,329; B.M.J. i./02,951.

B. M. A. Report of Special Chloroform Committee (1904–5).—B.M.J. ii./05,180. Report on action of Chloroform (MacWilliam).—B.M.J.ii./90,831,890,948.

With due care the use of Chloroform is certainly quite as safe as ether, while its effects are infinitely less disagreeable to the patient both during and subsequent to

* Brandy Sterules and Ether Capsules are handy to carry in the operating bag.

inhalation (Lombe Atthill).—B.M.J. i./92,110; Reply by Lawrie, 651. A discussion.—B.M.J. ii./04,720.

Report of the Lancet Commission on Anæsthetics.—Chloroform is a comparatively safe body, but not in any case devoid of risk. Heart failure preceded cessation of respiration in great majority of cases.—L. i./93,629, 693,761,899,971,1111,1236,1479.

Chloroform inhalation combined with morphine hypodermically in acute maniacal delirium.—L. i./93,861.

Inadvisable to continue the general use of chloroform, seeing that its death-rate is 1 in 2,300 cases, while A.C.E. is 1 in 5,000, ether 1 in 13,500, and nitrous oxide almost nil.—B.M.J. ii./97,160.

Recovery under strychnine after drinking two ounces.—B.M.J. ii./97,1498; *see also p.* 236.

By the aid of Vernon Harcourt's "Chloroform Regulator," the exact percentage of chloroform used is gauged; never more than 2% is necessary.—L. i./03,800.

In phthisis inhalation with a little eucalyptus oil, palliative; the chloroform acts as a bactericide.—B.M.J. i./06,198.

Anæsthetics form unstable compounds with the proteids of the tissue cells and the anæsthesia is due as a result of these combinations to the paralysis of the chemical activities of the protoplasm. Chloroform is more soluble in serum than in water. Royal Society Paper Report.—B.M.J. i./06,101.

Anæsthetic Preparations of Chloroform.

Glass Capsules of Chloroform.

Encased in cotton wool and silk; contain 10 minims in each. Are convenient for use in asthma, &c.; may be fractured and used by the patient while in bed. Also containing 20, 30, and 60 minims—the last for obstetric purposes, avoiding risk of overdose.

Gelatin Capsules of Chloroform.

Contain each 5 minims; are for similar uses, but the chloroform is apt to volatilise; *see also* Perles, *p.* 237.

Capsules of Chloroform with Ethyl Iodide, *v.p.* 92.

A.C.E. (Alcohol, Chloroform and Ether).

Absolute Alcohol, Sp. Gr. 0·795, 1; Chloroform, Sp. Gr. 1·497, 2; Purified Ether, Sp. Gr. 0·720, 3; Sp. Gr.

about 1·01. The three ingredients are intended to evaporate uniformly.

A.C.E. is as effective as pure Chloroform, and a safer agent when deep and prolonged anæsthesia is to be produced, while at the same time it is sufficiently rapid in its operation to be convenient for general use, although it takes a longer time than Chloroform (10 to 15 minutes) to procure anæsthesia. It is of service in midwifery. Several deaths have, however, occurred under administration of A.C.E. Rate calculated 1 in 5,000 administrations.—B.M.J. ii./97,160.

By means of a "Wick Vapouriser" the exact proportion of chloroform to air can be determined chemically. —B.M.J. ii./04,1686.

C.E., *i.e.*, a mixture of chloroform one part with ether two parts, is an even better anæsthetic mixture, because after the use of A.C.E. the inhaler becomes saturated with alcohol unevaporated.—T. D. Luke.

Renal activity affected by *chloroform anæsthesia.* Quantity of urine with light anæsthesia increased, with full anæsthesia decreased. Nitrogen output reduced. The urine is more dilute during the anæsthesia, chlorides much increased, albumen appears in some instances, reducing substances other than glucose increased. Experiments on dogs.—B.M.J. i/06 608.

During full *narcosis with A.C.E.* the outflow of urine is diminished, but to a less degree than with chloroform or ether. The excretion of nitrogen is less depressed than the volume of urine. Effect on concentration of the urine is variable. Chlorides increased to a less degree than with chloroform, but to greater degree than in the case of ether.

Full narcosis with C.E. causes urine to be diminished less than with ether. In nitrogen excretion resembles effect of ether rather than that of either chloroform or A.C.E. The urine is more concentrated than the normal. Chlorides are affected as with ether *q.v.*

Inhaler, simple and inexpensive for administering A.C.E. and C.E.—will not get out of order.—B.M.J. i/05,24.

New chloroform and ether regulating inhaler.—L. ii/05,296.

Drop bottle for chloroform—ether mixture.—L. ii/05,297.

Tongue clip for use in anæsthesia.—L. ii/05,606.

Chloræthoform.—Suggested addition of 0·25 per cent. Ethyl Chloride to Chloroform, said to induce and maintain anæsthesia safely.—C.D. ii./04,611.

General Preparations of Chloroform.

Internally Chloroform is an antispasmodic and sedative. On account of its agreeable taste it is often added to nauseous medicines, in the form of Spirit of

Chloroform, to disguise their taste, and to prevent decomposition.—P.J. 1887,315. Externally it produces a local anæsthesia and is added to liniments to aid their absorption and to allay pain in neuralgia. Large doses of chloroform may be taken into the stomach, without causing death. For recovery after drinking an ounce, *see* Ed. M.J. Dec. 1887, 523; a tablespoonful not dangerous. —B.M.J. i./86,786; Th. Gaz. 1886,20. *See also p.* 234.

Washing the hands with chloroform is useful to remove the smell of post-mortem work from them.

Aqua Chloroformi (*Off.*).—1 in 400 of water.

Dose.—½ to 2 ounces (15 to 60 Cc.).

Salts, like sodium sulphate, are apt to cause deposition of chloroform from aqueous solution.

Aqua Chloroformiata, P. Austr. 1 in 100.

Chloroformum Camphoratum, B.P.C.

Camphor 2, Chloroform 1.

Useful for toothache, applied on cotton wool.

Chloroformum Mastiches.

Mastiche 1, Chloroform *q.s.* to 2.

Linimentum Chloroformi (*Off.*).

Chloroform 1, Liniment of Camphor 1.

Vaseline might with advantage replace the oil of the camphor liniment for this preparation.

U S. orders Chloroform 3, Soap Liniment 7.

Oleum Chloroformii, P.G. iv.

Chloroform 1, Olive Oil 1.

Liquor Chloromorphiæ, Chloromorphia Solution. (*Miscible.*)

		Contains in a 10 minim dose :—
Chloroform	150	1½ minims.
Glycerin	400	4 minims.
Liquid Extract of Liquorice ...	100	1 minim.
Morphine Hydrochloride ...	10	$\frac{1}{11}$ grain.
Solution of Atropine Sulphate	20	$\frac{1}{5}$ minim.
Oil of Peppermint ...	2	$\frac{1}{50}$ minim.
Alcohol (90 %) *q.s.* to ...	1000	

Dissolve the Morphine Hydrochloride in the Liquid Extract of Liquorice, Glycerin and Atropine Solution previously mixed; in part of the Alcohol dissolve the Chloroform and Oil of Peppermint; mix with the morphine solution, and add Alcohol *q.s.* to 1,000.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.). Is a homogeneous mixture, and useful sedative, more nearly resembling the secret remedy, Chlorodyne, in active constituents, than the official Tinctura Chloroformi et Morphinæ Composita.

Capsules (gelatin) containing 5 minims for use of travellers are convenient.

Tinctura Chloroformi et Morphinæ Composita (*Off.*). *Dose.*—5 to 15 minims (0·3 to 0·9 Cc.).

		Contains in a 10 minim dose:—
Chloroform	75	$\frac{3}{4}$ minim.
Morphine Hydrochloride ...	10	$\frac{1}{11}$ grain.
Diluted Hydrocyanic Acid ...	50	$\frac{1}{2}$ minim.
Tincture of Capsicum	25	$\frac{1}{4}$ minim.
Tincture of Indian Hemp ...	100	1 minim.
Oil of Peppermint	1·5	$\frac{1}{66}$ minim.
Glycerin	250	$1\frac{1}{4}$ minims.
Alcohol (90%) *q.s.* to	1000	

Mix. Contains about four times the proportion of morphine present in the preparation of B.P. 1885.

Hydrocyanic acid is not now a component of chlorodyne.—P.J. 1892,490.

Poisoning by 4 ounces of Chlorodyne, with recovery by use of atropine, strychnine, and stimulants.—L. ii./90,670. Another case.—L. ii./96,1456; i./98,1686.

Perles of Chloroform contain about 3 minims (0·18 Cc.). in each. *Dose.*—1 or 2.

Spiritus Chloroformi (*Off.*).—*Syn.* Chloric Ether. 1 in 20 of alcohol (90%). U.S. has 3 in 50.

Dose.—30 to 40 minims (1·8 to 2·4 Cc.), or 5 to 10 minims (0·3 to 1·2 Cc.) repeated.

Emulsio Chloroformi, St. Th. H. U.C.H.

Chloroform 8, Tincture of Quillaia 3 (or Tincture of Benega 1), water to 160. Shake to emulsify. Is used instead of the Spirit of Chloroform, 10 to 15 minims the ounce to preserve mixtures containing vegetable infusions and the like.

U.S. prepares with chloroform 4, tragacanth 1 (shaken in dry bottle). Add water 25, shake vigorously. Then almond oil 6, in several portions with shaking. Finally water to 100.

Tinctura Chloroformi Composita, B.P.C. (B.P. 1885). Chloroform 2, Alcohol 90% 8, Compound Tincture of Cardamoms 10. *Dose.*—5 to 60 minims (0·3 to 3·5 Cc.).

CHRYSAROBINUM (*Off.*) U.S.

$C_{30}H_{26}O_7 = 494{\cdot}46$ (B.P. and U.S. Wts.) (498.208 I. Wts.). *Syn.* Commonly but erroneously called CHRYSOPHANIC ACID.

Dose.—$\frac{1}{6}$ to $\frac{1}{2}$ grain (0·01 to 0·032 Gm.) or more.

A substance containing a varying proportion of Chrysophanic acid, obtained from Araroba (*q. v.*) by extraction with hot chloroform.

May be converted into Chrysophanic acid $C_{14}H_5(CH_3)(OH)_2.O_2 = 252{\cdot}17$ (204·08 I. Wts.) by oxidation in alkaline solution and subsequent precipitation of the acid $C_{30}H_{26}O_7 + 2O_2 = 2C_{14}H_5(CH_3)(OH)_2.O_2 + 3H_2O$.

A tasteless inodorous crystalline yellow powder. It is contained in rhubarb root (principally as Chrysophanic acid) and dock root. It partially dissolves in potash solution, with brown colour. Ash limit 1%.

Solubility.—In water only slightly; slightly in ether, and partially in petroleum spirit. It may be made into pills with glycerin of tragacanth.

Uses.—Externally as ointment or pigment. Chrysarobin is a powerful stimulant and parasiticide in acne rosacea, psoriasis, lupus, ringworm of the scalp, pityriasis and tinea circinata.

Unguentum Chrysarobini (*Off.*).

Chrysarobin 1, Benzoated Lard 24. Mix, heat to dissolve as much as possible, and stir till cold. Unguentum Chrysarobini, U.S., is 3 in 50 of benzoated lard.

For some forms of eczema and other skin affections a milder ointment should be used, 5 to 10 grains to an ounce. It stains the skin and hair, and a strong ointment after three days' continued use sometimes produces feverishness and irritation. Its stains can be removed by benzol, weak solution of potash or chlorinated lime.

Unguentum Chrysarobini Compositum (Unna and St. J. H. Chrysarobin 5, Salicylic Acid 5, Ichthyol 5, Vaseline 88.

Baculum Chrysarobini, St. M.'s H.

Chrysarobin 3, Wax 2, Lanolin 5.

Psoriasis treated by an ointment of Chrysarobin 5, Salicylic Acid 2½, Birch Tar (Oleum Rusci) 5, Soft Soap 6½, Vaseline 6½ (Unna).—Glasgow Med. Jl., Dec. 05,465.

Pigmentum Chrysarobini.—*Adopted by G. H.*

Chrysarobin 1; Gutta Percha Solution (B.P. 1885), 9.

Traumaticin, adopted by P. Belg., composed of Gutta Percha (purified) 1, Chloroform (by weight) 9, is also used for making the above pigment. An application more cleanly than liniments or ointments.

Pigmentum Chrysarobini et Pyrogallol.

Chrysarobin 1, Pyrogallol 1, Ether and Alcohol, of each 10; Collodion 120. Apply after bathing every third day. In the form of a paint is recommended for psoriasis; and for ringworm.—B.M.J.E. i./04,16.

Chrysarobin may also be applied with Camphoid, *q.v.*

Araroba. *Syn.* **Goa Powder** (*Off.*). **Crude Chrysarobin. Araroba Depurata,** P. Austr. =Chrysarobinum.

A brownish concretion from the cavities in the trunk of *Andira araroba* (*Leguminosæ*), dried and powdered. Crude Araroba is imported from Brazil; not less than 50% of its weight is chrysarobin, or chrysophanic acid so-called. The Indian mode of using the drug was to cut a lime fruit, dip it in the powder and dab it on the affected skin. The Brazilians mix it with vinegar.

Unguentum Araroba.

Goa Powder 1, Glacial Acetic Acid 1; rub together and add Lard 14. This is an effective application for use in scaly skin diseases.

Eurobin, Chrysarobin-Acetate. A brownish powder recommended as a substitute for chrysarobin. Solutions of 2 to 3% are said to be effective and free from toxic effects, non-irritant, and do not stain.

Lenirobin is **Chrysarobin-triacetate.**

CIMICIFUGÆ RHIZOMA (*Off.*), U.S.

Dose.—15 grains (1 Gm.).

The rhizome and rootlets of *Cimicifuga racemosa*, *Actæa racemosa* (Linn.), black snakeroot or black cohosh. Indigenous to the United States and Canada.

Cimicifugin.

The powdered resinoid substance of a yellowish brown colour obtained from black snakeroot.

Dose.—1 to 6 grains (0·065 to 0·4 Gm.) in pill, as a tonic and antispasmodic, given for rheumatism, chorea, amenorrhœa, and to excite contraction of the uterus.

Extractum Cimicifugæ Liquidum (*Off.*).

1 = 1 of Cimicifuga exhausted with 90% alcohol.

Dose.—5 to 30 minims (0·3 to 1·8 Cc.).

U.S. has also (powdered) extract (*Dose* 4 grains), made by concentrating the fluidextract, powdering, and adding powdered glycyrrhiza, so that 1 of extract = 4 of drug.

Tinctura Cimicifugæ (*Off.*).

Syn. TINCTURA ACTÆA. 1 in 10 of 60% alcohol.

U.S. 1 in 5 alcohol (94·9% vol.).

Dose.—30 to 60 minims (1·8 to 3·5 Cc.), or 5 minims every hour.

Very useful in chronic rheumatism where one part of a tendon, muscle, or articulation is exquisitely painful, or where the disease is traceable to previous affection; also in lumbago, sciatica, and pleurodynia.

Fluidextractum Cimicifugæ, U.S. 1 = 1.

Average Dose.—15 minims (1 Cc.).

CINCHONÆ CORTEX.

(*Rubiaceæ.*)

The principal dried barks used for the production of the salts of the Cinchona alkaloids are:—Red Cinchona bark, from *Cinchona succirubra;* Yellow Cinchona bark, obtained from *Cinchona Calisaya;* pale Cinchona bark (crown or Loxa bark), from *Cinchona officinalis*; the bark of *Cinchona lancifolia*, Mutis, and other species of Cinchona; that of certain species of Remijia may also be used. The only kind official for making galenical preparations is the cultivated Red Cinchona, *v.p.*241.

Cinchona, U.S., is from various species. 5% total alkaloids; 4% ether-soluble. *C. rubra* is separately official.

The Quinine barks, as they are called, now imported from South America, are chiefly the Calisaya in quills; those known as Cuprea barks, the produce of species of Remijia, are rarely now imported. A much larger quantity of cultivated bark, the produce of

C. succirubra, *C. officinalis*, and hybrids, arrives from Madras and other parts of India; most of the rich Java bark, produced by *C. Calisaya, var. Ledgeriana*, now goes direct to Amsterdam or Hamburg. The old natural "flat" Calisaya bark is not now met with, but a kind of yellow bark, pressed into flat pieces, is imported from Bolivia to replace it. The flatness is produced by tight packing in serons bound with green hide thongs which, contracting, keep it flat.

The cultivation of the Cinchonas is carried on in India, in the Nilgiri Hills in the south, and near Darjeeling in the north-east, also in Ceylon, Java, and Jamaica.

The species *C. succirubra* has proved to be the hardiest and most easily propagated, and, although on analysis the yield of cinchonidine and quinidine generally preponderates over that of quinine, yet the total yield—often 5 to 10%—of alkaloids from the bark of this Cinchona is very large (especially in the hybrids with *C. officinalis*); latterly the proportion of quinine in it has increased.

By far the largest proportion of the barks worked for quinine is Java *Ledgeriana* bark, all derived from one packet of seed obtained from one great tree by the Indian Manuel, and brought over by Ledger, which cost the Dutch Government £50 and Manuel his life. Of this bark Java produces nine to ten millions of pounds per annum, average test 5% of sulphate of quinine, exceptional samples testing 10 to 12%. Much smaller quantities of *Calisaya* from South America, *officinalis* from India and Ceylon, and *Succirubra* from India, Ceylon and Java, are also used, the latter being sought after by manufacturers of Pharmacopœa Germanica II Quinine, which allows 10% or thereabout of Cinchonidine (Howard).

Cinchonæ Rubræ Cortex, Red Cinchona Bark. (*Off.*). *Dose.*—5 to 60 grains (0·32 to 4 Gm.). The dried bark of the stem and branches of cultivated plants of *Cinchona succirubra*. Tested by official process, it should yield between 5 and 6% of total alkaloids, of which not less than one-half should consist of quinine and cinchonidine.

Assay method improved upon (Gadd, P.J. ii./05, 579).

Ammonium Zinc thiocyanate precipitation forms a method of volumetrical estimation of quinine in commercial drugs.—Proc. Chem. Soc., 1905,242.

Preparations of Red Bark.

Decoctum Cinchonæ. B.P. 1885.—1 produced 16.

Dose.—1 to 2 ounces (30 to 60 Cc.).

Elixir Cinchonæ.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Liquid Extract of Cinchona 1, Simple Elixir 7. Mix.

Extractum Chinæ. P. Austr.

Dose.—1 to 4 grains (0·065 to 0·26 Gm.).

A cold water percolate, inspissated.

Ph. Ned.—Hydro-alcohol 15 to 18% alkaloids.

P. Belg. contains 10% alkaloids, of which 2% is Quinine.

Extractum Cinchonæ Liquidum (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

This contains 5% (Ph. Ned. has 5 to 6%) of total alkaloids, and is an acid preparation; 1 equals about 1 of bark. In the 1867 B.P. **Extractum Cinchonæ Flavæ Liquidum** yellow bark was percolated with cold distilled water *only*, the percolate concentrated to Sp. Gr. 1·2, and one-third its volume of rectified spirit added; it then had Sp. Gr. 1·1; this menstruum failed to exhaust the bark—even approximately.

If prescribed with acid, as in the following:—Spirit of Chloroform 1½ drachms, Nitro-hydrochloric Acid 1½ drachms, Liquid Extract of Cinchona 1½ drachms, Water to 6 ounces, mix the first three ingredients in order written, and pour into the water to produce best result.

Liquid extract of red bark has been much lauded in America for giving drunkards a distaste for alcohol.

Methods of assaying Cinchona Bark and Extracts.—P.J. i./03,268; Y.B.P., 1902,55,56.

A modified official assay process which is claimed to give good results. Use alcoholic potash solution in place of aqueous.—P.J. ii./01,90; P.J. ii./05,124.

Various methods of making Liquid Extracts of Cinchona discussed: that of Wobbe having advantage of small quantity of liquor and rapid percolation; the extract does not deposit.—P.J. ii./04,324.

Fluidextractum Cinchonæ, U.S. *Dose.*—15 minims.

U.S. Standard 4·0 Gm. anhydrous ether-soluble alkaloids in 100 Cc.

Extractum Chinæ Fluidum. P. Austr. 4

alkaloids; P. Belg. (glycero-hydro-alcoholic) 5%, of which 1% is quinine. A fluid extract with Potassium Iodide 3% is also in P. Belg.

Infusum Cinchonæ Acidum (*Off.*).

Dose.—½ to 1 ounce (15 to 30 Cc.).

Red Bark in No. 40 Powder 1, in boiling distilled Water 20, with Aromatic Sulphuric Acid ¼; infuse one hour and strain.

Mistura Ferri Aromatica, B.P. 1885. *Syn.* **Heberden's Ink.** *Dose*, 1 to 2 ounces (30 to 60 Cc.).

Red Cinchona Bark 4, Calumba Root 2, Cloves 1, Iron Wire 2 Peppermint Water 48. Macerate 3 days, filter and add Peppermint Water, *q.s.* to 50. Then add Compound Tincture of Cardamoms 12, Tincture of Orange Peel (dried) 2,

Tinctura Cinchonæ (*Off.*).

About 1 in 5 of 70% alcohol; standardised to contain about 1% of alkaloids.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Tinctura Chinæ, Ph. Ned. is same strength but not standardised.

U.S. Cinchona 40, Glycerin 15, Alcohol and Water in proportion of 675 and 250, *q.s.*, to 200.

Assayed to 0·75% ether-soluble alkaloids.

Mistura Antidipsomania. N.H.W.

Tincture of Cinchona 1 drachm, Glycerin ½ drachm, Tincture of Capsicum 3 minims, Decoction of Cinchona to ½ ounce.

Tinctura Cinchonæ Composita (*Off.*).

Syn. HUXHAM'S TINCTURE OF BARK. About 1 in 10 of 70% alcohol. *Dose*, ½ to 1 drachm (1·8 to 3·5 Cc.).

U.S. Red Cinchona 50, Bitter Orange Peel 16, Serpentaria 4, Glycerin 15, Alcohol (94·9% vol.) and water in proportion of 675 and 250 of each, *q.s.*, to 200.

Tinctura Chinæ Composita Whytii, Ph. Ned. Cinchona 20, Orange Peel 20, Gentian 20, Alcohol 70% 300.

Vin de Quinquina au Malaga (Codex).

May be made with red bark 3 parts in 100 of Malaga wine.

Dose.—1 to 4 drachms (3·5 to 15 Cc.) for children.

Vinum Chinæ, P.G. iv. *Dose.*—1 to 4 drachms.

Red Bark 1 in 25 of Sherry detannated by Gelatin and flavoured with Sugar and Tincture of Orange.

P. Austr. has—dissolve Gelatin 1, in hot water 20, and

add Malaga 780. Allow to stand 24 hours and add Fluid-extract of Cinchona and Tincture of Orange of each 50, and Honey 100.

Vinum Chinæ Ferratum, P. Austr.

Dissolve Gelatin 1 in Water 20, add to Malaga Wine 955; after 24 hours add Iron and Quinine Citrate 5 dissolved in Water 20. Set aside 14 days, filter and preserve in wine bottles kept from the light.

CINCHONIDINÆ SULPHAS.

$(C_{19}H_{22}N_2O)_2H_2SO_4, 3H_2O = 735{\cdot}08$ (735·05 U.S., 740·636 I. Wts.). (From alcohol crystallises with $2H_2O$.)

Dose.—1 to 10 grains (0·065 to 0·65 Gm.).

In silky white needles, generally smaller than quinine sulphate, obtained from some cinchona barks. Although isomeric with cinchonine, its solution is lævogyrate, like that of quinine, but it does not produce the emerald green colour with chlorine water and ammonia. ***Soluble*** 1 in 60 of alcohol, 1 in 100 of water, rendered more soluble in water by addition of acid—a minim or more of diluted sulphuric acid to a grain—may be dispensed thus, or 5 parts with 1 of glycerin of tragacanth in pills. Taste bitter.

In intermittent fevers, malaria, and neuralgia, Cinchonidine has a distinct value of its own.

Cinchonidine Salicylate, $C_{19}H_{22}N_2O,C_6H_4OH.COOH = 429{\cdot}06$ (432·304 I. Wts.) is useful as a tonic and antiperiodic in neuralgia, rheumatism, sciatica, &c., 5 grains every 2 hours in pills or cachets.

CINCHONINA.

$C_{19}H_{22}N_2O = 292{\cdot}05$ (294·256 I. Wts.).

Dose.—1 to 10 grains (0·065 to 0·65 Gm.).

An insoluble white powder, as met with in commerce, obtained from Cinchona barks, isomeric with cinchonidine, but solutions of its salts are dextrogyrate. It is recommended as a tasteless febrifuge for children.

Cinchonine salts are much the cheapest of the alkaloidal salts of Cinchona. Their nauseous, bitter taste is objectionable, as prophylactics some have thought them superior to quinine.

Cinchoninæ Hydrochloridum.

$C_{19}H_{22}N_2O.HCl,2H_2O$=364·0 (366·746 I. Wts.).

Dose.—1½ to 10 grains (0·1 to 0·65 Gm.), or more.

In white acicular crystals, soluble 1 in 30 water and 1 in 2 of alcohol 85 %. (Commercial samples we find vary.)

Cinchoninæ Sulphas, U.S.

$(C_{19}H_{22}N_2O)_2H_2SO_4,2H_2O$ = 717·2 B.P. (717·17 U.S.); 722·62 I. Wts.).

Dose.—1½ to 10 grains (0·1 to 0·65 Gm.), or more.

In hard, colourless, short rhombic prisms, with a vitreous lustre. Soluble 1 in 70 of cold water, 1 in 10 alcohol 90%.

Cinchoninæ Iodosulphas. *Syn.* ANTISEPTOL.

This odourless brown powder has been used as a substitute for iodoform. Contains 50 % of iodine, and is soluble in alcohol and chloroform, insoluble in water.

Cinchoninæ Sulphocarbolas.

$C_{19}H_{22}N_2O.C_6H_4.SO_3H.OH$ (?) = 464·85 (468·364 I. Wts.). In reddish white needles. **Cinchonine Sulphocresotate** (amorphous) and **Acid Hydrochloride**, $C_{19}H_{22}N_2O.2HCl$=364·43 (367·172 I. Wts.), are new salts with antiseptic properties. — Y.B.P., 1902,57.

Cinchoninæ Tannas.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

A yellow powder, very slightly soluble in water.

Cinchoninæ Tartras. Tonic Astringent.

$(C_{19}H_{22}N_2O)_2C_2H_2(OH)_2(COOH)_2$, $2H_2O$ = 768·78 (774·592 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

In crystalline condition, soluble 1 in 33 of water.

CINNAMOMI CORTEX (*Off.*).

The dried bark from *C. zeylanicum* (*Lauraceæ*).

Dose.—10 to 30 grains (0·65 to 2·0 Gm.).

Aromatic, carminative and antiseptic, employed as flavouring agent. Contains volatile oil and tannin. Official are, Compound Powder (1 in 3), Water (1 in 10), Spirit (1 of oil in 10), and

Tinctura Cinnamomi. *Dose.*—½ to 1 drachm.

1 in 5 alcohol 70%. **U.S.** has Saigon Cinnamon 40, Glycerin 15, Alcohol (94·9% vol.), and water in proportion of 675 and 250 to 200.

Oleum Cinnamomi (*Off.*) *Syn.* OLEUM CASSIÆ. U.S.

Dose.—½ to 3 minims (0·03 to 0·18 Cc.).

U.S. requires 75% Cinnamic Aldehyde by volume, Sp. Gr. 1·045 to 1·055 at 20° C.

The light yellow oil distilled from the bark has taste and properties representing it. The Chinese oil, as distinguished from that made in Ceylon, is known as Cassia Oil.

Aqua Cinnamomi Concentrata may be made with Quillaia Tincture as Aqua Menthæ Piperitæ Concentrata (*q.v.*). *See also* Ph. Form *pp.* 554-557.

Soluble in alcohol 90% about 10 in 3.

Is occasionally prescribed as an inhalation (30 to 40 minims) with boiling water 1 pint.

Cinnamon oil has a reputation as a remedy against influenza and common colds, 20 drops being taken in a wine glassful of water or on sugar. Placed in a carious tooth relieves the pain.

Capsules of Cinnamon Oil, 2½ minims with quinine sulphate 1 grain, increased to 5 minims of the oil. In typhoid.—B.M.J. ii /04,1450.

Cinnaldehydum, U.S. *Vide* Acidum Cinnamicum.

Cinnamon Dental Paste. Iodoform made into a paste with cinnamon oil.

COAL TAR DERIVATIVES.

The Aromatic series of derivatives from coal tar, so freely used as antipyretics and analgesics, produce changes in the blood, diminishing its respiratory capacity and destroying red corpuscles.—L. i./93,377.

They are oxidised in the body to paramidophenol, or an allied substance. Methæmoglobin is formed in proportion to the amount produced.—Dixon.

It is remarkable the position and reputation these bodies have attained; they were practically unknown 25 years ago.—B.M.J., i/05, 5.

Liquor Carbonis Detergens.

This alcoholic preparation owes its properties in part to Phenol. Is used as a Lotion, from 1 drachm to 1 ounce to a pint of distilled water forms a yellowish milky emulsion; or, as an Ointment, Liquor Carbonis Detergens 1, Unguentum Hydrargyri Nitratis 3, Unguentum Simplex 4. In prurigo and chronic scaly skin diseases.

The following will also be found useful in eczema,

Liquor Carbonis Detergens 2, Liquor Plumbi Subacetatis 2, Zinci Oxidum 4, Glycerinum 4, Aqua 36.

Balneum Picis Carbonis. St. John's Hosp.
Solution of Coal Tar 8 ounces, water 95° F. 30 gallons.

St. M's H. has Tar 3, Methylated Spirit 2, Ether 1. This lotion to be painted over the patient and allowed to dry, then followed with hot bath.

Lotio Plumbi Detergens, V.C.H.
Liquor Carbonis Detergens 1, Liquor Plumbi Subacetatis Fortior 2½. One teaspoonful to a pint of water.

Unguentum Picis et Acidi Salicylici, V.C.H.
Liquor Carbonis Detergens 30 minims, Salicylic Acid 15 grains, Ammoniated Mercury 5 grains, Soft Paraffin to 1 ounce.

Liquor Picis Carbonis (*Off.*).
Prepared Coal Tar (*Pix Carbonis Præparata* (*Off.*).—Coal Tar (prepared by heating in a shallow vessel, at 120° F. for one hour, stirring frequently), 1, Tincture of Quillaia (1 in 10 of 90% alcohol) 5. Digest at 120° F. for two days, cool, and decant or filter.

Lotio Picis Carbonis Alkalina. St. Th. H.
Liquor Picis Carbonis 1 drachm with Sodium Bicarbonate 120 grains in water to 1 pint.

Lotio Picis Carbonis Aromatica, St. M.'s. H.
Prepared Coal Tar 3 ounces, Ether 2 ounces, Methylated Spirit 1 ounce. Dissolve, filter and add Peruvian Balsam 6 drachms, Salicylic Acid 1½ drachms.

Liquor Picis Carbonis et Ligni.
Dissolve Wood Tar 1 in 20 of official liquor above.

Liquor Picis Ligni may be prepared by dissolving Wood Tar 1 in 20 of Tincture of Quillaia (above).

The tincture of quillaia enables these solutions to form emulsions with water. One part to 7—20 is useful for various skin affections as a lotion.

Aqua Picis, Ph. Ned., 5% by mixing with Pumice.

Anthrasol. A distillate from Coal Tar of the consistence and colour of Olive Oil. In skin affections.
Does not stain linen or skin, 20% in soft paraffin for pruritus or 10% with a glycerin starch base.—B.M.J.1/05,310.

Creolin Pearson.
A dark-coloured liquid antiseptic, said to contain 20% of Cresylic Acid, with neutral Hydrocarbon Oil and Resin Soap.

Cyllin Medical. *Dose.*—1 to 5 minims (0·065 to 0·32 Cc.).

Is a dark alkaline liquid prepared from coal tar, and contains 60% of certain members of a new series of oxidised hydrocarbon, having a diphenyl nucleus in place of the single phenyl found in carbolic acid; it is neither caustic nor toxic, forming a white emulsion with water, and is recommended as a deodorising bactericide. Its carbolic acid co-efficients range from 17·0 for *B. typhosus* to 34·0 for *B. pestis.*—L. ii./04,416.

For lotions 1 to 200; as a douche 1 to 400. Cyllin is stated by the manufacturers not to be a poison under the Pharmacy Act, 1868. Sprue treated by doses of 3 minims every 2 hours.—Jl. Trop. Med., March, 1905.

As ointment for erysipelas, eczema, and scabies. May contain 5% with Adeps Lanæ.

Lotio Creolin—St. Th. H. Cyllin 1, Glycerin 8, water to 160. St. J. H. 1 in 320 without glycerin, 1 to 2 drachms in a pint of water.

Cyllin Capsules—1 and 3 minims keratin coated, are supplied, and have been used in summer diarrhœa, dysentery, colitis and sprue.

Cyllin Dusting Powder—Substitute for iodoform. **Gauze**—10%. 1, 5 and 20 yard rolls. **Inhalant**—Antiseptic. For use in phthisis with an air inhaler. **Pastils**—contain 1/10 minim in each.—L. ii./05,1339. **Plaster**—5%. **Rectones**—(Suppositories). **Cyllin Soft Soap**—Contains 5% Cyllin; **Surgical Soap**—10%.

Lano-Cyllin—for disinfection of skin after scarlet fever and similar diseases.

Cyllin Liquid Soap—Equals in activity 50% carbolic acid.

Unguentum (Creolin) Cyllin Compositum—St. J.H., Cyllin ½ drachm, Soft Soap 1 drachm, Ammoniated Mercury Ointment ½ ounce, Soft Paraffin 1 ounce.

Unguentum (Creolin) Cyllin Cum Acido Salicyllco—St. J.H. Cyllin 1 drachm, Salicylic Acid 1 drachm, Soft Paraffin to 1 ounce.

Experiments with Cyllin in comparison with phenol on cultures of cholera and dysentery organisms proved the former to have a carbolic acid equivalent 32 in case of cholera, and 10 in case of *B. dysenteriæ, Flexner.*—L. i./05,1714. Cyllin in tuberculosis.—L. i./05,377. Comparisons with carbolic acid for fæces and urine respectively.—L. i./96,94.

Jeyes Fluid Disinfectant to be distinguished from Cyllin (medical). Is a liquid containing 20% of cresols, saponified with resin soap. Dilute solutions (1% and 2% strength) are employed as antiseptic lotion, and injection 1 in 400 is said to be of value in gonorrhœa, also in ozœna.

Izal (Medical). A proprietary name.

A white emulsion of oxidized hydrocarbons, obtained from coal oil, containing 40% of Izal oil; used as a non-poisonous disinfectant and antiseptic. May be used 1 in 200 of water. It is destructive to *B. coli* and other organisms. This and **Capsules** 2 to 10 minims with Cod Liver Oil 5 minims are an effective and cheap remedy in phthisis.—L. i./02,146.

Capsules of **Izal** (plain) 2 minims and **Izal** 2 minims **with Cod Liver Oil** 5 minims are supplied.

Doses of 3 minims, in conjunction with Bismuth Subnitrate and Chloromorphia Solution, have given good results in dysentery.

Ringworm treated by inunction.—B.M.J. ii./04, 1520.

Izal Fluid, containing the same amount of impure Izal Oil, is also supplied.

Kelvolin.

A dark-coloured, oily fluid, with slight tar-like odour. Contains 40% of the homologues of Phenol, and contains no free alkali. Has strong germicidal properties, even when considerably diluted. Applied to the skin it has a marked penetrative power, and a softening action on incrustations. On cotton wool, and vaporised in the treatment of sepsis of the middle ear.—L. i./04,369.

Empyroform. A dry tar-formaldehyde compound, soluble in acetone, chloroform and alcohol. For psoriasis, prurigo, pityriasis and seborrhœa.—B.M.J.E. ii./05,27. In ointment form 5 to 20%.

Liquor Cresoli Saponatus, P.G. iv.

Equal parts of crude cresol and potash soap, *c.f. p.* 17.

Liquor Cresolis Compositus, U.S. Cresol 500, emulsified with linseed oil 350, and potassium hydroxide 80, in water a sufficiency to make 1000. Requires c re in production. We find it best to first make the soap and then add the cresol little by little to it.—Am.Jl.Ph., Feb. 06,100, recommends adding the soap to the cresol.—*Ibid.*, Mar. 1906, 171, gives further details. **Ph. Ned.** is similar.

Aqua Cresolica. P.G. iv. One part of the P.G. preparation above to 9 of distilled or common water. P. Austr. is 2% Kresol, *v.p.* 17.

Lysol. A dark alkaline liquid, obtained by the saponification of cresols, and containing the higher

homologues of phenol. It is soluble in all proportions of water, forming a gelatinous mixture with small quantities, and is said to be a stronger antimycotic and less poisonous than phenol. Incompatible with acids. A useful disinfectant.—B.M.J.E. i./92,99.

In lupus, applied daily or every other day, useful, but painful.—B.M.J. ii./91,598. One per cent. solution recommended in aural practice and midwifery.—B.M.J.E. i./91,173. For otorrhœa.—B.M.J.E. i./03,44.

Poisoning by.—B.M.J. i./00,1498; B.M.J.E. ii./98, 63; ii./01,73.

Kresophen. A specialty for surgical use which does not discolour or injure instruments.

Acetanilidum, Acetanilide. (*Off.*).—*Syn.* PHENYLACETAMIDE (ANTIFEBRIN) $CH_3CO.NH.C_6H_5$ = 134·10 (135·112 I. Wts.; 134·09 U.S.). **P. Austr.**

Dose.—1 to 3 grains (**0·065 to 0·2 Gm.**) or more (average 4 grains U.S.). P.G., Maxim. dose **0·5 Gm.**; Maximum daily dose **1·5 Gm.** in cachets or suspended in water by compound tragacanth powder.

Prepared by the action of glacial acetic acid on aniline. In small white odourless glittering crystals, which produce a burning sensation on the tongue, and melt at 236·5° F. (113·5°C.).

Soluble 1 in 200 of water, slightly in glycerin, 1 in 4·2 of alcohol 90%, 1 in 20 of brandy with difficulty; also easily in chloroform, benzol and ether.

Uses.—As a febrifuge and antipyretic, hypnotic, sedative, anti-epileptic, anti-arthritic, and nervine tonic.

Tablets, 3 grains. *Dose.*—1 or more.

Tablets of Acetanilide, 3 grains **with Caffeine** 1 grain are useful in migraine.

Effervescent Acetanilide. *Dose.*—1 drachm.

This is prepared in two strengths, 1 and 3 grains in 1 drachm.

Checks the chills and fever of phthisis, quiets the nervous system, and is useful in typhoid.

Relieves sciatica and the darting pains of locomotor ataxy.

Death following use of headache powders, found to contain 4 to 10 grains acetanilide in each.—P.J. ii./96,14; B.M.J. i./98,1539. Risks of such headache powders discussion.—B.M.J. ii./98,434,987.

Pulvis Acetanilidi Compositus, U.S., B.P.C.

Dose.—3 to 5 grains.

Acetanilide 7, Caffeine 1, Sodium Bicarbonate 2. Its action resembles 'Daisy' powders.

Ammonol (designated also 'Ammonium-Phenyl-Acetamide'). Relieves dysmennorrhœa.

Dose.—5 to 20 (?) grains (0·32 to 1·3 Gm.).

A white powder, imperfectly soluble in water, contains acetanilide, sodium bicarbonate and ammonium carbonate. Also supplied in **Tablets** of 5 grains.

Ammonol Salicylate is a white powder soluble in water about 1 in 50.

Antinervin. Reported to be salicylic acid, potassium bromide, and acetanilide.—P.J. 1891,1169.

Maretin. *Syn.* CARBAMIC ACID-TOLYL-HYDRACID.

Dose.—3 to 10 grains (0·2 to 0·6 Gm.).

A white insoluble crystalline substance, melting at 183° C., given as a febrifuge. In phthisis, headache, and neuralgia.—B.M.J.E. ii./04,4; ii./04,1414; i./05 80. Especially for rheumatism.—B.M.J.E. ii./05,68. Lowers temperature gradually. Not detrimental to the appetite, given in headache; 10 grain doses have been given for the pain of tabes dorsalis.

Monobromacetanilide. *Syn.* MONOBROMPHENYL-ACETAMIDE; ANTISEPSIN. $CH_3CO.NH.C_6H_4Br.1:4 = 212·45$ (214·064 I. Wts.) A bromine substitution compound of acetanilide, in white acicular tasteless crystals. Suggested for facial neuralgia, neuritis, and rheumatism, in dose of 3 to 15 grains (0·2 to 1 Gm.).

Two cases of cyanosis from its use.—B.M.J. i./90,357. In small doses may reduce temperature of phthisis.

Phenalgin. Said to be 'Phospho-ammonio-phenyl-acetamide.' *Dose.*—5 to 20 grains (0·3 to 1·3 Gm.).

A mixture with antifebrin as the active base.

A white powder soluble in water about 1 in 120 with some residue, and partially soluble in alcohol 90%; as a substitute for opium, and as an antipyretic; has antimalarial and hypnotic properties.—P.J. i./99,449.

Tablets and Gelatin (Hard) Capsules, 2½ grains.

Acetophenone. *Syn.* HYPNONE; PHENYL-METHYL ACETONE. $C_6H_5.CO.CH_3 = 119·16$ (120·064 I.Wts.).

Dose.—1½ to 5 minims (0·1 to 0·3 Cc.) suspended in

almond emulsion, or with mucilage or syrup and peppermint water, or in **Capsules of Hypnone** with oil, which contain ¾ minim. Hypnone is a colourless liquid, but crystallizes below 50° F. in white needles. Has a strong odour of Bitter Almonds. Is insoluble in water, but soluble in alcohol, ether, oils, and in glycerin to extent of about 1 in 100. As an hypnotic is somewhat uncertain, its administration requires care.

Anilin. *Syn.* MONO-PHENYLAMINE, ANILIN OIL. $C_6H_5NH_2$=92·4 (93·096 I. Wts.).

An almost colourless (when freshly prepared), mobile, oily liquid, with a faint vinous odour and aromatic burning taste, soluble in alcohol, ether, and oils, slightly n water. It darkens in colour by keeping (*v.p.* 881).

Antidotes.—Fresh air, alkaline salt (NaCl) solution, sodium sulphate.

Anilin-Iodoform.

Dissolve Iodoform 1 in Anilin Oil 10 (by weight).

Anilin-Cocaine.

Dissolve Cocaine (base) 5 in Anilin Oil 100 (weight).

These are employed in aural treatment.

Anilin Sulphate. $(C_6H_5NH_2)_2H_2SO_4$ = 282·14 (284·268 I.Wts.). *Dose.*—½ to 3 grains (0·032 to 0·2 Gm.)

Has been used for emphysema and asthma; must be used cautiously, as it may cause cyanosis.

Acidum Sulphanilicum. $C_6H_4NH_2SO_3H$, $2H_2O$ (1 : 4)=207·62 (209·188 I. Wts.).

Dose.—5 to 10 grains (0·3 to 0·6 Gm.).

In small white crystals, slightly soluble in water. Is used in Ehrlich's Diazo Test, *q.v.*

Has been employed to relieve iodism, catarrh, laryngitis, and otitis. Is analgesic, and is best given as

Sodii Sulphanilas. $C_6H_4NH_2SO_3Na$, $2H_2O$=229·5 (231·23 I.Wts.). *Dose.*—5 to 15 grains (0·32 to 1 Gm.)

In white shining scales, easily soluble in water. Useful in acute catarrh. Said to convert the harmful nitrites in the saliva and nasal mucus into innocuous diazo bodies. —L. i./95,49.

Amygdophenin.

Dose.—8 to 15 grains (0·52 to 1 Gm.) in cachet.

A compound of para-amidophenol $C_6H_4NH_2OH$ 1 : 4= 108·28 (109·096 I. Wts.) and amygdalic acid (mandelic

or phenylglycolic acid) $C_6H_5CH(OH)COOH$=150·92 (152·064 I. Wts.) analogous to phenacetin. Is in small white crystals, slightly soluble in water and alcohol. Useful in rheumatic fever and neuralgia, but of little value as an antipyretic.—B.M.J.E. ii./95,99 ; P.J. i./96,162.

Anthrarobin. $C_6H_4C(OH)CH.C_6H_2(OH)_2$=224·38 (226·08 I. Wts.). A light brownish powder, darkening with age, obtained by reduction from alizarin. It is a powerful deoxidising agent, readily soluble in alcohol or weak alkaline solutions. It has been used with success in psoriasis, in the form of an ointment, containing from 5% to 10%, also for tinea tonsurans or may be applied as a tincture, after rubbing the parts with soft soap or soap liniment.

Acetozone.—Benzoylacetyl-Peroxide.

$C_6H_5CO.O.O.COCH_3$=178·71 (180·064 I. Wts.).

White crystalline powder melting at 98° F. very slightly soluble in water, also in oils and alcohol; is decomposed by alkalis, and it decomposes organic material. Is antiseptic, deodorant, anæsthetic and diuretic.—L. ii./04, 1160. Hydrolyses in presence of water. Should be kept in a dry place. Ointments must be made with mineral materials.

Benzoyl Peroxide, $C_6H_5-CO.O_2.CO.C_6H_5$= 240·26 (242·08 I. Wts.) a crystalline compound, melting at 103·5°, prepared by the interaction of 100 of sodium peroxide and 180 of benzoyl chloride, at a low temperature. Soluble slightly in water, more so in alcohol.—C.D., i./06, 162.

Uses.—For burns and ulcers in the form of a solution in oil (2 to 3%.)

Benzanilide. *Syn.* Phenyl-benzamide.

$C_6H_5NHCOC_6H_5$=195·65 (197·128 I. Wts.).

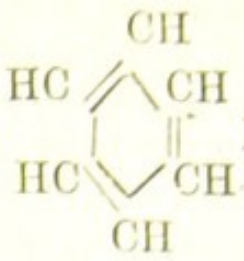
Dose.—3 to 12 grains (0·2 to 0·8 Gm.).

In small white shining scales, odourless and tasteless; insoluble in water, soluble 1 in 60 of alcohol. It is obtained by the action of benzoyl chloride on aniline, being chemically and therapeutically similar to acetanilide. Has been found useful for children as a simple antipyretic.

Neuronal. *Average dose.*—15 grains. *Syn.* Bromomethyl Acetamide. Contains 40% bromine. Sedative and hypnotic in epilepsy.—B.M.J. ii./04,414; B.M.J.E. i./05,28, ii./05,4; P.J. ii./04,868.

Benzol. (*Off.*). *Syn.* BENZENE.

$C_6H_6 = 77{\cdot}46$ (78·048 I. Wts.)



Kekulé.

Dose.—5 to 10 minims (0·3 to 0·6 Cc.), in capsule or oily solution.

A mixture of homologous hydrocarbons obtained from light coal tar oil. Contains about 70% of Benzene and 20% to 30% Toluene. Sp. Gr. 0·880 to 0·888. Crystallizable and purified by sulphuric acid and redistillation.

Uses.—For cough, and whooping-cough, and in influenza. It quickly destroys pediculi capitis or pubis, applied freely; one application generally sufficient.—Also for parasite of itch. For seborrhœa, brushed on the skin.—P.J. i./01,132.

This body is entirely distinct from **Petroleum Benzine** or **Benzoline**, a product distilling over between 60° and 90° C. in the fractionation of the hydrocarbons in Shale (**Benzinum U.S** boils between 45° and 60°). Petroleum Ether (*v.p.* 540) and Benzine are used for heating cauteries for nævi, &c.

A new cautery having the advantage that the airways can be kept clear from soot or from excess of undiluted vapour.—B.M.J. ii./04, 1581.

Benzinum Purificatum, U.S. Benzin purified by potassium permanganate in acid, then in alkaline solution.

Toluol (**Methyl-Benzene**) $C_6H_5CH_3 = 91{\cdot}37$ (92·064 I. Wts.) and **Xylol** (**Dimethyl-Benzene**) $C_6H_4CH_3CH_3 = 105{\cdot}28$ (106·08 I. Wts.) have chemical and physical properties allied to Benzol. The 1 : 2 xylol boils at 141°, 1 : 3 xylol boils at 139°, 1 : 4 xylol boils at 138°.

Chinolinum.

$$C_6H_4 \begin{cases} CH = CH \\ N = CH \end{cases} = 128{\cdot}13 \text{ (129·096 I. Wts.)}$$

Dose.—3 to 10 minims (0·18 to 0·6 Cc.).

A transparent, colourless, strongly-refracting, mobile, oily liquid, with a peculiar odour, soluble in alcohol, but

insoluble in water. May be prepared by the oxidation of nitro-benzene and aniline.

Chinolini Tartras.

$(C_9H_7N)_3,[C_2H_2(OH)_2(COOH)_2]_4$ =980·07 (987·48 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.) in chloroform water, with syrup of orange, or in cachet.

Odourless, glistening, white acicular crystals, nauseous in taste, and soluble about 1 in 40 of water.

Chinoline Salicylate. $C_9H_7N,C_6H_4OH.COOH$= 265·14 (267·144 I. Wts.) is less soluble than the above.

Chinoline tartrate is a powerful germicide and antiseptic. A 1% solution completely destroys the coagulability of blood, it is a powerful antipyretic in enteric and intermittent fevers, useful in neuralgia, and as a local antiseptic.

Chinosol. *Syn.* OXYCHINOLINE POTASSIUM SULPHATE.—$2(C_9H_6NOSO_3K)H_2O$ or $2(C_9H_6NOH)K_2S_2O$ = 540·48 (544·612 I. Wts.). *Dose.*—1 to 5 grains.

The potassium salt of a compound of oxychinoline and sulphuric acid, in yellow, minutely crystalline powder, readily soluble in water; not affected by albumen, but precipitated by alkalis. As a surgical dressing, the alkaline secretions of wounds appear to set free oxychinoline, which acts as an oxidiser and disinfectant. A 2% solution checks surface hemorrhage and for scalds. Cases of phthisis and leprosy have been relieved.

Tablets containing 5, 8 and 15 grains are prepared. One of the latter dissolved in a pint of water is said to be equal to Phenol Solution, 1 in 40, as an antiseptic.

A crude form is prepared for veterinary use.

Gauze, Chinosol, 3% 6 yards pieces.

Exalgin. *Syn.* METHYLACETANILIDE.

$C_6H_5N\ (CH_3)\ CH_3CO$ =148·01 (149·128 I. Wts.).

Dose.—½ to 1 or 2 grains (0·032 to 0·13 Gm.).

In colourless crystals, with a slight saline taste.

Soluble 1 in 60 of water, freely so in alcohol.

Mistura Exalgin.—*Dose* 2 to 4 drachms (7 to 15 Cc.)

Exalgin 1, Tincture of Orange 4, Syrup of Orange-Flower 12, Water to 96.

Pilula Exalgin.—1 and 2 grains in each.

Tabellæ Exalgin.—½ grain (0·032 Gm.) each, with chocolate.

Tablets, compressed, contain ½ and 1 grain (0·032 and 0·064 Gm.).

An analgesic, anti-neuralgic, antipyretic (only in unsafe doses) and antiseptic. In toxic doses causes impulsion, trembling, and paralysis of respiratory organs. Is eliminated by the urine, the quantity of which, and of sugar when present, is reduced. ***Incompatible*** (chemically) with salicylic acid.

Has been used successfully in locomotor ataxy, migraine, neuralgia, chorea, sciatica, and herpes.

In 4-grain doses, of marked benefit in nervous headache, facial and intercostal neuralgia, and lumbago; also in Graves' disease.—L. i./92,1173,1175.

For hypodermic injection; Exalgin 10, Sodium Salicylate 11, Water 100, useful.—P.J. 1894,814.

Eight grains cause fainting and sense of dying, but rapid recovery.—B.M.J. i./98,1518.

Fluoresceïn.—Resorcin-phthalein Anhydride. Tetraoxyphthalophenon Anhydride.

$C_{20}H_{12}O_5 = 329{\cdot}60$ (332·096 I. Wts.).

In yellowish red crystalline powder, sparingly soluble in water, more so in presence of an alkali; showing a most intense green fluorescence.

Alcoholic solution, a useful indicator in acidimetry, especially for ammonia.—P.J. i./01,424.

Liquor Fluoresceinæ, R.O.H. Fluoresceïn 2 and Sodium Bicarbonate 3 in 100. Useful to diagnose corneal lesions. The normal cornea is not stained, but ulcers and parts denuded of epithelium take a green colour, which persists for 2 or 3 hours. Loss of substance in conjunctiva is denoted by a yellow coloration.—L. i./91,447.

'**Sterules**' of the solution are cleanly in use.

Sodium-Fluorescein.—*Syn.* URANIN. $C_{20}H_{10}O_5Na_2 = 373{\cdot}36$ (376·18 I. Wts.). A brownish-yellow powder, soluble in water, with green fluorescence. **Tablets** contain $\frac{1}{250}$ grain (0·00025 Gm.) for the diagnosis of corneal ulcers.—B.M.J. ii./98,489.

Fuchsine.—Rosaniline Mono-Hydrochloride (principally) $\begin{matrix} H_2N.C_6H_4 \\ H_2N.C_6H_4 \end{matrix}\!\!>\!C\!<\!\underline{C_7H_6}\!>\!NH.HCl = 335{\cdot}21$ (337·730 I. Wts.). *Syn.* MAGENTA; ROSEINE.

Dose.—½ to 4 grains (0·032 to 0·26 Gm.), in a pill, with glycerin of tragacanth.

Iridescent crystals, forming a deep-red solution. Used for staining *B. tuberculosis*—*Vide* Bacteriological Notes. Given in renal albuminuria. Must be arsenic-free.

Gallanol. $C_6H_2(OH)_3CO[HN.C_6H_5] + 2H_2O =$ 279·05 (281·16 I. Wts.).

A compound of tannin and anilin in small white crystals slightly soluble in water, melting at 205° C. Soluble in alcohol, but not in chloroform. Antiseptic and parasiticide. Used in place of pyrogallol or chrysarobin in psoriasis and eczema as powder or ointment.

Kryofin. $CH_3.OCH_3.CONH.C_6H_4OC_2H_5 = 208·59$ (210·168 I. Wts.). *Dose.*—3 to 8 grains (0·2 to 0·52 Gm.)

A compound of paraphenetidin and methylglycolic acid, in minute, white, shining, granular crystals, odourless, with slight saline taste; soluble about 1 in 800 of water, more so in alcohol. An antipyretic and antineuralgic.

Kryogenin.—*Syn.* META-BENZAMINE-SEMICARBAZIDE. *Dose.*—3 to 24 grains (0·2 to 1·5 Gm.)

A crystalline body soluble about 1 in 100 of water and about 1 in 25 of alcohol 90%. Has antipyretic properties, and has been used in phthisical affections, and in typhoid.—B.M.J.E. i./05,19.

Lactophenin.—*Syn.* LACTYL-PHENETIDIN. $C_6H_4.OC_2H_5.NH.CO.CH(OH)CH_3 = 207·59$ (209·16 Wts.). *Dose.*—5 to 15 grains (0·32 to 1 Gm.).

A compound of lactic acid and phenetidin, in small white crystals, tasteless, soluble 1 in 330 of water. Differs from phenacetin in containing a molecule of lactic acid in place of acetic. Is an analgesic, given with good results in neuralgia, migraine, and articular rheumatism, and as an antipyretic in typhoid, scarlet fever, influenza, and other zymotic diseases.—B.M.J. i./98,1055. Insomnia of insanity, good results.—B.M.J.E. ii./98,12.

Malachite Green.

Chemically a tetra-methyl-diamido-triphenyl carbolic-chloride—though many substances are sold under the name—is a very toxic compound. For trypanosomiasis if injected into the blood it kills the trypanosoma in a matter of 48 hours, but unfortunately the organisms

will recur, as the result is not permanent. Experiments on mice—peritoneal injections, however, more successful. Injections of 1 Cc. of 1 in 2,000 solution in normal saline.—B.M.J. ii./04,1449, 1645 ; M.A., 1906, 32, 510.

Further treatment : Quinine, and arsenic preparations.

Malakine.—*Syn.* SALICYL-PARA-PHENETIDIN.

$C_6H_4 \begin{cases} O.C_2H_5 \\ N=HC.C_6H_4.OH \end{cases}$ =239·35 (241·16 I. Wts.).

Dose.—60 to 90 grains (4 to 6 Gm.) daily, in divided doses, in cachets.

In small light yellow needles, insoluble in water, slightly soluble in alcohol. Useful as an anodyne in neuralgia, headache, and especially in acute rheumatism. As an antipyretic, action is slow and even, and free from after effects.—P.J. 1893, 507; ii./96, 39; B.M.J.E. ii./93,92.—B.M.J. ii./98,1055.

Methylene Blue.—*Syn.* TETRAMETHYLTHIONINE CHLORIDE, METHYLTHIONINÆ HYDROCHLORIDUM.U.S.

$$\left.\begin{array}{l} C_6H_3.N(CH_3)_2 \\ N \quad S \\ C_6H_3.N(CH_3)_2Cl \end{array}\right\} = 317{\cdot}39\ (319{\cdot}774\ \text{I. Wts.}).$$

Dose.—1 to 4 grains (0·065 to 0·26 Gm.); or hypodermically, 1 grain.

Obtained by action of hydrogen sulphide on an oxidation product of para-amido-dimethylaniline. Dull dark green crystals, forming an intense blue solution in water.

N.B.—Commercial methylene blue contains in addition zinc chloride, hence must be carefully distinguished from the medicinal. U.S. provides special tests to distinguish the pure from the commercial.

Cachets containing 1 to 4 grains,

Pills containing ½, 1, and 2 grains, or

Capsules containing 2 grains (0·13 Gm.).

Uses.—Has been recommended as an analgesic, of service in rheumatism, migraine, neuralgia, and painful nervous affections; has also been used in malarial fever, ague, nephritis, and retinitis, with varying results. Colours urine blue, and fæces become blue on exposure to air.

The ulcers in stomatitis can be greatly improved by dusting on or by a solution—the pain is relieved. A weak Eau de Labarraque or Liquor Sodæ Chlorinatæ (*Off.*) is useful to remove the colour in the membrane.

Cystitis, the 2 grain capsules should be given and the bladder washed out with 2% solution.

In dysentery a rectal injection 1 in 5,000. In chronic suppurative otitis media is employed—in 500 solution warm is instilled.—M.A. 1904,28.

In malaria 2 grain doses may be given with powdered nutmeg, and a small quantity of codeine to prevent strangury and nausea.—Pr. lxxviii, 682.

In conjunctivitis 1 in 500 solution.—M.A., 1906,209.

In intertriginous eczemas if the staining is no objection, 3 to 5 % solution is valuable.

In gonorrhœa, Hare suggests capsules containing methylene blue 2 grains, oil of sandal wood 3 minims, oleo-resin of copaiba 3 grains, oil of cinnamon 1 minim.

Methylene Blue Test for the permeability of the kidney. 1 Cc. of 1 in 20 solution is injected into the gluteus maximus and the urine is of pale green colour.

The Phlorizin Test consists in injecting 5 mgr. of phlorizin (*v.p.*745) subcutaneously in 20 to 30 minims of water. Glucose should normally appear in the urine in half-an-hour.—M.A. 1904,461, 462.

Internal use may cause cystitis.—L. i./98,611.

Recommended internally for gonorrhœa.—B.M.J.i./97, 40; P.J.i./97,405. In bilharzial disease.—B.M.J.ii./04, 694. Bilharziosis of the vermiform appendix.—L. /06,672.

Relieves neuralgias, but produces vomiting, diarrhœa, strangury and dyspnœa.—B.M.J. ii./98,1055.

Hysteria improved by pills of; also ozœna and ophthalmia treated by 0·25% solutions.—M. 01,126.

Has proved of value in malaria, and also in bilharzial disease, producing sedative effects. **Chrysoidin** (diamido-azo-benzene hydrochloride) $C_6H_5N_2.C_6H_3(NH_2)_2HCl$=246·87 (248·714 I. Wts.) suggested also for trial where other dyes have failed.—L. i./03,1664.

Dose.—$\frac{1}{5}$ to $\frac{1}{2}$ grain.

Neurodin.—*Syn.* ACETYLPARAOXYPHENYLURETHANE.

$$C_6H_4<\begin{matrix}OC_2H_3O\\NHCOOC_2H_5\end{matrix}$$ =221·47 (223·144 I.Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In colourless, odourless crystals, slightly soluble in water. Recommended as an antipyretic and antineuralgic. B.M.J.E. i./94,12. Feeble, but harmless.—B.M.J. /98,1055.

Orexine Tannate. (Old name, Cedrarine.) The Tannate of Phenyl-dihydro-Quinazoline.

$$C_6H_4\begin{cases} CH_2N.C_6H_5 \\ | \\ N=CH \end{cases} = 206{\cdot}62 \text{ (208·176 I. Wts.).}$$

Dose.—4 to 8 grains (0·26 to 0·52 Gm.) in cachets.

An insoluble greyish-white odourless powder, somewhat soluble in alcohol 90%. Introduced to assist digestion and act as an appetiser. Useful for sea and railway sickness. ***Incompatible*** with iron preparations.

Tablets 4 grains with chocolate are made, also **Pills** 3 grains.

Phenacetinum. (*Off.*) Acetphenetidinum, U.S. $C_2H_5O.C_6H_4.NH\,COCH_3$ 1 : 4 = 177·8 (177·79 U.S. Wts.) (179·144 I. Wts.). P. Austr.

Dose.—5 to 10 grains (0·32 to 0·65 Gm.), in cachets, tablets, or suspended in mucilaginous fluids.

An acetyl compound of Phenetidin, $C_6H_4(NH_2)OC_2H_5$ = 136·1 (137·128 I. Wts.) (the ethylic ether of paramidophenol). It is analogous to acetanilide (antifebrin). White, shining, laminar crystals, M.P. 135° C., B.P. (134-135° C. U.S.), tasteless, ***soluble*** sparingly in water, 1 in 20 of alcohol (90%), in sulphuric acid without colour (B.P. and U.S.).

Cold saturated solution treated with bromine water should not become turbid (absence of acetanilid. B.P. & U.S.) 0.1 Gm. boiled one minute with 3 Cc. of sodium hydroxide solution 1 in 2, and the solution cooled and shaken with 5 Cc. of chlorinated soda solution, a clear yellow liquid is produced (absence of acetanilid, U.S.).

Does not liquefy with sodium salicylate, but phenazone does, *e.g.*, Phenacetin 10 grains, Caffeine Citrate, 2 grains, Sodium Salicylate 5 grains, is not incompatible.

Uses.—Reduces temperature and soothes pain; causes no rash or cyanosis. Successful in rheumatism, neuralgia, migraine, and hysteria. Useful in some cases of pyrexia of phthisis. In first stage of influenza relieves headache and mitigates aching of limbs.

Doses of 4 to 8 grains reduce temperature in case of pyrexia, but effects are only of short duration.

Phenacetin or acetanilide is suitable in yellow fever is constitution is good.—M. Arch., 1905, 390.

Effervescent Phenacetin.

Dose.—1 drachm (4·0 Gm.) or more.

In two strengths, 5 and 10 grains in 1 drachm respectively.

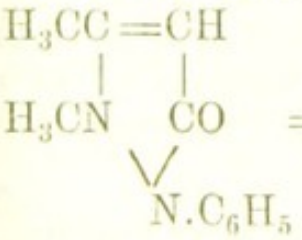
Tablets, 4, 5 and 10 grains. *Dose.*—1 or more.

Tablets of Phenacetin 4 grains (0·26 Gm.), and Caffeine 1 grain (0·065 Gm.), are prepared and are useful in migraine; also Tablets of Phenacetin $2\frac{1}{2}$ grains (0·16 Gm.), with Sulphonal $2\frac{1}{2}$ grains (0·16 Gm.)

Phenacetinum cum Caffeina Effervescens, B.P.C
Dose.—1 to 2 drachms.
Contains 5% Phenacetin and $2\frac{1}{2}$% Caffeine Citrate.

Citrophen. $C_3H_4OH\left(\begin{matrix}CO\,NH\\OC_2\,H_5\end{matrix}\right)>C_6H_4)_3, 3H_2O$= 598·92 (603·448 I. Wts.)
Dose.—3 to 8 grains (0·2 to 0·52 Gm.).
A combination of citric acid with paraphenetidin, in white, minutely crystalline powder, soluble in water (1 in 80), less in alcohol, with a pleasant taste; antipyretic and antineuralgic.—L. i./00,36; B.M.J. ii./98,1056.

Phenazonum. (*Off.*) U.S. *Syns.* ANALGÉSINE, ANTIPYRINUM, P. Austr. Ph. Ned. PHENYL-DIMETHYL-ISO-PYRAZOLONE. *Commonly known as* ANTIPYRINE.



=186·77 (188·176 I. Wts.)

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) in cachets, tablets, or solution. U.S. *Average dose.*—4 grains.
Is in pearly white crystalline scales or powder, bitterish taste. Gives a deep red colour with solution of ferric chloride, nearly discharged by diluted sulphuric acid.
Soluble 1 in $1\frac{1}{4}$ of water, about 1 in 1 of alcohol and chloroform, and 1 in 40 of ether.
Uses.—It is an analgesic, febrifuge, and hæmostatic, reduces the temperature of fevers, and the pyrexia of pneumonia, pleurisy, phthisis, and erysipelas. In doses of 10 to 15 grains it relieves locomotor ataxy, migraine, facial neuralgia, and sea sickness. Hypodermically for lumbago, sciatica, angina pectoris, biliary and renal colic, and

dysmenorrhœa. A skin rash of purple patches has at times been observed after its use; the urine is not discoloured.

Peppermint water or essence disguises its taste. It may be administered as an enema if contra-indicated by the mouth.

Antidotes.—Administer brandy or ether, atropine, strychnine or oxygen. Warmth to the feet and body.

Incompatible with spirit of nitrous ether, or other nitrites in the presence of free acid, an apparently inert bluish-green iso-nitroso-antipyrine being formed; also with the cinchona alkaloids, forming a precipitate which is soluble in weak acids.—*Vide* also *p.*86.

Further, with phenol, tannic acid, iodine, or mercuric chloride (precipitates); amyl nitrite, ammonia alum, hydrochloric acid, ferric chloride, ferrous and ferric sulphates, cupric sulphate, or nitrous acid, cause discolourations; with calomel, as a highly toxic product may result; sodium bicarbonate decomposes it with production of an odour resembling acetic ether; orthoform produces a pasty mass. In general it is best to administer antipyrine alone.—B. & C. D. ii./04,559.

Liquefactions occur on rubbing it with butyl-chloral hydrate or sodium salicylate, but solutions with the latter keep without perceptible change if dilute. Liquefaction also occurs on mixing with β-naphthol.

Effervescent Antipyrine contains 5, 10 or 15 grains in a drachm. *Dose.*—One teaspoonful or more. Phenazonum Effervescens, B.P.C., contains 8% (about 5 grains in a drachm).

Injectio Antipyrin Hypodermica.—1 grain contained in 2 minims. *Dose.*—8 to 30 minims (0·485 to 1·8 Cc.). The pain it causes may be lessened by the addition of cocaine, as in—

Injectio Antipyrin et Cocainæ Hypodermica, containing 1 grain of Cocaine Hydrochloride in 150 minims of above. *Dose.*—8 to 30 minims.

Tablets of Antipyrine contain 2½ (0·16 Gm.) and 5 grains (0·32 Gm.) each. *Dose.*—1 to 4 or more.

Tablets, Antipyrine 3 grains and **Caffeine** 1 grain.

Chorea may be relieved as also the pains of locomotor ataxy, and its local use in solution may stop epistaxis.

It is said to diminish the quantity of urine and so

useful in enuresis, and to check dysmenorrhœa, and tends to suppress flow of milk.

Reduces temperature rapidly, but this rises again on diminishing frequency of dose. Pyrexia often preferable to saturation with antipyrine.—B.M.J. i./91,684.

Impairment of sight after continued use.—L.ii./91, 1138; B.M.J.E. ii./92,87.

Four attacks of smarting rash from 10-grain doses.—B.M.J. ii./93,944; L. i./96,1562.

Poisonous effects.—B.M.J. i./96,269,511; M.C. Mar. 97,453; B.M.J. ii./99,85.

8 grains twice hourly for the colic of gall-stones.—M.C. Oct.92,46.

Antipyrine intoxication, poisonous effects and deaths.—B.M.J.E. ii./99,7.

In rheumatism very useful, sodium bicarbonate added.—M.A. 1906,431.

Acetopyrine.—*Syn.* ANTIPYRIN ACETO-SALICYLAS.

$$C_6H_4\begin{matrix}O.CH_3CO\\COOH\end{matrix}.C_6H_5.N\begin{matrix}CO\ldots\ldots CH\\N(CH_3).\dot{C}.CH_3\end{matrix} =$$

(365·48 (368·24 I. Wts.).

Dose.—7½ to 15 grains (**0·5 to 1 Gm.**).

A combination of phenazone with acetic and salicylic acids, having slight odour, soluble 1 in 160 only of water, but soluble about 1 in 3½ of Alcohol 90%. An anti-arthritic remedy with analgesic and sedative properties, has been employed in sciatica and hemicrania and is without injurious heart action.—P.J. i./01, 138; B.M.J.E. ii./01,40; M.P. ii./04,466.

Bromopyrin. $C_6H_4Br.N\begin{matrix}CO\ldots\ldots CH\\N(CH_3)\ \dot{C}.CH_3\end{matrix}$ or

$C_{11}H_{11}BrN_2O = 265·12$ (267·128 I. Wts.).

Syn.—ANTIPYRIN MONOBROMIDE.

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**).

In white crystals, ***soluble*** in alcohol and chloroform. Is antipyretic. May be administered in cachets.

Ferripyrin. $Fe_2Cl_6\ 3(C_{11}H_{12}N_2O) = 882·65$ (889·028 I. Wts.).—*Syn.* FERROPYRIN.

Dose.—3 to 8 grains (**0·2 to 0·5 Gm.**).

A compound of ferric chloride and antipyrine, said to contain 64% antipyrin and 12% iron; is a soluble orange-coloured powder. Given for chlorosis and anæmia

as a hæmatinic, especially when an analgesic action is required; acts also as a hæmostatic and local astringent, applied pure or 20% aqueous solution; and in gonorrhœa, injections 1%.—L. i./95,1320; P.J. 1895,990 ii./96,30.

Hypnal. $C.Cl_3.CH(OH)_2C_{11}H_{12}N_2O = 350{\cdot}92$ (353·55 I. Wts.).—*Syn.* MONOCHLORALANTIPYRIN.

Dose.—15 grains (1 Gm.), in cachet or suspended.

A compound of antipyrine and chloral, soluble 1 in 10 of water. Is sedative and hypnotic, specially useful where there is pain or cough.—B.M.J. i./90,970; L. i./91,387; Pr. xlv. 54; P.J. 1890,889,977,161.

Iodopyrin.—*Syn.* IODANTIPYRIN.

$C_{11}H_{11}IN_2O = 311{\cdot}67$. (314.138 I. Wts.)

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

A derivative of antipyrine, in which an atom of iodine replaces one of hydrogen; in white colourless silky needles, tasteless and odourless, slightly soluble in cold water and alcohol, readily in hot. Said to lower temperature and promote diaphoresis in typhus and phthisis.—P.J. 1891,877; L. i./92,263; B.M.J. i./92,22. **Tablets,** 5 grains (0·32 Gm.). *Dose.*—1 to 4.

Pyramidon. Is claimed to be an AMIDO DERIVATIVE OF ANTIPYRIN.

$$C_6H_5N.\begin{cases} CO \ldots\ldots C.N(CH_3)_2 \\ \| \\ N(CH_3).C.CH_3 \end{cases} = 229{\cdot}53 (231{\cdot}256 \text{ I. Wts.}).$$

Dose.—5 to 8 grains (0.32 to 0.52 Gm.).

Is in the form of a white powder, soluble about 1 in 9 of water and 1 in 2 of alcohol 90%. An antipyretic, and has been employed in asthma. A camphorate (*dose*—8 to 12 grains), bicamphorate and neutral camphorate (*dose*—12 to 15 grains), and salicylate (*dose*—8 to 12 grains) are also prepared.—B.M.J.E. ii./03,79.

The camphorates are antipyretic, and have been advocated to suppress the sweats in phthisis. The salicylate is given in rheumatic affections. **Trigemin** (*dose*—12 grains) is a butyl-chloral hydrate compound of pyramidon. Is not a hypnotic; employed for neuralgia.—B. & C. D. i./04,168. Relieves sciatica.—B.M.J.E. i./04,72. In typhoid.—B.M.J.E. i./05,72.

Rubazonic acid is said to be contained in urine of patients taking pyramidon.—P.J. i./05,270.

Salipyrin. — *Syn.* Antipyrinum Salicylicum, P. Austr., P. Belg., Pyrazolonum Phenyl-dimethylicum Salicylicum, P.G. iv.

$C_{11}H_{12}N_2O.C_6H_4(OH)(COOH)$=323·78 (326·224 I. Wts.). *Dose.*—15 to 30 grains (1 to 2 Gm.).

A compound containing 57·7% of antipyrine and 42·3% of salicylic acid, in white crystalline powder, with sweetish taste; sparingly soluble in water, freely in alcohol; decomposed by acids and alkalis.

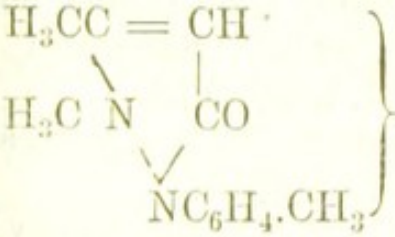
Successful in acute rheumatic fever, but does not prevent relapse; effective also in chronic rheumatism and sciatica. Has antipyretic action, but must be given in dose double that of antipyrine.—B.M.J. ii./90,850 B.M.J.E. ii./90,6; ii./92,20; L. i./92,262.

Recommended for influenza and any acute catarrh.

Useful for menorrhagia.—L. i./95, 1005.

Tablets contain 5 grains (0·32 Gm.).

Tolypyrin.—*Syn.* Tolylantipyrin.



=200·68 (202·192 I. Wts.)

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Antipyrine in which one hydrogen atom of the pheny group is replaced by methyl. In colourless crystals.

Soluble about 1 in 10 of water; freely in alcohol taste bitter.

An antipyretic, antineuralgic, and antirheumatic.

Tolysal.—*Syn.* Para-tolyl-dimethyl-pyrazolone Salicylate. $C_{12}H_{14}N_2O.C_6H_4.OH.COOH$.=337·69 (340·24 I.Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.)

A compound of tolypyrin and salicylic acid, in small white crystals, slightly soluble in water, freely in alcohol. Is antipyretic and analgesic in articular rheumatism and neuralgia.—P.J. 1893,605.

Tussol.—*Syn.* Antipyrine Mandelate.

$C_{11}H_{12}N_2O.C_6H_5CH.OH.COOH$ = 337·69 (340·24 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.); for young children 1 grain is a dose.

In white soluble crystals. In whooping-cough and bronchial disorders.

Phenocoll Hydrochloridum, Hydrochloride of Amido-acet-para-phenetidin, a derivative of Phenacetin.

$$C_6H_4\begin{Bmatrix} O.C_2H_5 \\ NH(C_2H_2O)NH_2 \end{Bmatrix} HCl. = 228{\cdot}93 (230{\cdot}65. \text{ I. Wts.})$$

Dose.—7 to 15 grains (0·5 to 1 Gm.).

A white crystalline powder with sharp saline taste, soluble about 1 in 16 of water.

Reduces temperature without rigors or sweats, of marked effect in rheumatic fever and phthisis, but none in gonorrhœal rheumatism. Is quicker in action than phenacetin; small doses in hectic fever. May be used hypodermically.

Combined with piperazine in effervescent form (*q.v.*) is specific in rheumatoid arthritis.

Also beneficial in neuralgia arising from sudden cold. —L. ii./92,438; B.M.J.E. ii./92,4. Successful in malaria; as a prophylactic.—P.J. i./96, 178.

May cause collapse and cyanosis in children and cases of advanced phthisis.—B.M.J. ii./98,1056.

Useful palliative in pertussis $\frac{1}{6}$ to 2 grains hourly.—P.J. ii./00,544. Also for headaches.

Salocoll,—*Syn.* Phenocoll Salicylate.

$$C_6H_4\begin{Bmatrix} O.C_2H_5 \\ NH(C_2H_2ONH_2)C_6H_4\,OH.COOH \end{Bmatrix} = 329{\cdot}75 \ (332{\cdot}24 \text{ I. Wts.}).$$

Dose.—10 to 30 grains (0·65 to 2 Gm.).

In small white silky crystals, less soluble in water than phenocoll hydrochloride. It combines the actions of phenocoll and salicylic acid, as an antipyretic, antineuralgic, and antirheumatic.

Pyoktanin. A trade name for **Methyl-Violet.**

A mixture of the hydrochlorides of penta and hexa methyl-para-rosanilines, $C_{19}H_{12}(CH_3)_5N_3.HCl = 390{\cdot}85$ (393·794 I. Wts.) and $C_{19}H_{11}(CH_3)_6N_3.HCl = 404{\cdot}76$ (407·810 I. Wts.) in green crystalline powder, ***soluble*** 1 in 75 of water, 1 in 20 of alcohol 90%; solutions should be freshly made and kept in dark bottles, as they are decomposed by light. A 1 in 500 solution has been used as an injection, and 1% lotion for malignant growths

or as a dusting powder; and has been injected around boils.

Cardiac dropsy has been treated by internal doses of $\frac{1}{6}$ grain thrice daily. It increases the perspiration and causes diuresis.

Purulent otitis media treated with a mixture of pyoktanin blue 1, boric acid 9, applied by a powder insufflator or on a little cotton wool, or a solution may be used. A little alcohol will remove the stain caused on the skin.—M. Arch., Dec.,05,383.

A yellow variety of Pyoktanin is said to be an **Auramine**, $C_{17}H_{21}N_3HCl$=301·48 (303·746 I. Wts.).

Soluble 1 in 80 of water and 1 in 105 of Alcohol 90%.

Thallinæ Sulphas, Tetrahydroparamethyl-oxychinoline Sulphate.

$[C_9H_9(OCH_3)NH]_2H_2SO_4 + 2H_2O$=456·94(460·396 I. Wts.). *Dose.*—3 to 5 grains (**0·2 to 0·32 Gm.**).

In white or whitish granular crystals, melts at 212° F., has a nauseous, slightly pungent taste.

Soluble 1 in 7 of cold water which darkens by exposure to light.

Uses.—Is antipyretic internally. A powerful drug; nine grains have proved fatal. Injection of 1 to 2% aqueous solution is useful in gonorrhœa.

Bougies of Thalline Sulphate, $2\frac{1}{2}$ and 5%. Contain 1 or 2 grains in each, combined with gelatin, and are made $2\frac{1}{2}$ or 4 inches long.

'Collapsubes,' with catheter attachment, of Thallin, Ointment 5% with Cocaine Hydrochloride 2% are prepared for the treatment of gonorrhœa.

Antrophores, or spiral spring bougies coated with gelatin, and medicated with 5 (or weaker $2\frac{1}{2}$)% of Thalline, have been used successfully for gonorrhœa. Are recognised in P.G. iv. For others, *vide* Index.

Thermodin.—*Syn.* ACETYL-PARA-ETHOXY-PHENYL-URETHANE.

$$C_6H_4\begin{cases}O.C_2H_5\\ N<\begin{matrix}CH_3CO\\ CO.OC_2H_5\end{matrix}\end{cases}$$=249·29 (251·176 I.Wts.)

Dose.—5 to 15 grains (**0·32 to 1 Gm.**).

In colourless, tasteless crystals, very slightly soluble in water. Antipyretic, fall of temperature gradual, no

unpleasant symptoms.—B.M.J.E. i./94,12; P.J. 1894, 731; 45 to 75 grains given per diem is a mild diuretic. —B.M.J.E. i/06, 16.

COCÆ FOLIA.

Coca Leaves (*Off.*). *Syn.* Cuca.

Dose.—½ to 2 drachms (2 to 8 Gm.).

The dried leaves of *Erythroxylum Coca* and its varieties (*Linaceæ.*) Two varieties are met with, North Peruvian or Truxillo variety, *Erythroxylon Coca* var. *novo-granatense* (Morris), of a pale green colour, small and thin, and Huanuco or Bolivian variety, *E. bolivianum* (Burck), thought to be a distinct species, which are larger, broader, and thicker, of a dull olive colour. The characteristic nner curved lines from base to apex are on this more marked.

The leaves contain the crystalline alkaloid Cocaine, *q.v.* A content of 0·5% of this base is suggested as a standard. —P.J. ii./02,495. They are said to be most active when freshly dried, and are much used by the natives in Bolivia and Peru, miners, travellers, and others.

Assay of Coca (U.S. 0·5% ether-soluble alkaloids).

10 Gm. of the leaves (in No. 60 powder) is treated with a mixture of chloroform, ether, and ammonia. The percolate (and successive washings with the same mixture) are transferred to a sufficiency of sulphuric acid. Ammonia is added to alkalinity, and the liquid is shaken out with ether in three repeated quantities. The ether solution is then evaporated to dryness, and dissolved in a measured volume of $N/_{10}$ sulphuric acid, which is finally backtitrated with $N/_{50}$ potash in the customary manner, employing hæmatoxylin and the factor 0·03 to ascertain the percentage of ether-soluble coca alkaloids. (1 Cc. $N/_{10}$ acid = 0·03 Gm. cocaine approx.)

Elixir Cocæ.—1 in 6 of Simple Elixir.

Dose.—1 to 4 drachms (3·5 to 15 Cc.) in water is a palatable preparation.

Extractum Cocæ.

Dose.—2 to 15 grains (0·13 to 1 Gm.), in pills or pastils. Made with proof spirit; 1 = about 4 of leaves.

Powdered extract of coca is supplied commercially, strength 2·5 % cocaine.

Extractum Cocæ Liquidum (*Off.*).

Syn. Extractum Erythroxyli Fluidum, U.S.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.). 1 = 1 of leaves exhausted with 60% alcohol.

If freed from wax, it is miscible with water and more palatable. A standard of 0·5 % of Cocaine would be desirable.

Fluidextractum Cocæ, U.S., *Dose.*—30 minims. Standard 0·5 Gm. ether-soluble alkaloids in 100 Cc.

Infusum Cocæ.—1 in 50 of boiling water.

Is a refreshing beverage with a slice of lemon.

Pastillus Cocæ Extracti.—2½ grains (0·15 Gm.) of the extract in each.

Dose.—One every two or three hours.

Useful for loss of voice due to weakness or relaxation of the vocal cords.

Vinum Cocæ.—About 1 of Leaves in 8 of Sherry.

Dose.—¼ to ½ ounce (7 to 15 Cc.) diluted with wine or water. Checks vomiting of irritable stomach.

This is strongly medicated; it must contain half a grain of alkaloid in the ounce, or it cannot be sold without a licence. Weaker preparations, containing about 1 in 20 or 30 of a sweet red wine, are sold by wine merchants.

U.S. has Fluidextract of Coca 65, Alcohol U.S.) 75, Sugar 65, Red Wine to 1000.

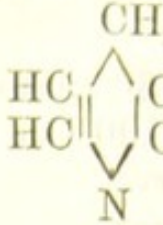
Uses of Coca.—Coca has been praised as a nervine and muscular tonic, preventing waste of tissue, appeasing hunger and thirst, relieving fatigue, aiding free respiration, and as being useful in various diseases of the digestive and respiratory organs; it is recommended for indigestion, gastralgia, gastrodynia, nausea, sickness, distaste for food, is given to relieve pain, nausea, vomiting or discomfort caused by excess in either eating or drinking or by pregnancy, and as a cure for morphine and alcohol craving. In using it for this in America it is said in some cases to have produced 'Coca Craving.' The leaves are sometimes smoked to relieve asthma; and used generally for the stimulant and narcotic effect of tobacco and alcohol.

Cocaina (*Off.*). *Syn.* METHYL-BENZOYL-ECGONINE. $C_9H_{13}(CH_3)(C_6H_5CO)NO_3$=300·93 (303·208 I.Wts.)

Dose.—$\frac{1}{20}$ to ½ grain (0·0032 to 0·032 Gm.), in a pill or tablet.

This important alkaloid, obtained from Coca, was first isolated by Niemann in 1860. It crystallises in

shining monoclinic prisms, and is almost insoluble in water. Constitutionally it is ecgonine with the hydrogen



$[CH(OH).CH_2COOH]$=183·77 (185·16 I. Wts.)

Ecgonine

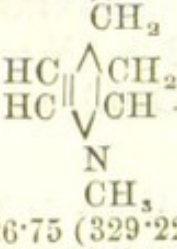
atoms in the carboxyl and hydroxyl groups replaced by a methyl and benzoyl group respectively. Hot water decomposes it, forming an acid solution which contains benzoylecgonine, ecgonine, and cocaine benzoate. It is almost tasteless, but produces a tingling numbness on the tongue and local anæsthetic action on all mucous membrane. Good Coca leaves yield 0·5 % or more of Cocaine, but the average is less, if fermented—often *nil*.

Soluble 1 in 10 of 90% alcohol, about 1 in 100 of liquid or soft paraffin. In some specimens of liquid paraffin the solubility is only 1 in 150; 10 to 20% of olive oil will assist solubility, freely so in chloroform, ether (about 1 in 4), oil of cloves, and many other volatile oils, and 1 in 10 of castor, and other fixed oils. The paraffin and castor oil solutions diluted have proved serviceable in eye cases. Soluble also in about 1 in 3 of benzol, toluol, and amylic alcohol, and 1 in 80 of petroleum spirit. Insoluble in glycerin. Most of the Cocaine now used is manufactured in a crude form in Lima, and is purified and recrystallised or converted into the hydrochloride after its arrival in Europe.

Cocaine hydrochloride dissolves in cold sulphuric acid without colour, but chars with hot.

A Cocaine Salt in solution may be estimated by precipitating Cocaine periodide with decinormal Iodine.—P.J. i./01, 553, 602; ii./01, 223, 254.

The four alkaloids Cocaine, Truxilline $C_{19}H_{23}NO_4$= 326·75 (329·224 I. Wts.)(previously called Cocamine or Isatropyl-cocaine), Cinnamyl-cocaine



$CH(O.C_6H_5.CH:CH.CO)CH_2.COO(CH_3)$ =

326·75 (329·224 I. Wts.), and Tropa-cocaine $C_8H_{14}NO.C_6H_5CO$ =243·35 (245·192 I. Wts.) are known to exist in coca leaves.

The last-mentioned is much less toxic than Cocaine, *q.v.* and it occurs in only very small proportion in crude cocaine. In reality there are two isomeric Truxillines designated α and β Truxilline. The α Truxilline is in predominance in the natural product.

Cocaine, truxilline and cinnamyl-cocaine being ecgonine derivatives yield ecgonine, acids, and methyl alcohol on hydrolysis. This fact is of importance commercially as the amorphous residue remaining after extracting as much as possible of the crystalline cocaine can be converted into ecgonine, and this by treatment with benzoic anhydride and methyl alcohol can be converted synthetically into cocaine.

Garsed suggests a method of estimating cocaine in crude cocaine—the impurities truxilline and cinnamyl-cocaine being converted by alkaline hydrolysis into truxillic and cinnamic acids.—P.J. ii./03,784; C.D. ii./03,800.

Gravimetric method of assay.—P.J. ii./05,724.

*Pure Cocaine (the alkaloid) is soluble in fats and oils, and its salts are not so. Some hold, therefore, that the base should always be used when it has to be combined with fatty or oily substances, for use externally, and indeed on mucous surfaces, but for suppositories, bougies, buginaria and pessaries which are to act upon wet mucous membrane, the hydrochloride, in the opinion of the writers, would act more efficiently, and is to be recommended. The same remark applies to all alkaloids,—soluble salts should be employed for these purposes.**

Antidotes.—Toxic effects are best counteracted by amyl nitrite, nitroglycerin, digitalis, strychnine, or ammonia, with strong coffee by mouth or enema, and ether hypodermically. Anæsthesia by chloroform and ether may be required to prevent respiratory spasms.

Toxicology.—Is converted into ecgonine in the organism. Methods of detection.—Y.B.P.,1902,60.

Bougies of Cocaine. ½ grain (0·032 Gm.) or more, with cacao-butter. Are useful in urethral affections.

Cocaine-Lanolin, containing 10% Cocaine Hydrochloride, is a special preparation which is found useful in treatment of dental cavities containing hypersensitive dentine prior to filling. A small amount to be carefully sealed in the cavity and left for two or three days.

Cocaine in Clove Oil. 5% is useful to relieve toothache and earache.

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* Since this was in print, by a strange coincidence Cripps advocates similarly for the *Off.* ointment.—P.J. July 28,c6.

Collodium Cocainæ. 2% in flexible collodion. Allays the itching, and is a cure for inflamed chilblains.

Emplastrum Cocainæ.—1 dissolved in 50 of lead plaster heated in a water-bath. Useful for intercostal neuralgia, sciatica, tender corns, bruises, &c.

Nebula Cocainæ Oleosa, C.L.T.E.

Cocaine (base) 25 grains, Almond Oil 1 ounce.

Trial shows that this quantity of cocaine base will not dissolve except with intervention of oleic acid. The following produces, however, a clear solution:—Cocaine Base 1, Oleic Acid 4, Liquid Paraffin to 20. Stronger solutions can be made, but this 5% strength should prove sufficient in most instances. Furthermore 12 grains of the base will dissolve in 1 ounce of almond oil.

Oleatum Cocainæ, U.S. Cocaine 5, Alcohol 5, Oleic Acid 50, Olive Oil *q.s.* to 100.

Oleum cum Cocaina.

A 2% solution, more or less, if ordered, in almond oil, is mostly used. This is useful for earache. For the eye a 2% solution in **Castor Oil** is used, may be combined with Homatropine (*v.p.* 160); for catheters, a solution in equal parts castor and almond oils does well, it is viscid, and does not congeal in winter.

Guttæ Cocainæ Oleosæ, St. G. H. Cocaine 8 grains, Castor Oil 1 ounce.

Suppositories and **Pessaries** $\frac{1}{2}$ grain (0·032 Gm.), or more with cacao-butter.

For many purposes, *e.g.*, painful hæmorrhoids a **Compound Suppository** of Cocaine $\frac{1}{6}$ grain with Morphine $\frac{1}{2}$ grain is useful.

Tabellæ Cocainæ, Cocaine Tablets. $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$, and $\frac{1}{20}$ grain with chocolate. The usual dose is $\frac{1}{20}$ grain.

Dose.—1 every quarter-, half-hour or hour, quickly eaten and swallowed. Useful for sea sickness, chloroform or alcoholic sickness, and sickness of pregnancy.

Unguentum Cocainæ (*Off.*).—Cocaine 1, Oleic Acid, by weight, 4 (1 grain = 2 drops), heat gently to dissolve, add Lard 20. Useful where absorption is required, as in facial neuralgia, shingles, eczema, erysipelas, urticaria, and pruritus (R.O.H. has Cocaine 1, Soft Paraffin 50; heat to dissolve).

Cocaine is soluble 1 in 2 of anhydrous lanolin if ently warmed. Useful to anoint internal os in labour. –B.M.J. ii./94,1427; P.J.1895,912.

Vaselinum Cocainæ. Is made with Cocaine (base), 1, 2, 4, and 10%. The 1 or 2% are suitable for eye work, and the 4 and stronger percentages are useful for catheterisation, burns, and for intense sensitiveness of parts, pruritus, &c.

Cocainæ Citras.

$[C_{17}H_{21}NO_4]_2C_3H_4OH.(COOH)_3 = 792{\cdot}48$ (798·48 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

In deliquescent white crystals; used by dentists.

Cocainæ Formas.

$C_{17}H_{21}NO_4.H.COOH = 346{\cdot}60$ (349·224 I. Wts.)

Prepared by combining Cocaine 303 with 46 of pure ormic Acid.

Crystalline needles, ***soluble*** about 1 in 40 of water, nd about 1 in 2 of alcohol 90%. Slightly soluble in loroform and ether. Insoluble in olive oil or in vaseline.

ocainæ Hydrobromidum.

$C_{17}H_{21}NO_4.HBr. = 381{\cdot}28$ (384·176 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.). Is stable salt, in small, white, hard, acicular crystals.

ocainæ Hydriodidum.

$C_{17}H_{21}NO_4.HI = 427{\cdot}83$ (431·186 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

In hard, colourless columnar crystals, slightly soluble water. Useful for producing dental anæsthesia.

ocainæ Periodidum, Di-Iodo-Cocaine Hydriodide.

$C_{17}H_{21}NO_4.HI + I_2 = 679{\cdot}63$ (685·126 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain.

In violet-black crystals, prepared by decomposition Cocaine Hydrochloride, Potassium Iodide and slight cess of iodine in strong alcoholic solution, or by direct action of alcoholic solutions of the base and of iodine. B.M.J. i./01,1408.

Has been tried for the vomiting of pregnancy.

ocainæ Hydrochloridum (*Off.*).

$C_{17}H_{21}NO_4CHCl = 337{\cdot}12$ (339·666 I. Wts.)

Off. Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.), t more may be given, in solution, pill, or pastil.

This salt forms light, shining, lamellar crystals, with bitterish taste; being soluble in half its weight of water, the tingling numbness or local anæsthesia it produces on the tongue is more intense than that produced by the base. One part of Cocaine base = 1·12 of the Hydrochloride.

Soluble in alcohol and in glycerin, insoluble in ether, fats, and oils. It will crystallize with 9·5% of water of crystallization, but the anhydrous salt alone is official. It dissolves in sulphuric acid, *v.* Cocaine.

Incompatible with ammonium carbonate, (soluble in excess), carbolic acid, mercuric and mercurous chlorides. It is also precipitated by borax.*

Permanganate Test.

Solution of potassium permanganate, B.P. in excess, added to a solution of not less than 1% of it should not change colour within one hour (absence of cinnamyl-cocaine and other products). The salt should not only be in good crystals, but should, by the following modification of **MacLagan's Test,** yield a distinctly crystalline precipitate of pure Cocaine within three minutes —when 1 grain of it is dissolved in 2 ounces of distilled water, and six to eight drops of solution of ammonia, B.P., are added and well stirred. If more than 4% of amorphous alkaloid (principally isatropyl-cocaine, now termed Truxilline) be present, there will be only a cloudiness. The precipitate re-dissolves after twenty-four hours or more, the Cocaine being converted into methyl alcohol and benzoyl-ecgonine. Isatropyl-cocaine is highly toxic.

MacLagan's test is still relied upon as one of the most satisfactory tests for purity.

P.G. iv. gives the additional test of Metzer: 0·05 Gm. cocaine hydrochloride dissolved in 5 Cc. water, 5 drops 3% chromic acid solution added. A yellow transient precipitate is produced, but precipitates again on further addition of 1 Cc. hydrochloric acid, showing absence of Günther's base as impurity.

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* Where borax and cocaine hydrochloride are prescribed together a weight of Boric Acid equal to that of the borax should be ordered at the same time to prevent precipitation. —Y.B.P., 1903, 270.

In dispensing White Precipitate with cocaine hydrochloride in the form of an ointment, dissolve the cocaine salt in a drop or two of water. Rub the white precipitate down with a little almond oil, mix, and add the remainder of the ointment base—*e.g.*, soft paraffin.—Y.B.P. 1903, 271.

Dental Anæsthetic (Martindale) is used as a local anæsthetic for extraction. It contains 1 % of Cocaine Hydrochloride and Iodine in the requisite chemical combination together with hæmostatics. It is believed to be harmless in action.

In dental work the injection of more than ½ grain of cocaine is inadvisable.—B.M.J. i./05,168.

Alvatunder is said to contain Cocaine 1 % with small proportions of Carbolic Acid, Decolourised Tincture of Iodine, Glycerin and Water.—P.J. ii./05,7.

Aurinaria Cocainæ Hydrochloridi.—EAR CONES, contain $\frac{1}{10}$ grain in each with gelatin.

Buginaria Cocainæ Hydrochloridi, $\frac{1}{6}$ grain. Useful in hay fever, sometimes combined with $\frac{1}{120}$ grain of atropine sulphate in each.

Guttæ Cocainæ Hydrochloridi, R.O.H., 1 in 50. St. M.'s H. has 2½ %.

Injectio Cocainæ Hypodermica (*Off.*)*

Salicylic Acid 1½, Boiling Distilled Water *q.s.* to produce 1000 when cooled, and Cocaine Hydrochloride 100 added. *Dose.*—2 to 5 minims (0·12 to 0·3 Cc.).

A solution up to the strength of 50 % may be prepared in salicylic acid solution of the above strength, which is nearly saturated.

Hypodermic Tablets $\frac{1}{10}$, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, and $\frac{1}{2}$ grain of the hydrochloride in each.

Lamellæ Cocainæ, Discs of Cocaine (*Off.*); R.O.H. Discs of gelatin, each containing $\frac{1}{50}$ grain of Cocaine Hydrochloride are for ophthalmic use. These should be prepared in an atmosphere carefully rendered aseptic. Also prepared containing $\frac{1}{100}$ and $\frac{1}{200}$ grain

* **Hypodermic Syringes** are—1. Metal or vulcanite mounted (capacity 15 or 20 minims), with glass barrels. 2. All glass. 3. All metal, graduated in 20 minims. 4. Antitoxin, capable of thorough sterilisation, capacity 3, 5 and 10 cubic centimetres, in plated metal cases. The tightness of the piston is adjustable. 5. Syringes with bent, blunt needle having wide lumen. Suitable for injection of sterilised paraffin in plastic operations. A new Syringe for this purpose is described L. ii./03, 612. 6. Eucaine Syringes for use with Beta-Eucaine solution for infiltration.

Hypodermic Cups, of glass, are intended for holding the solution for injection whilst drawing up into a hypodermic syringe, or for dissolving a tablet with the aid of a glass rod as a pestle.

in each, and in combination with Atropine (*v.p.* 156), Homatropine (*v.p.* 161), and Physostigmine (*v.p.* 558).

Nebula Cocainæ Hydrochloridi, C.L.T.E.—Cocaine Hydrochloride 48 grains, Saturated Boric Acid Solution 1 ounce.

R.D.H. has Cocaine 5 grains, Boric Acid 3 grains, Water to 1 ounce. To be freshly prepared.

Liquor Cocainæ et Antipyrin. — Cocaine 5, Antipyrin 5, Phenol 1, Water to 100. Used for painting the interior of the larynx during the operation of thyrotomy, and applied to the nostrils on cotton wool for small operations, *e.g.*, with the cautery. – C. Nourse.

Pastillus Cocainæ Hydrochloridi. $\frac{1}{10}$ grain (0·0065 Gm.) in each (or more if ordered).

Useful in allaying throat irritation and hoarseness.

Pastillus Cocainæ et Morphinæ contains $\frac{1}{15}$ grain (0·0043 Gm.) Cocaine and $\frac{1}{30}$ grain (0·0022 Gm.) Morphine. Useful for coughs.

Pastils of Cocaine, $\frac{1}{50}$ grain, with **Antipyrin** 3 grains, are prepared. They are useful in the treatment of asthmatic affections.

Pilula Cocainæ Hydrochloridi. $\frac{1}{5}$ grain (0·013 Gm.) in each (or more, if ordered), with milk sugar.

'Solubes' Cocaine Hydrochloride contain 1 and 5 grains for lotions, also $1\frac{1}{8}$ and $2\frac{1}{4}$ grains. Those weighing $1\frac{1}{8}$ grain produce a 1% solution on dissolving in 2 drachms of water, and those weighing $2\frac{1}{4}$ grains with 1 fluid drachm of water produce 4% solution.

'Sterules,' Ophthalmic are prepared containing Cocaine Hydrochloride solution 10 grains to the ounce (2·3%).

For general purposes **Large 'Sterules'** (tube form) are prepared containing 10 minims of Cocaine Hydrochloride Solution 5% and 10% strength, *vide* also Index for **Sterules, Hypodermic.**

Hypodermic 'Sterules' of Cocaine Hydrochloride $\frac{1}{6}$ grain, with **Adrenalin** $\frac{1}{500}$ grain are prepared.—(*c.f.p.* 802.)

Syrupus Cocainæ. Hypodermic injection of Cocaine Hydrochloride 22 minims, Syrup of Orange Flower to 1 ounce. *Dose.*—1 drachm = $\frac{1}{4}$ grain.

Trochisci Cocainæ Hydrochloridi. $\frac{1}{12}$ grain (0·0054 Gm.) in each. **T.H.** has $\frac{1}{10}$ grain.

Cocainæ Lactas. *Dose.*—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.), White non-crystalline mass easily soluble in water. Has been employed as substitute for the hydrochloride, *e.g.*, for injections in painful ulcerations within the bladder.

Cocainæ Nitras, Cocaine Nitrate

$C_{17}H_{21}NO_4.HNO_3 = 363{\cdot}51$ (366·256 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

In large colourless crystals, readily soluble in water. Is compatible with silver nitrate, and if used previously in solution lessens the pain caused by the latter salt.

Cocainæ Phenas. *Syn.* Cocaine Carbolate.

Dose.—In pill, $\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

A slightly soluble pasty compound, used by dentists and given for gastralgia.

In nasal and laryngeal use anæsthesia is slower, but more prolonged than after hydrochloride. Is strongly antiseptic and may safely be used on cut surfaces, as its coagulating effect on albumen prevents too rapid action. —B.M.J.E. i.93,80.

Sprays.

For Cocaine, should have very fine aperture, the jet being preferably of metal. For other medicated solutions they may be of vulcanite or glass.

Cocainæ Salicylas, $C_{17}H_{21}NO_4.C_6H_4.OH.COOH$ = 437·94 (441·256 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.). Is in minute snow-white crystals, slightly deliquescent; it forms a solution which keeps well. ***Soluble*** 5 in 1 of water, $2\frac{1}{2}$ in 1 of alcohol 90%. In spasmodic asthma, the hypodermic injection of a full dose at the beginning relieves the attack.

Cocainæ Sulphas.

$C_{17}H_{21}NO_4.H_2SO_4 = 398{\cdot}27$ (401·284 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

A deliquescent granular white powder.

Uses of Cocaine and its Salts.

Besides rendering the superficial structures of the eye anæsthetic, Cocaine is a mydriatic, and paralyses the accommodation. When applied to a mucous membrane it blanches the part, and simultaneously anæsthesia occurs. The application of an ointment of the pure alkaloid,

made with lard, to a surface will remove the pain of eczema, erysipelas, facial neuralgia or shingles, and the irritation of urticaria or pruritus. Burns and scalds should first be brushed over with a 4% aqueous solution of the hydrochloride, and the pure alkaloid combined with Carron oil (Linimentum Calcis), petroleum cerate, or boric acid ointment, afterwards applied on cotton wool or lint. For fissured nipples, or stings and bites of insects an aqueous solution may be applied. The irritability of inflamed mucous surfaces, as in hay-fever, influenza, coryza, bronchitis, spasmodic asthma, laryngitis, and pharyngitis, is much relieved by the spray of a watery solution of a cocaine salt. Spasmodic and painful affections of the vagina, causing dyspareunia and vaginismus, may be minimised by vaginal injections of a quarter of a grain of cocaine in 1 per cent. oily solutions. In dentistry, it is useful in toothache. The pure alkaloid is preferable to the salts for this purpose, as, being only slightly soluble in water, it is less liable to be washed away by the saliva. If a little be inserted in the cavity of a carious tooth and covered with a plug of wool soaked in chloroform of mastiche (*v.p.* 236) all pain is obtunded for a considerable time. A strong solution in oil of cloves is also useful. In extraction the **Dental Anæsthetic** (*v.p.* 275) will be found effectual. A strong aqueous solution of the hydrochloride may be painted on the surrounding gum as an alternative or supplement.

Solutions of cocaine hydrochloride have been employed topically in excision of the tonsils, cauterizing the turbinated tissue of the nose, painting chancres previous to the application of nitric acid or other caustics, opening abscesses, removing polypi, and many cases of iridectomy and operation for cataract, squint, and the removal of foreign bodies from the eye. For the eye sterile aqueous solutions of the hydrochloride of cocaine of mostly 2, or up to 4% are used, and for other purposes from 4 to 20 or even 50%; of the weaker solutions it is necessary to repeat the application three to five times, at intervals of three to five minutes. Normal saline solution may be used as a vehicle for the ophthalmic solution with advantage. No operation should be commenced within at least ten minutes of the first application. Injurious effects, either local or constitutional, rarely follow its use.

Cocaine is a stomachic, useful after excess either in eating or drinking, in distaste for food, in sea sickness and vomiting of pregnancy or from other causes.

Rectal and prostatic pains are relieved by ½-grain suppositories.

In eye operations, the diminished elasticity produced by cocaine may cause inconvenience.

Camphor 5, Chloral 5, Cocaine Hydrochloride 1, warmed, form an oily liquid which cures toothache.

A rectal injection checks diarrhœa and dysentery.

Cocaine is regarded as a general protoplasmic poison. It stops the movement of the cilia of spermatozoa and white corpuscles. Has a special affinity for nervous tissue.

Local Infiltration Anæsthesia is produced by solutions of cocaine (and eucaine, *v.p.* 283) used by subcutaneous injections made along the lines of proposed incisions, and then into deeper parts before cutting them, and into the sheaths of nerve trunks to annul sensation in parts of limbs, &c. Its action commences in three minutes, increases for ten to twenty minutes, and mostly disappears within half an hour. The anæsthesia may be prolonged by applying an Esmarch's bandage when possible above the site of injection; this has also the advantage of lessening the risk of toxic symptoms, as the delay of cocaine (and eucaine) in the tissues renders it innocuous, either by fixing it there or destroying it locally. **Cocaine and Adrenalin.**—COMBINED USE. Recently solutions of Adrenalin Chloride (*pp.*283, 800 *et seq.*), have been added to the anæsthetic injections to constrict the blood vessels and to cause a local anæmia, and so that there may be less bleeding from cut surfaces.—B.M.J.E. ii./03,60; but there is a risk of local gangrene.—B.M.J.E. i./04,18.

The use of Cocaine and Adrenalin has been advocated for anæsthetising the urethra by swabbing with a plug of cotton wool soaked with 1 Cc. of a 1% solution of Cocaine Hydrochloride to which 3 drops of a 1 in 1,000 solution of Adrenalin have been added.

For infiltration a 0·01% solution of Cocaine with 3 to 5 drops of Adrenalin solution 1 in 1,000 to each 100 Cc. is sufficient.

10 Cc. of 1 in 200 Cocaine Hydrochloride Solution with 10 minims of Adrenalin Solution 1 in 1,000.—B.M.J.E. ii./04,60.

Sterules, Hypodermic, of Cocaine and Adrenalin are prepared. *See* p. 276.

For painless tooth extraction 0·01 to 0·015 Gm. of Cocaine in from of 1 to 2 Cc. of normal saline with 3 drops of Adrenalin solution added. One half to be injected in front and the other behind the tooth, as near the periosteum as possible.

Cocaine and Adrenalin for producing anæmia in the Finsen light treatment of ozœna.—B.M.J.E. i./04,52.

Lumbar Puncture Anæsthesia.—Anæsthesia for major operations is produced by intra-spinal injections, sometimes with trace of morphine added; general effects not manifest but local below puncture very marked. Injections of a ½% solution into the spinal canal to produce anæsthesia for operations.—L. ii.99,1536; B.M.J.E. ii./00,88 i./01,3; Pr. lxv.178; M.C. 1901,377; Med. Ann. 1901,118; L. i./02,912. Subarachnoid injection produces uterine contraction, and may induce labour.—L. i./01,645. It has been followed by a higher death rate than administration of either Chloroform or Ether.—M.A., 1903.

Cocaine Ionisation by voltaic battery (from the positive electrode) using a solution of the hydrochloride 5 to 10% strength—the skin sensibility is abolished in 10 minutes; has given speedy relief of pain in tabes dorsalis (Gowers).—B.M.J. i/05,5.

To this method of administering drugs the term **Kataphoresis** is applied—the medicament is carried by osmosis through the tissues between the two poles. Quinine, potassium iodide, soluble mercurials, chloroform and ether have been thus administered. The pad of the + electrode is soaked with the medicament and placed on the part, the − electrode being a little distance away. Lithium iodide in 5% solution has been used for syphilitic affections.—H.

In dentistry, is of doubtful advantage, the gums do

not absorb it; cases of poisonous symptoms following its use.—B.M.J. ii./90,732 ; L. ii./01,5118.

Lithotrity rendered painless by the injection of 16 grains dissolved in 12 ounces of warm water into the bladder.—B.M.J.i./88,972.

Recommended to give 1 drop Nitroglycerin Solution a minute before injection of cocaine, repeating at intervals if the pulse and temporal region be not affected.—B.M.J. ii./91,1204 ; L. ii./94,420.

A 10 % solution on wool to rigid os uteri in first stage of labour produces rapid dilatation.—B.M.J. ii./98,1374.

Tropacocaine.— *Syn.* BENZOYL-PSEUDO-TROPEINE.

$C_8H_{14}NO.C_6H_5CO.HCl = 279{\cdot}54$ (281·65 I. Wts.)

Obtained from Java Coca. The **Hydrochloride** is freely soluble in water, and is a powerful anæsthetic; in the eye causes neither ischæmia nor irritation or hyperæmia. 3 % solution recommended; anæsthesia quicker than with Cocaine, but more transitory; the action may be kept up by adding a drop from time to time. Mydriasis occurs occasionally but is slight. Injection into gums in large doses only affected pulse for 10 minutes, and did not affect respiration. Employed where it is desired to produce anæsthesia without dilatation of the pupil.

Infiltration with solution has relieved lumbago and sciatica.—M.A. 1904,614.

Tablets (Hypodermic) of Tropacocaine Hydrochloride contain $\frac{1}{30}$ grain.

Neutral aqueous solutions keep apparently unchanged for an indefinite period.—P.J. i./99,431.

Intraspinal Anæsthesia by Tropacocaine.

Anæsthesia by spinal injections of 1 % tropacocaine hydrochloride dissolved in the spinal fluid said not to be dangerous, and is less irritating than a similar solution of Cocaine. — B.M.J.E. i./02,43,75 ; L. i./02,912. Tried for puerperal convulsions.—B.M.J.E. ii./02,6.

Acoine. Di-para-anisyl-mono-phenethyl-guanidine Hydrochloride.

$C{=}NH.C_6H_4O(CH_3)$
$C{=}NC_6H_4O(C_2H_5)$, $HCl = 424{\cdot}58$ (427·778 I. Wts.).
$C{=}N\,HC_6H_4O(CH_3)$

A white crystalline powder, soluble 6 in 100 of water, is recommended as a local anæsthetic and for sub-

cutaneous injection in eye surgery.—L. ii./99,1082; B.M.J. i./99,1340; B.M.J.E. ii./99,76. Has also disinfectant properties. A 2% solution in normal saline is employed as an anæsthetic in dentistry.

Eucainæ Hydrochloridum. B. *β*-EUCAINE.

$C_5H_4N.CH_3(C_6H_5.CO)(CH_3)_4.OH.CO.OCH_3.HCl$= 367·94 (370·722 I. Wts.).

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ grain (0·0065 to 0·032 Gm.) or more. The hydrochloride of Benzoyl-vinyl-diacetonalkamine. A synthetic compound allied to Cocaine, in small white opaque crystals, ***soluble*** about 1 in 30 of water. 2% solutions are used in ophthalmic work.

Injectio Eucainæ Hypodermica, R.D.H.

Eucaine Hydrochloride 18 grains, Distilled water to 1 ounce. For dental extraction.

Dose.—5 to 10 minims = $\frac{1}{5}$ to $\frac{2}{5}$ grain approximately

Eucaine Lactate *β*.

$C_{19}H_{28}NO_4.CH_3.CHOH.COOH$=421·12 (424·312 I Wts.). *Dose.*—$\frac{1}{10}$ to $\frac{1}{2}$ grain. (0·0065 to 0·032 Gm.).

A white crystalline salt, having the advantages of the Alpha eucaine (now out of use). Aqueous solutions as strong as 25% may be prepared.

Also soluble about 1 in 8 of alcohol (90%).

For ophthalmic work and in dentistry 2 to 3%; for infiltration 0·12%; regional anæsthesia 2·5%; nose, throat, and ear 10 to 15%.

Eucaine is slower in action than cocaine and less active, solutions of double the strength that of cocaine being necessary, but anæsthesia is more prolonged, while the heart is not affected, nor the pupil dilated (?Dixon). Solutions keep well.—P.J.i./96,342,412; ii./96,63; i./97,82.

Three per cent. solution is recommended for the cure of tetanus and poisoning by strychnine.—L. ii./05,887.

Sciatica cured by injections.—B.M.J.E. i/05,44.

Urethral Injection. 1 to 2% solutions may be employed to relieve pain.

Relative toxicity of Cocaine and Eucaine. Action of Eucaine is constant, first as a stimulant; it is less toxic than Cocaine, is also a diuretic. Boiling does not affect the efficacy of Eucaine solutions.

Two per cent. aqueous solution very useful in ophthalmic surgery, producing local anæsthesia.—M.P. Aug. 1905.

Incompatible with salicylic acid. Eucaine salicylate may be thrown out of solution—P.J. i./05,267.

Local Infiltration Anæsthesia by **Eucaine** is suitable for very short operations.

Remarkable results have been obtained by this method, notably by Professor Barker.

Powders are prepared for producing the 2 in 1,000 solution of eucaine for infiltration, containing β-eucaine 3 grains (0·2 Gm.) and sodium chloride 12 grains (0·8 Gm.) to produce 3½ ounces (100 Cc. approximately) of solution.

The solution is boiled for a few minutes just before use. A special syringe is employed. A small flask of Jena glass marked on the neck for 100 Cc. is convenient for accuracy and for boiling. In operation 50 Cc. or more of the solution is injected all round the region to be dealt with.

Eucaine and Adrenalin combined should be used for the more serious operations.

Professor Barker employs 10 minims of adrenalin solution (1 in 1,000) added to the 100 Cc. of the boiled eucaine solution. This quantity is usually sufficient for an operation, but occasionally as much as 200 Cc. have been used (=6 grains of eucaine, which is considered a maximum dose). The adrenalin produces a localised anæmia, and so checks hæmorrhage. It also restrains the toxic effects of the eucaine. (This solution is isotonic with the blood. It has been shown that the dose of cocaine capable of killing a rabbit is harmless if combined with adrenalin.)—B.M.J. ii./04,1683.

Nebula Eucainæ Hydrochloridi.

Eucaine Hydrochloride 10 grains, Sodium Sulphate 4 grains, Distilled Water to 1 ounce.

Ophthalmic Lamels are prepared containing $\frac{1}{100}$ and $\frac{1}{50}$ grain of Eucaine Hydrochloride.

'Solubes' Eucaine Hydrochloride, B, 1 and 5 grain, for producing solutions for injection.

In addition to the above powders for producing infiltration solutions,

'Solubes' are prepared, each containing β-Eucaine 0·05 Gm. and Sodium Chloride 0·2 Gm., to be dissolved in 25 Cc. of sterile water to make the solution.

Eudrenine *Syn.* Adreucaine. The name given to a concentrated Solution of β-Eucaine and Adrenalin. Each Cc. contains β-Eucaine $\frac{1}{6}$ grain (0·01 Gm.), and Adrenalin $\frac{1}{2000}$ grain (0·03 mgr.). $\frac{1}{2}$ to 1 Cc. is suitable for an ordinary hypodermic dose, *e.g.*, in dentistry, &c. Dilution with 4 volumes of normal Saline Solution, forms the above injection for Local Infiltration Anæsthesia.

Adreucaine, Sterules Hypodermic. Contain β-Eucaine $\frac{1}{12}$ grain and Adrenalin $\frac{1}{4000}$ grain to 8 minims, $\frac{1}{2}$ Cc., for dental and surgical use. For tooth extraction the contents of one (or two) sterules are injected into the gums ten minutes before operating.

Compressed Tablets of Eucaine are also made containing $\frac{1}{10}$ grain (0·0064 Gm.) for internal administration.

Schleich's Solutions were three (*vide* Schmerzlose Operationen, Schleich, Berlin, 1900). His No. II. containing Cocaine Hydrochloride 5, Morphine Hydrochloride 1, Sodium Chloride 10, water 5,000, is believed to have been finally approved of. His No. I. contained twice as much Cocaine and No. III. one-tenth amount of Cocaine and quarter of the Morphine.

Summing up of anæsthetic methods.—B.M.J.E. ii./05,28.

Unguentum Eucainæ.

Eucaine Hydrochloride 1, Olive Oil 2, Hydrous Wool Fat 7. For pruritus, Menthol 2% may be added.

Holocaine Hydrochloride.

$$CH_3C<\begin{matrix}N.C_6H_4.OC_2H_5\\NH.C_6H_4.OC_2H_5,\end{matrix} HCl = 332{\cdot}21\ (334{\cdot}714\ I.W.)$$

The hydrochloride of para-diethoxyethenyl-diphenyl-amidine, produced by combination of phenacetin and para-phenetidin. In small colourless shining crystals.

Soluble 1 in 55 of water.

One per cent. solution is equal to 2% cocaine solution. As an anæsthetic for operations on the eye, it allows more bleeding, but little or no dilatation of the pupil. Anæsthesia is prompt and lasting, and is not accompanied by mydriasis or disturbance of the accommodation. On account of toxic properties is not adapted for hypodermic use.—L. i./97,1466.

For relief of deep-seated ocular pain claimed superior to cocaine for ocular therapeutics.—M.P., Aug. 1905.

'**Sterules**' of Holocaine Hydrochloride Solution 1% are prepared.

Nirvanin.

$(C_2H_5)_2{=}N.CH_2.CO.HN.C_6H_3.OH.CO.OCH_3HCl$. or $C_{14}H_{20}N_2O_4HCl{=}314{\cdot}33$ (316·698 I. Wts.)

The hydrochloride of a synthetic compound (diethyl-glycocoll-para-amido-ortho-hydrobenzoic methyl ester, hydrochloride), an anæsthetic in small white prisms readily soluble in water. Is very slightly toxic, 7 grains having been injected without injury. Effect is more prolonged than cocaine. It has a powerful antiseptic action, a 1% solution being strongly bactericidal.—P.J. i./99,95, 481; B. & C. D.i./99,1,701; B.M.J.E.i./99,28.

Alypin. *Syn.* **Benzoyl-tetramethyl-diamino-ethyl-di-methyl carbinol Hydrochloride.**

$$\begin{array}{l} \quad CH_2.N<^{CH_3}_{CH_3} \\ C_2H_5{-}C{-}O{-}CO.C_6H_5 \\ \quad CH_2{-}N<^{CH_3.HCl}_{CH_3} \end{array} = 312{\cdot}39\ (314{\cdot}746\ \text{I. Wts.}).$$

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

Crystalline powder melting at 169° C. ***Soluble*** in water 1 in 1 and 1 in 4 Alcohol 90%. Solutions may be sterilised by boiling without injuring anæsthetic action. Solutions 0·025 to 0·5 % or up to 10% (strong solutions keep well, but weak ones may become cloudy), efficient in eye work,—2% strength produces insensibility of cornea in sixty seconds. Is not so toxic as cocaine, but has similar uses. It produces no mydriasis nor disturbance of accommodation.—L. ii./05,321; Pharm. Centralh. — xlvi.,613; B.M.J.E. ii./05,100; comparison with Cocaine, Novocaine, &c.—B.M.J.E. i./06,12.

Alypin Nitras. Introduced as being compatible with silver nitrate.

Orthoform. Methyl ester of Para-amido-meta-oxy-benzoic acid.

$C_6H_3.OH.NH_2.COOCH_3 = 153{\cdot}95$ (155·112 I. Wts.).

'**Orthoform, New,**' now mostly in demand, is the Methyl ester of *Meta*-amido-*para*-oxybenzoic Acid, and is cheaper than the former.

Dose.—$1\frac{1}{2}$ to 3 grains (0·1 to 0·2 Gm.) for cancer and painful ulceration of the stomach.

A white crystalline powder, possessing local analgesic and antiseptic properties. Is slightly soluble in water, in alcohol 90% 1 in 7, and forms a **Hydrochloride** $C_6H_3.OH.NH_2.COOCH_3,HCl = 190{\cdot}14$ (191·570 I. Wts.), soluble about 1 in 9 of water; action of base is more prolonged.

A 10% aqueous solution of the hydrochloride is used, or 10 to 20% with lanoline or paraffin ointment or collodion solution of pure orthoform, or this as a dusting powder may be employed to alleviate pain in sores or burns, but has little action unless there is a breach of surface. Orthoform appears to be non-poisonous, but the hydrochloride is too acid and irritating for ophthalmic or hypodermic use.—L. ii./97,738; B.M.J. i./98,362; B.M.J.E. ii./97,103; P.J. ii./97,277; M.C. Dec. 97,198. Ulcers of larynx.—B.M.J.E. i./99,64. As a local application to ulcers.—B.M.J.i./98,362. Orthoform in glycerin renders painless operations within the uterus.—L. i./98,1434 A kind of necrosis may result from the local application of orthoform.—P.J.ii./99.148e. Drawbacks to its use.—B.M.J.E. i./99,79. Syphilitic headaches improved by insufflations. Relieved whooping cough.—M. 01,45.

Novocain. *Syn.* **Para-Amido-Benzoyldiethyl-Amino-Ethenol Hydrochloride.**

$C_6H_4\ (NH_2)\ [CO_2.C_2H_4N.(C_2H_5)_2]\ HCl = 270{\cdot}66$ (272·648 I. Wts.). *Dose subcutaneously.*—$\frac{1}{5}$ to 1 grain (0·013 to 0·065 Gm.).

A colourless crystalline salt melting at 150° C. Soluble 1 in 1 of water. It is recommended as a useful substitute for cocaine. 0·25 to 2% solutions are for hypodermic use.—C.D. i./06,162.

A powerful local anæsthetic, but is very transient. One drop of a 5% solution produces, when applied to the conjunctiva, an anæsthesia sufficient for superficial operations.—B.M.J.E. i./06,12.

Anæsthesine.—*Syn.* Ethyl ester of para-amido-Benzoic Acid.

$$(p)\ C_6H_4 \begin{cases} -NH_2 \\ \backslash \\ COO\ C_2H_5 \end{cases} = 163{\cdot}89\ (165{\cdot}128\ \text{I. Wts.}).$$

Dose.—5 to 10 grains (0·32 to 0·65 Gm.). in powder or cachets.

Is almost insoluble in water, is soluble 1 in 8 of alcohol 90%, 1 in 50 of Almond Oil and 3 in 100 Olive Oil. Has a numbing taste.

To relieve hyperæsthesia of the stomach, and dyspepsia; local insufflations for pharyngeal and laryngeal

affections, bougies for urethritis 3 grains, and suppositories 10 grains, for hæmorrhoids.—P. J. ii./02,48.

Ointments 10% for burns, eczema, intertrigo.

Local use relieves the pain of inoperable cancer.—B.M.J.E. ii./03,32.

Subcutine. The para-phenol-sulphonate of Anæsthesine. Crystalline white powder, ***soluble*** 1 in 100 water. Used for infiltration in solution 0·8% under the name 'Subcutol.'—L. ii./05,1582; F.N.1906,271.

Lentin. METAPHENYLENE-DIAMINE HYDROCHLORIDE. $C_6H_4.(NH_2)_2.2HCl.$ = 179·72 (181·06 I. Wts.). *Dose.*—½ to 1 grain. Crystalline powder soluble in alcohol and water. In diarrhœa.—F.N. 1906,165.

Stovaine.—*Syn.* ETHYL-DIMETHYL-AMINOPROPINOL HYDROCHLORIDE.

$C(CH_3)\ (C_2H_5)\ (CH_2N\ [CH_3]\ O.CO.C_6H_5.HCl$ = 254·72 (256·642 I. Wts.).

Dose.—$\frac{1}{5}$ to 1 grain (0·013 to 0·065 Gm.). *Maximum dose.*—2 grains.—B.M.J. ii./05,95.

An anæsthetic particularly suited for lumbar anæsthesia. Soluble in water, alcohol and acetic ether. Comparatively non-toxic, bactericidal and vaso-dilating. P.J. ii./04,442,487; Oph., Nov. 04,463; L.ii./04,1848.

Solutions ½ to 1%, rendered sterile by boiling, are used and are said to be equal to cocaine solutions double the strength.

Intraspinal anæsthesia is produced by from 0·02 to 0·1 Gm.—B.M.J. i./06,202, 1086, 1099.

Enuresis treated by 1% injections in the sacral fontanelle.—B.M.J.E. i./06,64.

Tuffer's Solution consists of Stovaine 10% in Sodium Chloride (normal saline) Solution. Ampoules of Stovaine Solution are supplied.—L. i./06,227.

Comparison with Cocaine.—B.M.J.E. ii./05,43.

Stovaine Solution. *Dose.*—For persistent vomiting 5 to 10 minims every 2 hours without either food or drink. Later 3 to 5 minims before a meal.

Stovaine 15 grains, Atropine Sulphate ½ grain, Morphine Hydrochloride 3 grains, Chloroform Water 1 ounce.

Stovaine Ointment for painful wounds and hæmorrhoids.

Stovaine 3 grs., Adrenalin Solution 90 minims, Paraffin Ointment 1 ounce.—P.J. ii./04,809; B.M.J.E. i./05,92.

In ophthalmic surgery 4% solution is a good local anæsthetic.—"Ocular Therapeutics," M.P., Aug. 1905.

For a more complete account of Stovaine *see also* F.N., 1906,262 & P.J. ii./04, 86.

CODEINA (*Off.*). Ph. Ned.

$C_{17}H_{18}(CH_3)NO_3,H_2O$=314·84 (317·224 I. Wts.)

Codeine. *Dose.*—¼ to 2 grains (0·016 to 0·13 Gm.).

An alkaloid from opium or from morphine, in nearly colourless trimetric crystals. Soluble 1 in 80 of water, very soluble in diluted acids, in alcohol 90% 1 in 2, and in excess of aqueous ammonia, but insoluble in excess of potash solution. It is a methylic ether of morphine,—monomethyl-morphine. It has a slightly bitter taste. *Uses.*—In moderate doses is a hypnotic, and in small doses frequently it allays cough in phthisis. In diabetes it lessens the amount of sugar in the urine, beginning with a ¼ grain thrice daily. A useful sedative in chronic cystitis with enlarged prostate.

Thebaine can be converted into codeine by treatment with bromine—loss of one CH_3 group while a bromine atom attaches itself to the adjacent carbon—this base is reduced with hydrogen forming codeinone, obtainable from codeine by oxidation and capable of conversion into codeine by reduction.—B. & C.D. i./06,303; Chem. Zeit., 06,253; P.J. i./06,551.

Codeine and Glycerin Jelly. *Dose.*—1 drachm.

Codeine 72 grains, Citric Acid 720 grains, Refined Gelatin 6 ounces, Glycerin 36 ounces, Oil of Lemon 1 drachm, Balsam of Tolu and Distilled Water of each *q.s.* Boil the Tolu in water as ordered in B.P. for making syrup of tolu; of the liquor so prepared take 30 ounces; in 25 ounces of it soak the gelatin, heat till it is dissolved, and add the glycerin. In the remaining 5 ounces of liquor dissolve the Codeine and citric acid, add the solution to the above, add also the oil of lemon, stir well together, and pour into bottles to 'set.' Useful in chronic laryngitis, phthisical cough, &c. Also in ulcer of the stomach.

Pastillus Codeinæ, T.H. ⅛ grain in each.

Pilula Codeinæ Composita.

Codeine ¼ grain (increased to 2 grains if necessary), Extract of Nux-vomica ½ grain, Extract of Lettuce

$\frac{1}{4}$ grain or more. To make one pill, to be taken two or three times a day, for diabetes. — *Pilula Codeinæ Composita, G.H.*, is Codeine $\frac{1}{2}$ grain, Extract of Cascara Sagrada 2 grains, Kaolin $\frac{1}{2}$ grain, Soap to 4 grains.

Tablets, Compressed, of Codeine $\frac{1}{4}$ and $\frac{1}{2}$ grain.

Trochisci Codeinæ contain $\frac{1}{8}$ grain (0·008 Gm.).

Codeinum Hydrochloricum, P. Austr.

$C_{18}H_{21}NO_3.HCl, 2H_2O = 368\ 91$ (371·6981. Wts.).

Dose.—$\frac{1}{4}$ to 2 grains (0·016 to 0·13 Gm.).

In white crystalline powder, soluble in water.

Broméine (F.N. 1906, 40), is the name given to Codeine Acid Hydrobromide. $C_{18}H_{21}NO_3.(HBr)_2, H_2O = 475·54$ (479·16 I. Wts.).

Dose.—$\frac{1}{2}$ grain (0·032 Gm.). In insomnia.

Codeinæ Phosphas (*Off.*).

$[C_{17}H_{18}(CH_3)NO_3.H_3PO_4]_2,3H_2O = 842·2$ (848·512 I. Wts.); or $C_{18}H_{21}NO_3.H_3PO_4, 2H_2O = 430·0$ (U.S. Formula and Wts.); (433·264 I. Wts.).

Dose.—$\frac{1}{4}$ to 2 grains (0·016 to 0·13 Gm.).

In granular snow-white crystals, soluble 1 in 4 of water. Contains 70% (U.S. 69%) of alkaloid, and is most suitable for hypodermic injection, 1 grain in 6 minims.

Codeinæ Sulphas, U.S. $(C_{18}H_{21}NO_3)_2H_2SO_4, 5H_2O = 780·66$ (780·65 U.S. Wts.); (786·5 + I. Wts.). *Average dose* $\frac{1}{2}$ grain.

Given with advantage in sciatica, $\frac{1}{2}$ to 1 grain.—M. Arch., 1906, 91.

Codeinæ Salicylas, $C_{18}H_{21}NO_3.C_6H_4.OH.COOH = 433·97$ (437·256 I. Wts.). *Dose.*—$\frac{1}{4}$ to 2 grains.

White crystalline powder. Anodyne and hypnotic. Soluble slightly in water, readily in alcohol.

Syrupus Codeinæ (*Off.*).

Dose.—$\frac{1}{2}$ to 2 drachms (1·8 to 7 Cc.).

Codeine Phosphate 40 grains, Distilled Water $\frac{1}{4}$ ounce; dissolve, and add Syrup $19\frac{3}{4}$ ounces.

Ph. Ned. has Codeine Hydrochloride 1, Hot Water 8, Syrup 391.

Tablets, Compressed, of Codeine Phosphate contain $\frac{1}{4}$ grain.

Linctus Codeinæ, G.H. *Dose.*—1 to 2 drachms.

Syrup of Codeine 1, Syrup of Virginian Prune, 1.

St. Th. H. has same strength of Codeine, but different vehicle.

Syrupus Picis cum Codeina, *v.p.* 572.

Methyl-Codeine-Bromide. *Syn.* EUCODEINE.

$C_{17}H_{18}CH_3NO_3.CH_3Br$=391·22 (394.192 I. Wts).

Dose.—$\frac{3}{4}$ grain (0·05 Gm.). Is less toxic than codeine.

COLCHICUM, U.S.

Syn. MEADOW SAFFRON. COLCHICUM AUTUMNALE. (*Liliaceæ.*) (*Off.*)

For the preparations of Colchicum the seed and not the corm should be used.—C.U.D.

The corms are *said* to be $\frac{1}{3}$ weaker in quantity of alkaloid.—Y.B.P. 02,17; about 0·3 to 0·8% is found in both.—P.J. i./04,5, 246.

Colchici Cormus, U.S. 0·35% Colchicine.

Average dose.—4 grains.

U.S. Assay—A weighed quantity of drug in No. 60 powder is shaken with a mixture of ether, chloroform, alcohol and ammonia. A measured quantity of the filtrate is then evaporated to dryness and the residue is dissolved in ether. A small quantity of water is added and the ether evaporated. The aqueous solution, after further purification, is treated with chloroform and the chloroform evaporated, the residue dissolved in alcohol and the residue from evaporation of this solvent is again taken up with ether and water. The ether is evaporated and the aqueous solution treated with repeated quantities of chloroform and evaporated, again dissolved in alcohol which is evaporated and weighed.

Colchici Semen. U.S. 0·55% Colchicine.

Average dose.—3 grains.

Assay—Method similar to above.

Tinctura Colchici Seminum (*Off.*). 1 in 5 of alcohol 45%.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

US. 1 in 10 of alcohol (94·9% volume) and water in proportion of 675 and 250.

Should be 10% strength, prepared by percolation with alcohol 70%.—C.U.D. P. Belg employs this.

A standard of 0·1% Colchicine suggested.—P.J.i./04,5.

Larger equivalent doses of the corm (powdered) than of the tincture often better in gout.—B.M.J. ii./04, 1460; C.D. ii./05,1052.

50% alcohol is the best solvent for the drug.—Farr and Wright, B. & C.D. i./06,275.

Vinum Colchici (*Off.*). 1 of corm in 5 of Sherry.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

Is given in mixtures with alkali and magnesium sulphate. U.S. has Fluidextract of Colchicum Seed 10, Alcohol 15, White Wine 75.

Extractum Colchici (*Off.*). The inspissated juice of fresh corms.

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.).

U.S. orders to be made from dried corm with acetic acid and water, and to contain 1·4% colchicine.

Use —The physiological action of colchicum is said to consist in removing the gouty swelling and congested state of the joints by increasing the activity of the circulation, and so eliminating the obnoxious metabolic products of the disease.—M. 02,46.

Often given in pill with ipecacuanha and mercury.

To abolish the vomiting and diarrhœa often primarily produced (by increase of peristalsis) a small quantity of atropine may be given with it.

A "slow poison," having remarkable action on central nervous system after 3 hours or so.—Dixon.

Powdered Extract of Colchicum of commerce contains 2·5% colchicine.

Fluidextractum Colchici Seminis, U.S. *Average dose.*—3 minims. Standardised to 0·5% Colchicine.

Colchicina.

$C_{15}H_9(O.CH_3)_3\left\{\begin{matrix}NH.CO.CH_3\\CO.OCH_3\end{matrix}\right\} = C_{22}H_{25}NO_6 =$ 396·24 (396·23 U.S. Wts.) (399·24 I. Wts.). (Hertel gives formula $C_{17}H_{23}NO_6$.) *Dose.*—$\frac{1}{150}$ to $\frac{1}{32}$ grain (0·00065 to 0·002 Gm.) in a pill.

This active principle is a yellowish crystalline powder, ***soluble*** in water, alcohol and chloroform, slightly soluble in ether. It is a weak base, most of its salts being decomposed by water. It is the methyl ester of colchicëin, which crystallizes in white needles. Of use in acute gout, rheumatic gout, asthma, cerebral congestion, and uræmia.

Toxic action. It affects the gastro-intestinal mucous membrane, causing severe pains in the bowels, of the nature of colic, vomiting, diarrhœa, intense thirst,

and violent burning in the throat, œsophagus, and stomach.—L. i./03,1254.

Antidotes.

Evacuate the stomach. Give water and demulcents—white of egg, oil, barley water. Apply heat to feet. Stimulants.

Résumé of literature on Colchicum and Colchicine.—Upsher Smith, B. & C.D., i/06, 274.

Colchicine Salicylate.—*Syn.* Colchi-sal.

$C_{22}H_{25}NO_6.C_6H_4OH.COOH = 533{\cdot}25$ (537·288 I. Wts.).

Dose.—$\frac{1}{60}$ grain (0·001 Gm.).

A yellowish powder, soluble in water.

Capsules of Colchicine Salicylate.

Contain $\frac{1}{250}$ grain Colchicine dissolved in methyl salicylate. Used in rheumatism and gout. *Dose.*—One every two hours.

COLLAPSUBES.

These consist of collapsible tubes (of pure tin) containing ointments, creams and lubricants, with catheter attachment for applying to the urethra, and with suitable tubes for the uterus and rectum. For general therapeutic and toilet purposes Collapsubes alone are provided. For complete list *see* Index.

Small size Collapsubes marked * in Index are convenient in ophthalmic surgery. With these a glass rod or camel-hair brush is supplied.

Collapsubes are essentially suitable for introducing ointments into the nose. The patient should put his head well back and press the ointment into the nostrils.

COLLODIUM.

Collodion (*Off.*).—*Syn.* Contractile Collodion.

Pyroxylin 1, Alcohol (90%) 12, Ether (Sp. Gr. 0·735) 36. Keep from naked light. Pure ether answers better. In preparing, solution is more rapid by adding the pyroxylin to the alcohol and afterwards the ether. Acetone is also a good solvent. U.S. has Pyroxylin 4, Ether 75, Alcohol 25.

Pyroxylin (dinitrocellulose $C_6H_8(NO_2)_2O_5 = 250{\cdot}26$ (252·144 I. Wts.) is prepared by the action of nitric and

sulphuric acids on cotton. In making guncotton (trinitrocellulose) $C_6H_7(NO_2)_3O_5 = 294{\cdot}96$ (297·176 I. Wts.), the mixture of acids contains a larger proportion of nitric acid and the time of action is longer. This body is insoluble in a mixture of Alcohol and Ether.

Pyroxylinum, U.S. gives double the molecular formula—$C_{12}H_{16}(ONO_2)_4O_6 = 500{\cdot}48$ U.S. Wts.

Statements have appeared that collodion may be made non-inflammable by mixing with a proportion of carbon tetrachloride, but our experiments showed that even when containing 40% of this it was capable of ignition. Furthermore the product gelatinised and was rendered unsuitable for general use.

Anodyne Colloid.—*Syn.* Amyl Colloid.

Amyl Hydride (*v.p.* 540) ½ ounce, Absolute Alcohol ½ ounce, Aconitine 1 grain, Veratrine 6 grains, Collodion to 2 ounces.

For neuralgia, sciatica, lumbago, all muscular pains, &c. The amyl by its rapid volatilization often produces almost instantaneously the desired result; but should the pain continue the alkaloids can be brought into activity by applying a piece of moist spongio-piline over the collodion film.

Celloidin. — Pyroxylin purified by solution in alcohol and ether (in which it is again soluble). Is used to imbed microscopical specimens and in surgery to close wounds. A solution in acetone is called Filmogen.

Photoxylin is a similar preparation.

Celloidin Solution.

Celloidin 1, Methylated Ether Sp. Gr. 0·720, 3½, Absolute Alcohol 3½, all by weight.

Velvril.

A tough elastic cellulose product, in sheets for surgical purposes. Is made to adhere to the skin by means of Velvril solution.—L. i./03,167; P.J. i./03,266.

Rubber Glove Substitute.

Celloidin 5, Ether 48, Alcohol 46½, Castor Oil ½. Dip the hands in the solution—it soon dries, forms a flexible covering.

To remove, wash with equal parts of alcohol and ether.

Our experiments showed that the formula suggested in B.M.J. ii./04,78 was not sufficiently concentrated.
'New Skin' is a somewhat similar preparation.

Collodium cum Oleo Crotonis.

Croton oil 1 part mixed with 7 parts, more or less as required, of Flexible Collodion, forms a useful counter-irritant; a thin layer painted on quickly dries, and its action is limited to the spot to which it is applied.

Collodium Flexile (*Off.*).

Contractile Collodion 48, Canada Turpentine 2, Castor Oil (by weight) 1; makes a more elastic film than Contractile Collodion. U.S. has Collodion 92, Canada Turpentine 5, Castor Oil 3.

Collodium Elasticum, P. Austr., Ph. Ned.
Collodion 98, Castor Oil 2.

Collodium Cantharidatum, U.S.

Cantharides in No. 60 powder 60, Flexile Collodion 85, Chloroform to 100.

Collodium Iodi.

Iodine 1 (more or less if required) to 15 Flexible Collodion, forms a coating which, on account of the iodine not being so readily volatilized as from an application of the liniment, sustains the action of the iodine and the film protects the part.

Recommended for ringworm and alopecia.

In chilblains and frostbite gives great relief.

Collodium Peruvianum.

Balsam of Peru 1, Collodion 9. Useful for small wounds.—P.J. ii./97,6.

Collodium Salicylicum.

Salicylic Acid 1, Flexible Collodion ($\frac{3}{4}$ strength) 5. For use on exposed parts like the next preparation. U.C.H. has 10 to 60 grains to the ounce of Collodion. G.H. has 60 grains to flexible collodion 1 ounce. **Ph. Ned.** has Salicylic Acid 1, Ether and Spirit (equal parts by weight) 1, Collodion 3.

Collodium Callosum.

Salicylic Acid 8, Extract of Indian Hemp 1, Flexible Collodion ($\frac{3}{4}$ strength) 60. Applied daily, this forms a rapid and painless solvent for corns and warts.

The following more active preparation is similarly used; both preparations have proved useful in epithelioma.

Collodium Salicylicum cum Zinci Chlorido.
Salicylic Acid 2, Zinc Chloride 1, Collodion 15. Forms a clear solution.

Mercuric Chloride to the extent of 1 in 30 or more of Salicylic Collodion may be used to warts of a specific nature.

Collodium Salicylicum et Lacticum.
Salicylic and Lactic Acids, of each 10, Collodion 80. Lactic Acid, being destructive to morbid growths, is said to increase the efficacy of this preparation.

Collodium Stypticum.—*Syn.* **Styptic Colloid.**
Adopted by B.P.C. Absolute Alcohol 10, Benzoin 1. Dissolve, strain, and add Tannic Acid 10, Ether (Sp. Gr. 0·72) 40, Gun Cotton 1. Mix, set aside two or three days, and decant. Useful in checking various forms of hæmorrhage when it can be brought in contact with the bleeding surface.
U.S. has Tannic Acid 20, Alcohol 5, Ether 25, Collodion to 100.

Carbolic Colloid.
Carbolic Acid 20 grains, Styptic Colloid 1 ounce. Readily soluble in anhydrous ether; solution on wool gives sufficient anæsthesia for many small operations. Gives relief in toothache.

COLOCYNTHIDIS PULPA.
Bitter Apple.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).
The dried pulp or pith of the fruit of *Citrullus Colocynthis* (*Cucurbitaceæ*) freed from the seeds. Has a markedly bitter taste, is free from starch, and contains only about 3 to 5 % fixed oil, whereas the seeds contain 15 % or more. Is imported from Smyrna (the best), Austria, France, and Spain.
Uses.—A drastic cathartic. Dangerous in large doses,—is a frequent ingredient in aperient pills. For formulæ *see* Index, "Pills."

Extractum Colocynthidis. U.S. *Average dose*, ½ grain. Made with Diluted Alcohol (U.S.) from seed-free pulp, and reduced to powder. The yield is about 40 to 50%.—Caspari.

Extractum Colocynthidis Compositum. (*Off.*).
Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Colocynth Pulp 6, Extract of Barbados Aloes 12, Scammony Resin 4, Curd Soap in shavings 4, Cardamom Seeds in fine powder 1, Alcohol 60%, 160. Macerate the Colocynth in the Alcohol 4 days, press out the tincture; distill off the Alcohol and add the Extract of Aloes, Scammony Resin and Soap. Evaporate to a firm Extract and add the Cardamoms at the end of the process.

U.S. has Purified Aloes 50, Colocynth Extract 16, Soap 14, Scammony Resin 14, Cardamom 6, Alcohol 10. In fine powder.

Pilula Colocynthidis Composita (*Off.*).
Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Colocynth Pulp 1, Barbados Aloes 2, Scammony Resin 2, Potassium Sulphate ¼, Oil of Cloves ¼, Water *q.s.*

Pulvis pro Pilula Colocynthidis Composita consists of the above less the water. Is more convenient for dispensing.

Pilula Colycynthidis et Hyoscyami. (*Off.*)
Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Compound Colocynth Pill 2, Hyoscyamus Extract 1.

Tinctura Colocynthidis, P.G.
Dose.—3 to 15 minims (0·18 to 0·9 Cc.). (Maximum single dose, 1 Gm.; maximum daily dose, 3·0 Gm.). Strength 1 in 10 alcohol (90%).

Colocynthin. $C_{56}H_{84}O_{23}$ (Walz) = 1116·2 (1124·672 I. Wts.). The active principle, a glucoside, of Colocynth in the form of an amorphous yellow powder. Has been employed as a hypodermic purgative (*vide* also Apocodeine, *p.* 130). *Dose*—15 minims of a 1% solution in Glycerin, approximately ⅙ grain.

Colocynthidin. A resinoid substance not possessing such marked purgative properties as the above.

CONDURANGO CORTEX, P.G.

Dose.—In powder, 15 to 60 grains (1 to 4 Gm.).

The bark of *Gonolobus Condurango* (*Asclepiadaceæ*), from Peru. Is bitter and acrid.

Uses.—Alterative, a supposed specific for cancer, syphilis, and dyspepsia. Is a stomachic and stimulant.

With hydrochloric acid in enuresis.—Med. Rec., Dec. 24, 1904.

Extractum Condurango Liquidum, B.P.C. 1=1. Bark in 60 powder exhausted with 60% alcohol. *Dose.*—10 to 60 minims (0·6 to 3·5 Cc.). Alcohol 45% is a good menstruum.—P.J. i./01,747. **P. Austr.** 1=1 Glycero hydro-alcoholic.

Infusum Condurango. 1 in 20.
Dose.—½ to 2 ounces (15 to 60 Cc.).

Vinum Condurango, P. G. 1 in 10 Sherry. (Fluidextract of Condurango 1, Malaga 9, **P. Austr.**)
Dose.—½ to 1 ounce (15 to 30 Cc.).

CONIUM.

Hemlock (*Off.*).

Both the dried unripe fruits and the fresh leaves and young branches of *Conium maculatum* (*Umbelliferæ*), collected when the fruit begins to form, are official.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.). B.P. does not give. U.S. *Average dose.*—3 grains.

Conine, ethyl-piperidine, methylconine, conhydrine, and pseudoconhydrine are said to be present in conium, and to one or more of these alkaloids the drug owes its medicinal properties. The last mentioned alkaloids are much weaker than the conine.

Assay Method, U.S. Standard 0·5% conine. Conium, 10 Gm. in No. 60 powder is shaken with ether, alcohol and ammonia. An equivalent volume of the liquid is decanted into sulphuric acid, and the ether evaporated from this solvent. Alcohol is added, and the ammonium sulphate formed is then allowed to deposit. Sodium carbonate is then added, leaving the liquid, however, distinctly acid. The liquid is concentrated and the fat removed with ether. The solution is made alkaline with sodium carbonate and washed with successive portions of ether. The ether solution is treated with a few drops of hydrochloric acid, and the solution evaporated at a temperature not exceeding 60° C. and the residue weighed—the factor 0·777 for multiplication (conversion of hydrochloride into base) gives ultimately the proportion of conine.

Conine.—*Syn.* CICUTINE; CONICINE. $C_8H_{17}N$ or

$$\begin{array}{l} CH_2-CH_2 \\ / \quad\quad \backslash \\ CH_2 \quad\quad NH \\ \backslash \quad\quad / \\ CH_2-CH\,(C_3H_7) \end{array} = 126{\cdot}22\ (127{\cdot}176\ \text{I. Wts.})$$

Dose.—¼ grain, increased gradually to 2 grains (0·016 to 0·13 Gm.).

A liquid alkaloidal principle, almost colourless, and

having a penetrating empyreumatic odour, obtained from hemlock. The different parts of the plant vary in alkaloidal content at different stages of development. —P.J. i./04,186. It is slightly soluble in water. Has been prepared synthetically from *a*-Picoline,

$$C_5H_4(CH_3)N = 92{\cdot}4 \ (93{\cdot}096 \text{ I. Wts}),$$

and is chemically *a*-normal-propyl-piperidiae. Commercial Conine has in combination two other principles, Conhydrine $C_8H_{17}NO = 142{\cdot}1$ (143·176 I. Wts.), and Methyl Conine $C_8H_{16}(CH_3)N = 140{\cdot}13$ (141·192 I. Wts.), which Conine Hydrobromide is free from.

The alkaloid was prepared synthetically by Ladenburg.

Soluble in alcohol in all proportions, and about 1 in 80 in water.

Conium fruit contains 0·36 to 0·91% of Conine. A standard of 0·5% is suggested.—P.J. i/04,5. The fruit contains more than the leaves. Test to distinguish between Conine Nicotine and Sparteine.—P.J. ii./05,333.

Coninæ Hydrobromidum.

$$C_8H_{17}N.HBr = 206.57 \ (208{\cdot}144 \text{ I. Wts.})$$

Dose. —$\frac{1}{3}$ grain, increased to 2 grains (0·02 to 0·13 Gm.).

In colourless crystalline prisms, resembling magnesium sulphate in appearance. Soluble in water, 1 in 2, nearly.

Injectio Coninæ Hydrobromidi Hypodermica. 1 grain in 20 minims.

Dose.—1 to 3 minims (0·06 to 0·18 Cc.).

Pessus Coninæ (Hosp. for Women, Soho Square).

Conine $\frac{1}{2}$ minim, Gelatin Mass 20 grains.

Pilula Coninæ Hydrobromidi.

Conine Hydrobromide $\frac{1}{3}$ grain (0·02 Gm.) in each.

Incompatibility.—Conium preparations are incompatible with alkalis and preparations containing tannin.

Antidotes.—Stomach tube and emetic. Give tannic acid and wash out the stomach again. Stimulants artificial respiration.

Uses.—Conium and conine hydrobromide act as direct sedatives to the respiratory centre; in poisonous doses death is caused by asphyxia. Employed with advantage in all spasmodic affections, especially for whooping-cough and asthma; in neuralgia, epilepsy and as sedative in acute mania.

Conine is rapidly excreted by the urine.—Dixon.

Tinctura Conii (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Conium Fruit No. 40 powder, 1 in 5 of Alcohol 70% by percolation. A standard content of 0·1% of Conine is suggested.—P.J. i./04,5.

Vapor Coninæ. B.P., 1885.

Juice of Hemlock 4, Solution of Potash 1, Distilled Water 8. Inhale about 20 drops from a suitable apparatus as laryngeal sedative. The alkali is added to liberate the conine.

Extractum Conii Liquidum, B.P.C.

Dose.—5 to 15 minims.

Conium Fruit is exhausted with alcohol 60% containing 10% of acetic acid, the last portion of percolate concentrated and mixed with that first part set aside so as to produce a Liquid Extract which shall contain 1% of alkaloids.

Fluidextractum Conii, U.S.

Average dose.—3 minims (0·2 Cc.).

Standardised to 0·45 Gm. Conine in 100 Cc.

Succus Conii (*Off.*) *Dose.*—1 to 2 fluid drachms (3·5 to 7·0 Cc.) Fresh Juice 3, Alcohol (90%) 1. Useful in chorea.

Unguentum Conii, Conium Ointment (*Off.*).

Conium Juice 88, evaporated under 140° F. to 11, Hydrous Wool Fat 33. Mix.

Anhydrous Wool Fat gives better results as by the following method:—Evaporate the Conium Juice 2 ounces to ½ ounce weight and incorporate with Anhydrous Wool Fat ½ ounce in a warmed mortar.—C.D. i./05,709.

Gives relief in pruritus ani, and for painful fissures.

CONVALLARIA MAJALIS (*Liliaceæ*).

Lily of the Valley.—(Entire plant).

U.S. has dried rhizome and roots.

Two glucosides have been obtained from the plant; Convallarin $C_{34}H_{62}O_{11}$ (Walz) = 641·62 (646·496 I. Wts.) a purgative, *dose* 3 to 4 grains; and Convallamarin $C_{23}H_{44}O_{12}$ (Walz) = 508·49 (513·352 I. Wts.) a hear tonic, *dose* ½ to 2 grains.—P.J. 1882,423; L. ii./84, 418; B.M.J.E. ii./91,142.

Convallamarin useful in preventing arrest of circulation in chloroform narcosis.—P.J. i./98,471.

The juice of the plant found to contain 0.45 % Convallamarin and 0.12 % Convallarin.—P.J. ii./04, 967.

Tinctura Convallariæ, B.P.C.

Dose.—5 to 20 minims (0·3 to 1·2 Cc.); 1 of flowers in 8 of Alcohol 60%.

Uses.—An old remedy for dropsy, being a powerful diuretic, irregularity of heart's action is lessened, used in mitral and aortic regurgitation, dilatation of the heart, senile hypertrophy, chronic pericarditis, anæmia, and diabetes.

It is of great service where there is actual valvular lesion, with insufficiency and dilatation of the right side of the heart, venous engorgement, and œdema. Should not be used where opposite conditions exist.

Convallaria has special influence on nervous palpitation and tachycardia.—B.M.J. ii./92,1156.

Extractum Convallariæ. An aqueous extract.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Convallaria extract 1 grain with Convallaria powder 1 grain, make a pill.

Fluidextractum Convallariæ, U.S.—*Average dose*—8 minims. (0·5 Cc.).

1 = 1 of dried rhizome and roots. Flowers preferred to roots, as latter contain little glucoside.—P.J. ii./99,622.

Better than digitalis or strophanthus in controlling pulse rate (in exophthalmic goitre).—B.M.J. ii./05, 1249.

Glyco-Gelatin Pastils of Convallaria contain 2 minims of tincture. They dissolve slowly and are hence very useful for prolonged cardiac action.

COTO CORTEX.

Dose, in powder, 1 to 8 grains (0·065 to 0·52 Gm.) 4 to 6 times a day. Is imported from Bolivia. Source unknown, probably from *Lauraceæ* or *Monimiaceæ*.

Uses.—For cholera, and especially the diarrhœa of phthisis and night sweats, and for gout and rheumatism. It is rich in resinous principles which give it a pungent taste.

To distinguish true from false Coto bark.—P.J. ii./05,580. ***Incompatible*** with Mistura Cretæ.

Extractum Coto Liquidum. 1 = 1 of bark.

Dose.—2 to 6 minims (0·12 to 0·35 Cc.).

Tinctura Coto, B.P.C.

Coto Bark, bruised 1, Alcohol (90%) *q.s.* to 10.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.), every 2 hours, with mucilage and syrup to suspend.

Cotoin. $C_{14}H_{12}O_4$ or $C_6H_2\begin{cases}(OH)_2\\O.CH_3\\CO.C_6H_5\end{cases}$ = 242·26 (244·096 I. Wts.)

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) every 2 or 3 hours in pill or diluted mucilage.

Cotoin, a bitter principle, is in yellow crystalline powder, slightly soluble in water, soluble in alcohol. The dust is irritating to the nostrils.

Fortoin.—*Syn.* METHYLENEDICOTOIN.

$CH_2(C_{14}H_{11}O_4)_2$=496·43 (500·192 I. Wts.).

Dose.—4 grains (0·25 Gm.).

A formaldehyde compound of Cotoin. A crystalline powder insoluble in water, sparingly soluble in alcohol. Soluble in chloroform and in acetone. Is decomposed by alkalis. Used for dysentery and phthisical diarrhœa. —B.M.J. i./00,1092; P.J. i./00,531.

Paracotoin. $C_{12}H_8O_4$=214·44 (216·064 I. Wts.).

From the allied Paracoto Bark.

Dose.—1½ to 3 grains (0·01 to 0·02 Gm.) in chronic and acute stomachic catarrh and Asiatic cholera.

Similar to cotoin in appearance. Soluble in ether, chloroform, only slightly in alcohol or water.

COUMARINUM.

$C_6H_4\begin{cases}O-CO\\\quad|\\CH=CH\end{cases}$ or $C_9H_6O_2$ = 144·95 (146·048 I. Wts.)

Ortho-oxycinnamic anhydride.

A neutral crystalline principle with aromatic odour and burning taste, may be obtained from Tonka or Tonquin beans, the fruit of *Coumaruna odorata*, and is found in the Woodruff, but is now manufactured synthetically from Salicylic Aldehyde.

Soluble in alcohol, ether and oils, but not to any extent in water. Sublimes unchanged. One part will disguise the odour of 50 of iodoform.

Vide also Acidum Coumaricum.

CREOSOTUM (*Off.*).

Kreosotum, P. Austr.

Dose.—1 to 5 minims (0·06 to 0·3 Cc.), increased to 30 or even 60 minims, in capsules, or in cod liver, almond, or olive oil, or emulsified.

Soluble in alcohol, chloroform, ether, glacial acetic acid, fats and oils, and 1 in about 150 of water.

Two kinds of genuine Creosote are met with in commerce—one from **Pinewood**, which is anhydrous and mixes perfectly with oil of turpentine, consisting chiefly of creosol $C_6H_3.CH_3.OCH_3.OH$: 1, 3, 4 = 137·04 (138·08 I. Wts.) homopyrocatechin - methyl - ether (Morson's 'Creosote' is representative of this class). Glycerin is miscible with Morson's Creosote in all proportions up to 2 of Glycerin to 1 of Creosote. Upon further addition of glycerin the mixture becomes turbid. Morson's Creosote does not cause collodion to gelatinise; the other variety is principally from **Beechwood**, which contains Guaiacol, $C_6H_4.OCH_3$ OH = 123·13 (124·064 I. Wts.) and is more soluble in water. The latter is now made official with Sp. Gr. not below 1·079. According to *Codex Supp.* a good creosote should contain 20% of guaiacol with 40% of creosol and 40 of monatomic phenols, which latter should contain about 15% of cresylols. It rotates the plane of a ray of polarized light to the right (not *left* B.P.), or is inactive (Umney).

Morson's Beechwood Creosote mixes to form a clear liquid with glycerin in all proportions. Such a clear solution exposed to the air becomes turbid.

Creosote, unlike phenol, mixed with an equal volume of collodion does not gelatinise.

Uses.—Locally as a caustic. It is one of the most powerful deodorisers, antiputrescents, and antiseptics. It is used to correct fetor, given to check sickness, added to cod-liver oil for phthisis, and applied externally in various skin diseases, and is put into the cavities of carious teeth.

Is given to check gastric fermentation and as an intestinal antiseptic in some forms of diarrhœa.

In bronchiectasis creosote vaporised in closed room.—Scot. Med. & Surg. Jl., June, 1904.

For irritable trachea and congested larynx, causing troublesome cough, the dry inhalation of creosote from an oro-nasal or 'ozonic' inhaler is very useful.

Incompatible with silver oxide (*see* Pill). Also with calcined magnesia and slaked lime.

Aqua Creosoti, U.S. *Average Dose.*—2 drachms.
Creosote 1 in 100 water freshly prepared.

Elixir Creosoté (Codex). Creosote 15, Rum 985.
Dose.—1 to 4 drachms (3·5 to 15 C.c.).

Haustus Creosoti. Vic. Park.
Dose.—1 ounce (30 Cc.).
Creosote 5 to 30 minims, Compound Tincture of Gentian 15 minims, Alcohol (90%) 15 minims, Liquid Extract of Liquorice 30 minims, Water to 1 ounce.

Injectio Creosoti, C.L.T.E.
Creosote 1 to 4 drachms, Liquid Paraffin to 1 ounce; (does not form a solution), and

Injectio Creosoti Composita, C.L.T.E.
Creosote 1, Oil of Wintergreen 1, Almond Oil 1, Castor Oil 5, introduced into the larynx and trachea by means of an intra-laryngeal syringe.
A 10% solution in Sterilised Oil (*v.p.* 122) is also used for hypodermic injection.

Mistura Creosoti (*Off.*).
Dose.—½ to 1 ounce (15 to 30 Cc.).
Creosote 1, Spirit of Juniper 1, Syrup 30, Distilled Water to 480.

Oleum Morrhuæ cum Creosoto.
Dose.—1 to 4 drachms (3·5 to 15 Cc.). Contains 1½%.

Pautauberge's Solution.
A proprietary article containing Calcium Hydro-chloro-Phosphate with Creosote.
Dose.—A tablespoonful (containing 2 minims of Creosote and 8 grains of the above salt).

Perles of Creosote. 1 or 3 minims in each, with oil, also **Capsules**, 3 and 5 minims, or more, with oil.

Creocarb Capsules. Contain Beechwood Creosote 3 minims and Phenol ¼ gr. In the treatment of phthisis.

Pilula Creosoti (Martindale).
Dose.—2 to 6 grains (0·13 to 0·4 Gm.).
Creosote 1, Curd Soap, in powder 1.
Put the Creosote in a wide mouth stoppered bottle,

add the soap, and mix well. Then digest on a water-bath till they combine. Care should be taken not to mix oxide of silver directly with pure Creosote, or deflagration will occur; but it may be mixed with the above mass, although it is not advisable to prescribe the two drugs together. P.G. iv. orders Creosote 10, Liquorice 19, Glycerin 1, made into pills of 15 centigrammes, containing about 1 minim of Creosote, and rolled in Cinnamon Powder.

Japanese soldiers carry creosote as prophylactic against dysentery.—B.M.J. i /04,1327.

Spiritus Creosoti.

Dose.—1 drachm. Creosote 1, Alcohol 90% 40. Lessens cough and expectoration in chronic bronchitis and phthisis.

Unguentum Creosoti (*Off.*).

Creosote 1, Hard Paraffin 4, Soft Paraffin, white, 5.

Unguentum Creosoti Forte, B.S.H.

Creasote 6 drachms, Yellow Wax 180 grains.

Melt, and stir till cold. Used in psoriasis. Caution.—Should not be applied to the belly, face, or flexor surfaces of the limbs.

Vapor Creosoti, T.H.

Creosote 80 minims, French Chalk 30 grains, Water to 1 ounce. C.L.T.E. has Creosote 40 minims, Light Magnesium Carbonate 20 grains, Water to 1 ounce.

A teaspoonful in a pint of water at 140° F. Useful in chronic congestion of the larynx and trachea, and in ozœna, fetor of breath in bronchitis, gangrenous lung, and syphilitic throats.

Creosote is unsurpassed as a curative agent in tuberculosis of the lung. Treatment must be continuous and extensive. Best results follow from greatest amount borne by patient. Best given in cod-liver oil or milk, or by rectal injection in the latter. Intra-pulmonary and inter-tracheal injections questionable, if not injurious.

Useful in pills for diabetes.—L. i./89,702.

Of service in flatulent dyspepsia, $\frac{1}{2}$ minim with sodium bicarbonate after meals. If due to gastric atony, bismuth carbonate and pepsin, of each 2 grains may be added.—Th.Gaz. July, 1889,504.

Case of poisoning by creosote—two doses of over $\frac{1}{2}$

drachm taken within a short time. Recovery with no ill effects.—B.M.J.E. ii./92,4.

Is said to produce hæmoptysis.—B.M.J. ii./01,286.

Oro-nasal Inhalations.—Creosote, or a mixture of equal parts of Creosote and Phenol, is employed to medicate respirators for phthisis.

It is more sedative in its action if mixed with an equal volume of spirit of chloroform, 5 to 15 or 20 minims dropped on the cotton wool at one time.

Solutio Creosoti Composita, Brompton H.

Creosote 1, Spirit of Menthol (20%) 1, Spirit Chloroform 1, for inhalation.

Creosote Carbonate.—*Syn.* CREOSOTAL. **Kreosotum Carbonicum, P. Austr.** A clear light-brown viscous liquid, almost odourless and tasteless, insoluble in water, soluble in oils; is prepared from beech creosote, and contains the carbonates of guaiacol and creosol. Is said to disagree less than creosote, and has been used in tuberculosis. Breaks up internally into creosote and carbonic acid. *Dose.*—5 to 20 grains (0·32 to 1·3 Gm.), or considerably increased.—P.J. 1893,686; B.M.J.E. i./96,15.

For phthisis—L. i./98,960. For bronchitis.—L. ii./99,711. Pneumonia curable by.—L. i./01,646.

Capsules of Creosotal contain 5 and 10 minims.

Creosote Phosphate.—*Syn.* PHOSOTE.

$(C_6H_7)_3PO_4(?)=329·7$ (332·168 I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

The creosote ester of ortho-phosphoric acid, a yellowish oily liquid, with little odour, taste bitter, insoluble in water, soluble in alcohol. **Taphosote**—*dose*, 20 to 40 grains is the tanno-phosphoric-ester of creosote.

Creosote Phosphite, Creosote-Phosphorous-Ether.—*Syn.* PHOSPHOTAL.

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

In glacial crystals, used as a substitute for Creosote.

Creosote Valerianate.—*Syn.* EOSOTE.

Dose.—4 to 12 grains (0·26 to 0·8 Gm.).

An oily liquid, soluble in alcohol, glycerin and ether; checks gastric fermentation and used for phthisis epidermically. Is not so toxic or corrosive as creosote.

Capsules, each containing 7 minims, are prepared.

Oleocreosote, a pale brown oily liquid, an oleic ether of creosote, of which it contains about one-third, is said to be easily assimilable. Antiseptic and disinfectant. *Dose.*—10 to 30 minims (**0·6 to 1·8 Cc.**) in capsules.

Creosoform, a combination of creosote with formaldehyde, in greyish powder, is found to be a methylene derivative (of guaiacol).

Guaiaform (Geoform), a combination of guaiacol with formaldehyde, is a brownish-yellow powder. Antiseptic. ***Soluble*** in 90% alcohol, but not in water.

Guæthol.—*Syn.* **Ajacol.** PYROCATECHIN-MONO-ETHYL-ESTER, $C_6H_4OC_2H_5OH$=137·04 (138·081 I.Wts.) An oily liquid, or purer in crystals resembling thymol or phenol, insoluble in water. Allays pain by direct application.—P.J. i./98,367,504b.

Guaiacol. $C_6H_4\begin{Bmatrix}OCH_3\\OH\end{Bmatrix}$=123·13 (124·064 I.Wts.).

Dose.—1 to 5 minims (**0·06 to 0·3 Cc.**). U.S. has *average dose* 8 minims.

Medicinal Guaiacol is a colourless refractive liquid, and the principal constituent of beech creosote, but pure guaiacol is now prepared synthetically from pyrocatechin in colourless prismatic crystals melting from 83 to 91° F. The reputation obtained by guaiacol having been created by the use of the liquid, *the crystals are only dispensed when so ordered.* The crystals are **P. Belg.**

Solubility.—Both forms are soluble in alcohol, ether, fats, oils, and glycerin, and slightly in water, with taste and odour resembling, but more agreeable than, those of creosote.

Uses.—In phthisis, particularly in incipient stages, and rarely disagrees. Is given in dose of 1 to 5 minims in oily solution in capsules, or in cod liver oil, which disguises the taste, or the following:—Guaiacol 13·5, Tincture of Gentian 30, Alcohol (90%) 250, and Sherry to 1,000; two teaspoonfuls two or three times a day in water—or in Mistura Guaiacol, *vide infra.*

Guaiacol is also used externally, being rubbed into the skin or painted on the skin which is then protected by oiled silk; begin with 10 minims and increase to 30 or more; do not cover more than the space of the palm of a hand at a time. Useful for phthisis and typhoid.

Guaiacol (Synthetic) 1, with Menthol 1, and Cam-

phorated Oil 30, used as an application for facial erysipelas; paint every two hours.—P.J. ii./00,650.

Mistura Guaiacol, G.H.

Guaiacol 4 minims, Alcohol (90%) 40 minims, Glycerin 30 minims, Oil of Cinnamon 1 minim, Water to 1 ounce.

Perles of Guaiacol contain 1, 2 or 3 minims, dissolved in oil. **Capsules** contain five minims.

Pilula Guaiacol 1 to 3 grains (crystal) require $\frac{1}{6}$ grain compound tragacanth powder with glucose syrup to mass.

Injections of Guaiacol 5%, and iodoform 1%, in sterilised olive oil, *v.p.*122, recommended in tuberculosis; said to lessen cough and expectoration, diminish number of bacilli in sputum, favour cicatrisation of cavities, and lessen fever and night-sweats. *Dose.*—One, increased to three syringefuls (1 Cc. each).

A dangerous state of collapse has followed hypodermic injection of guaiacol on several occasions.—L.i./98,222.

No advantage in hypodermic treatment over that by mouth; good results only follow continued use.—Five minims in capsules, up to 60 minims in glycerin emulsion, after meals, followed by a drink of milk.—L.i./98,993.

Durant's Injection. Guaiacol 5, Iodine 1, Potassium Iodide 10, Sterile Olive Oil 100. Injected in pulmonary phthisis.—B.M.J.E. ii./04,96.

Vapor Guaiacol Compositus.

Guaiacol and Terebene of each 2, Menthol and Thymol of each 1, Spirit of Chloroform 3. Inhale 5 to 10 minims from an inhaler night and morning. Employed in phthisis.

Orchitis, ointment of guaiacol with vaseline, 1 in 10 useful.—B.M.J.E. ii./95,56; P.J. ii./95,471; and for mumps by 5% ointment.—B.M.J.E. ii./03,83.

Guaiacol Benzoas, Guaiacol Benzoate.—*Syn.* BENZOSOL. The benzoyl-ester of guaiacol. $C_6H_4.OCH_3.O.CO.C_6H_5 = 226{\cdot}38$ (228·096 I. Wts.).

Dose.—4 to 12 grains (0·26 to 0·8 Gm.) in cachet.

In small crystals, almost tasteless and odourless, nearly insoluble in water. Useful in incipient phthisis (especially the diarrhœa of), and in diabetes mellitus.

Tablets, 5 grains. *Dose.*—1 or 2.

Guaiacol Camphorate.—*Syn.* GUAICAMPHOL.

$[C_6H_4.OCH_3.O]_2(CO)_2C_8H_{14}$ or $C_{24}H_{28}O_6=409{\cdot}12$ (412·224 I.Wts.).

Dose.—5 to 10 grains in cachets or 5-grain tablets.

A compound of Guaiacol and Camphoric Acid, soluble only very slightly in alcohol, insoluble in water; controls night-sweats and diarrhœa of phthisis.—C.D.ii./99,122.

Guaiacol Carbonas, U.S., P. Austr., Ph. Ned., P. Belg.—*Syn.* DUOTAL.

$CO\begin{cases}O.C_6H_4.OCH_3\\O.C_6H_4.OCH_3\end{cases}$ or $C_{15}H_{14}O_5=272{\cdot}05$ (274·112 I. Wts.).

Dose.—3 to 8 grains (0·2 to 0·52 Gm.), gradually increased to as much as 100 grains per diem, in cachets.

Made by action of carbonyl chloride on sodium-guaiacolate.

A white minutely crystalline substance, tasteless, and with slight odour, soluble in alcohol about 1 in 80, but soon crystallises out again with drop of temperature, insoluble in water. Contains 91·5 % of guaiacol. Given in phthisis, improves appetite, increased weight, and lessened cough, expectoration, and night-sweats, also in typhoid and for bronchitis.

Rheumatoid arthritis, especially the chronic and sub-acute forms, best treated by Guaiacol Carbonate 5-10 grain doses in cachet, increased—with Potassium Iodide. Relieves the pain and diminishes size of joints.—Pr., July, 1905. L. i./05,718.

Pneumonia 20 to 30 grain doses every 1 or 2 hours. B.M.J. ii./04,1752.

Tablets, 5 grains (0·32 Gm.).

Guaiacol Cinnamate.—*Syn.* STYRACOL.

$C_6H_4\begin{cases}O.CH_3\\O.C_9H_7O\end{cases}$ or $C_{16}H_{14}O_3=252{\cdot}2$ (254·112 I. Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In white granular crystals, insoluble in water. For intestinal phthisis and vesical catarrh.—P.J. ii./04,590.

Said to split up into its constituents in the system.—B.M.J. i./05,311.

Guaiacol Phosphate. $(C_6H_4.OCH_3.O)_3PO=413{\cdot}07$ (416·168 I. Wts.).

Dose.—1½ to 3 grains (0·1 to 0·2 Gm.).

White crystalline powder. Insoluble in water, but soluble in 90 % alcohol. Used in phthisis and typhoid.

Guaiacol Phosphite. — *Syn.* GAIACO-PHOSPHAL.

Dose.—6 to 10 grains daily (0·4 to 0·65 Gm.).

In white glistening crystals, soluble in alcohol, slightly so in water. Has been recommended for tuberculosis.

Guaiacol-Salol, Guaiacol Salicylate.

$C_6H_4OCH_3.O.CO.OH.C_6H_4$ = 242·26 (244·096 I. Wts.).

Dose.—15 to 75 grains (1 to 5 Gm.) daily in cachets.

In white shining crystals, insoluble in water. Useful in phthisis and as an intestinal antiseptic.

Guaiacol Valerianas. *Syn.* GEOSOTE.

$C_6H_4.OCH_3.O.CO.C_4H_9$ or $C_{12}H_{16}O_3$ = 206·56 (208·128 I. Wts.).

Dose.—2 to 5 minims (0·12 to 0·3 Cc.) in capsule.

A liquid combination of guaiacol and valerianic acid, having the characteristic odour of the latter. Useful in tuberculosis and chlorosis.—P.J. i./97,425.

Guaiacetin, Sodium Pyro-catechin-mono-acetate. $C_6H_4.OH.O.CH_2.COONa$ = 188·68 (190·106 I. Wts.) *Dose.*—8 grains (0·52 Gm.).

A carboxyl substitution product of guaiacol. A white powder, insoluble in water, used for tuberculosis like guaiacol carbonate. Said to cause no gastric disturbance. —P.J. ii./96,215,290; B.M.J.E. ii./96,11.

Histosan. A combination of guaiacol and an albumin. In powder form. *Dose.*—3 to 7½ grains. Also in syrup.

For same purposes as guaiacol.—B.M.J.E.i./06, 12.

Guaiasanol. *Syn.* DIETHYLGLYCOCOLL-GUAIACOL.

Dose.—10 to 60 grains (0·65 to 4 Gm.).

Soluble in water. Checks tuberculous diarrhœa. Is a deodoriser for ozœna, nose, mouth and cancerous wounds; 1 in 2000 solution used for antiseptic irrigation of the bladder.

Piperidinæ Guaiacolas. *Syn.* GUAIPEROL.

$[C_6H_4.OH.OCH_3]_2C_5H_{11}N$ or $C_{19}H_{27}O_4N$ = 330·75 (333·256 I. Wts.).

Dose.—5 to 30 grains (0·32 to 2 Gm.).

A compound prepared by the action of piperidine on guaiacol, in granular colourless crystals with slight creosote odour, soluble 1 in 30 of water, freely in alcohol; solutions are decomposed by mineral acids and alkalis. Useful in phthisis; may be given in solution flavoured with chloroform or syrup of orange.

Thiocol. Potassium-guaiacol-sulphonate.

$C_6H_3(OCH_3)OH.SO_3K = 240{\cdot}42$ (242·266 I.Wts.).

Dose.—15 grains (1 Gm.) thrice daily.

In odourless white crystals, soluble in water, 1 in 6, slightly in alcohol. Contains about 60% of guaiacol.

Has been recommended in phthisis. Large doses may be given.

For intestinal catarrh.—P.J. ii./01,645.

CUBEBA, U.S. (*Off.*)

Dose.—30 to 60 grains (2 to 4 Gm.) in cachets.

The dried unripe full-grown fruit of *Piper Cubeba* (*Piperaceæ*). The genuine—imported from Java—give a crimson colour with sulphuric acid, and are free from mace-like taste and odour.—P.J. 1892,771,121.

A content of 22% Oleo-Resin suggested as a standard. —P.J. ii./02,496.

Spurious fruit on the market probably *P. Ribesoides.* —C.D.ii./05,797,

Cigarettes of the powder are useful for catarrh and excessive bronchial secretion. It is sometimes added to Ferrier's Snuff, *q.v.*, and is an ingredient of the American specialty, Brown's Troches. Cubebs contain:—

Oleum Cubebæ, (*Off.*), U.S. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

Colourless, pale green or greenish yellow oil, with camphoraceous odour and taste characteristic of Cubebs. Sp. Gr. 0·910 to 0·930. Soluble 1 in 20 in alcohol 90%.

Cubebin, $CH_2\langle{}^{O}_{O}\rangle C_6H_3C_3H_4OH = 176{\cdot}74$ (178·08 I. Wts.), in small white needles, and **Cubebic Acid**, $C_{14}H_{16}O_4(?) = 246{\cdot}26$ (248·128 I.Wts.), a non-crystalline resin, occurring in white powder, which has been recommended for gonorrhœa, in doses up to 15 grains (1 Gm.).

Oleo-resina Cubebæ (B.P. 1885).

Dose.—5 to 30 minims (0·3 to 1·8 Cc.).

U.S. by alcohol extraction. Deposits on standing: the waxy crystalline matter is to be rejected.

Capsules of Cubeb Oil contain 10 minims. For combinations (*v.p.* 519). Used in bladder and urethral troubles.

Fluidextractum Cubebæ, U.S.

Average dose.—15 minims (0·9 Cc.) 1=1, Alcoholic Percolate.

Tinctura Cubebæ, 1 in 5 Alcohol (90 %), (*Off.*). *Dose.*—½ to 2 drachms. In chronic bronchitis as an expectorant, taken in linseed tea.—L. i./90,569.

Trochisci Cubebæ, T.H. Contain ½ grain each, with fruit paste. *Dose.*—1 every 3 or 4 hours.

Vapor Cubebæ cum Limone, T.H. Cubeb Oil ½ drachm, Oil of Lemon 10 minims, Light Magnesium Carbonate 20 grains, Water to 1 ounce. Ha stimulating effect in chronic bronchitis.

CUCUMIS.

Cucumber.—The juice of the fruit of *Cucumis sativus*, is in French Codex to prepare:—

Unguentum Cucumeris.—*Syn.* Fr. POMMADE AUX CONCOMBRES.

Cucumber Juice 1200, Lard 1000, Veal Suet 600, Balsam of Tolu in Alcohol 90% *q.s.*, 2, Rose Water 10. Is a cooling ointment, used like cold cream.

CUPRUM.

Cu = 63·12 (63 6 I. Wts.).

For purifying water Kraemer found that strips of copper foil placed in water containing colon and typhoid bacilli completely destroyed same in less than four hours,—controls, on the other hand, multiplied even for sixty days. Considered a safe domestic method. A piece of copper foil 3⅕ inches square in a quart of water six hours or so is all that is necessary.—B.M.J.E. i./05,43; Amer. Med., Feb. 18, 1905; Am. Jl. Phcy., June 05,265.

He gives a table of figures showing the amount of copper normally present in a number of substances in mgr. per kilo:—Belladonna contained 4,200, Henbane 3,600.—Am. Jl. Phcy., June 05,274.

Antidotes to Copper Salts.—Stomach-pump, emetics, white of egg and milk. Hot fomentations to the stomach, barley water, morphine or laudanum to relieve pain.

Incompatibles.—Alkalis and alkaline carbonates, also preparations containing tannin and iodides.

Cupri Acetas Neutrale, $(CH_3\ COO)_2\ Cu, H_2O$ = 198·16 (199·664).

Dose.—$\frac{1}{12}$ to $\frac{1}{2}$ grain (0·0054 to 0·032 Gm.).

Dark green crystals. Applied to ulcers acts as a stimulating caustic. ***Soluble*** 1 in 15 approximately of water; only slightly in alcohol.

In tuberculosis has been given with Sodium Phosphate 1 grain, Tragacanth Mucilage $\frac{1}{2}$ ounce, or as :—

Pilula Cupri Acetatis, $\frac{1}{6}$ grain in each with Sodium Phosphate 1 grain, Liquorice Powder and Glycerin *q.s.*

Cuprocitrol. A speciality consisting of a 10% ointment of this salt for use in ophthalmic treatment.

Cupri Subacetas. *Syn.* **Verdigris, Aerugo.**

Is usually of indefinite composition, principally $[(C_2H_3O_2)_2Cu+CuO+6H_2O]$=366.56(369·344 I.Wts.) and only partly soluble in water. Occurs in greenish partly crystalline powder.

Linimentum Æruginis. Ph. Lond.

A decoction of verdigris, vinegar and honey.

Simple syrup would be preferable to the honey to obviate possible deposition of cuprous oxide in making. Was used to indolent ulcers and exuberant granulations, and is still employed in veterinary work.

Cupri Phosphas

$Cu_3(PO_4)_2+3H_2O$=431·64 (434·848 I. Wts.).

A blueish green powder prepared by precipitating copper sulphate solution with sodium phosphate.

Hypodermic use of Copper Salts.—Copper Phosphate 5, Glycerin 30, Water 30, or Copper-Ammonium Acetate, 1 in water 100; of either of these 1 Cc. is injected once every two weeks in cases of chronic phthisis.—M. Arch., 1905,27 (ex Bull. Gen. de Therap.).

Cupri Sulphas (*Off.*) **U.S.**

$CuSO_4, 5H_2O$ = 247·86 (249·74 I. Wts.)

Average Dose.—$\frac{1}{4}$ to $\frac{1}{2}$ grain (0·016 to 0·032 Gm.); *Off.*—as astringent $\frac{1}{4}$ to 2 grains(0·016 to 0·13 Gm.); as emetic 5 to 10 grains (0·32 to 0·64 Gm.).

Blue Crystals. ***Soluble*** in water 1 in $3\frac{1}{2}$, in glycerin 1 in 2 (but may crystallise out again); insoluble in alcohol.

Uses.—Given internally in very small doses for severe diarrhœa, usually combined with opium, and has

also been tried as rectal injection. Rapid emetic for narcotic poisoning, three or four grains in water every few minutes until vomiting occurs. Also suitable for acute phosphorus poisoning.

Locally in eye affections as stimulant and for gleet.

Actinomycosis and blastomycosis have been treated by internal administration and irrigation with 1% solution. In syphilis a mixed treatment with copper sulphate and potassium iodide may prove most effective. The rationale is based on the action of copper salts on vegetable parasites.—A.M.A. Nov. 11, 1905; B.M.J.E. i./06,24.

Membranous colitis in children, well treated by injection of solution 3 or 4 grains to the ounce with a little opium added.—L. i./06,94.

In dry skin affections, and in individuals with tubercular tendencies, $\frac{1}{10}$ grain doses thrice daily, appear to act like arsenic, and are sometimes better tolerated.

In diarrhœa, depending on ulceration of the bowel, $\frac{1}{4}$ to 1 grain doses with opium useful.—H.

In pyorrhœa alveolaris the gums are packed with copper sulphate, and the patient directed to swab the gum with saturated solution of tannin in Eau de Cologne; the tartar is removed from time to time.—Smale and Colyer.

Copper salts have bactericidal action, suggested for purifying water.—L. ii./05,1933.

Guttæ Cupri Sulphatis, R.O.H. 2 grains to the ounce. Suitable as a lotion for gleet.

Copper Points, contained in turned wood holders, are useful for eye and intra-uterine medication.

Cupri Chloridum, $CuCl_2 + 2H_2O = 169{\cdot}26$ (170·532 I. Wts.). *Dose*—$\frac{1}{4}$ to 2 grains (**0·016 to 0·13 Gm.**) Is a stronger antiseptic than copper sulphate for the treatment of water supplies. A solution containing 1 of copper in 5,000 will kill *B. Typhosus* in slightly over an hour and *B. Coli* in an hour. (*Staphylococcus Pyogenes Aureus* is killed in less than two hours by a 1 in 7,000 copper sulphate solution.—Journal of Sanitary Institute, vol. xxv., 1904.)

Pilula Cupri Sulphatis cum Opio, R.F.H. Copper Sulphate $\frac{1}{2}$ grain, Opium Powder $\frac{1}{4}$ grain, Chamomile Extract *q.s.* In diarrhœa dependent on ulceration of the bowel, and for cholera.

Lapis Divinus, R.O.H. Cuprum Aluminatum P.G.; P.Jap. (G.H. has less camphor.)

Potassium Alum, Copper Sulphate, and Potassium Nitrate, of each 1 part are fused together, Camphor equal to $\frac{1}{50}$ of the whole previously mixed with an equal weight of Alum is added and incorporated, and the mixture run into moulds to form pointed sticks.

CURARA.

Curare.—*Syn.* OURARI, URARI, WOURARA, WOURALI.

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

The South American Indian arrow poison, produced from species of *Strychnos* and other plants (*Loganiaceæ*.) A blackish-brown dry extract, with a bitter taste; contains some resin, but is nearly all soluble in water.

Curarina, $C_{19}H_{26}N_2O = 296·05$ (298·288 I.Wts.). (Dixon gives $C_{18}H_{35}N$, and in addition, Curine, $C_{18}H_{19}NO_3$ with digitalis-like action.) *Dose.*—$\frac{1}{400}$ to $\frac{1}{40}$ grain (?).

This, the active principle of Curare, is a powerful poison, in yellowish powder soluble in water and alcohol.

Anchusa Officinalis (*Boraginaceæ*) **Alkanet,** causes the heart to stop in diastole, it contains an alkaloid.

Echium Vulgare (*Boraginaceæ*). **Vipers' bugloss.** Causes same symptoms as alkanet with more hyperæsthesia and greater weakness of the muscles.

Cynoglossum Officinalis, Hound's-tongue. Often acts similarly to Curare, *v.* also *p.* 735.

Delphinium Bicolor, from North America, and **D. Scopulorum** from Mexico, also resemble Curare in action.—L. i./06,974. Researches on Curare.—P.J. 1890, 893,471; L. i./91,46.

Injectio Curare Hypodermica, B.P.C.

Dose.—1 to 6 minims (0·06 to 0·35 Cc.).

Curare, in powder, 5 grains, Distilled Water, a sufficient quantity. Add to the Curare distilled water *q.s.* to form a thin paste, transfer to a funnel plugged with absorbent wool, and gradually add more water until one drachm is obtained. **Hypodermic Tablets** contains $1\frac{1}{2}$ grain of Curare.

Uses.—In hydrophobia is given hypodermically. It paralyses the muscles, has been tried for strychnine poisoning. For tetanus, a case cured.—L. ii./04,831. Occasionally causes sugar in the urine.—Dixon.

DAMIANA.

The leaves of *Turnera diffusa var. aphrodisiaca* and other species (*Turneraceæ*) are recommended in the United States as possessing aphrodisiac properties. The drug is useful also in hemiplegia, paraplegia, and given in melancholia. Said to be tonic and diuretic.

Contains bitter substances, resins, and volatile oil.

Extractum Damianæ Liquidum, B.P.C. 1=1.

Leaves in 60 powder exhausted with alcohol 60 %.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Extractum Damianæ.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.). Is prepared by concentration of the above.

Mistura Damianæ Composita.

Dose.—1 to 2 drachms (3·5 to 7·0 Cc.).

Sodium Hypophosphite 5 grains, Calcium Hypophosphite 5 grains, Liquid Extract of Damiana ½ drachm, Liquid Extract of Nux Vomica 2 minims, Chloroform Water to 2 drachms.

Pilula Damianæ Composita.

Extract of Damiana 2, Phosphorus $\frac{1}{100}$, Extract of Nux Vomica $\frac{1}{8}$. In grains for 1 pill, in grammes for 15. *Dose.*—One, two or three times a day.

Capsules of Damiana Extract are each equivalent to 30 minims of the liquid extract.

DIGITALIS FOLIA (*Off.*). U.S.

Dose.—$\frac{1}{2}$ to 2 grains (0·032 to 0·13 Gm.).

The dried leaves of *Digitalis purpurea* (*Scrophulariaceæ*) or foxglove, collected from plants commencing to flower. ***Uses.***—To lessen fever and acute inflammations, as in pneumonia, also in heart disease with rapid weak pulse, and for cardiac dropsy, and delirium tremens. It slows the heart's action and strengthens its beats. To be avoided in cases of fatty degeneration of the heart and Bright's disease. It is generally recognised that Digitalis has cumulative action. Patients should be watched. In acute attacks in chronic bronchitis given to relieve strain on heart. Is notably diuretic only when there is venous congestion of the kidneys.—Dixon.

Small doses best.—Clin. Jl. Nov. 4, 1905. Methods of assay and results of examining leaves and extract.—P.J. i./03,425.

The leaf of the second year proposed. Powdered drug to be used entire.—C.U.D.

Keller's and the Keller-Kiliani reaction are used for identification of the various Digitalis Glucosides, *c.f.* Merck's Reagentien-Verzeichnis, 1903, 76.

Antidotes.—After emetics give gallic and tannic acid, camphor, nitroglycerin, coffee or tea, also ether or alcohol. Patient should lie down until recovery.

Incompatible with preparations of cinchona and with lead acetate, also with iron salts (but the blackening is preventable by citric acid) and with iodine and potassium iodide.

Infusum Digitalis (*Off.*). About 1 in 146.

Dose.—2 to 4 drachms (7 to 15 Cc.).

An infusion of digitalis produces as satisfactory results as any other preparation.—P.J. i./01,699.

U.S.—Digitalis 15, Boiling Water 500; infuse one hour, strain, add Alcohol 100, and Cinnamon Water 150, finally cold Water *q.s.* to 1,000.

Infusum Digitalis Concentratum, B.P.C.

Dose.—15 to 30 minims.

Leaves in 20, powder 480 grains are thrice macerated with 15 ounces of water, and after each maceration pressed; first pressings of 10 ounces mixed with 5 ounces of alcohol (90%); the remainder concentrated to 5 ounces and mixed with that set aside. Is 8 times strength of above. A good medicinal preparation.

Acetum Digitalis, Ph. Ned., Digitalis Leaves 1, Dilute Acetic Acid (6%) 9, Alcohol (90%) 1. Macerate 5 days.

Succus Digitalis, B.P.C.

Expressed Juice, 3; Alcohol (90%), 1.

Dose.—5 to 10 minims (0·3 to 0·6 Cc.).

Fluidextractum Digitalis, U.S. 1 = 1 by percolation with diluted alcohol.

Average dose.—1 minim (0·05 Cc.).

Digitalone. Physiologically standardised preparation suitable for hypodermic and intravenous use.

Dose.—Hypodermically 8 to 15 minims (½ to 1 Cc.). *Per os* 15 to 30 minims (1 to 2 Cc.) cautiously

increased. Is practically $\frac{1}{10}$ the strength of the U.S. preparation. Contains chloretone as preservative and 'anæsthetic.'

Tinctura Digitalis (*Off.*). 1 in 8 of 60% alcohol.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

U.S. 1 in 10 Alcohol 48·9% volume.

C.U.D. suggests 70% alcoholic percolate 1 in 10. **P. Belg.** has this.

Physiologically Standardised Digitalis Preparations are now advocated. Digitalis has a chemical action on cardiac muscle, and it is necessary to determine the minimum lethal dose of each batch of the drug or of its preparation. It is pointed out that squill, digitalis and strophanthus have strengths in proportion as 3 : $2\frac{1}{2}$: $\frac{1}{4}$.—P.J.ii./05,754. See also note on Physiological Standardisation.

Syrupus Digitalis, P. Belg. 1 of the Belgian Tincture to 19 of Syrup.

Pilula Digitalis Composita (Baillie's Pill).—St. George's H.

Mercurial Pill 2, Digitalis Leaves $\frac{1}{2}$, Squill 1. In grains for one pill; in grammes for fifteen.

Dose.—1, as often as 3 times a day.

Pilula Hydrargyri et Digitalis Composita. St. Bart's. H.

Mercurial Pill 1 grain, Digitalis 1 grain, Squill 1 grain, Extract of Henbane 2 grains.

Digitalis leaves and seeds contain several active crystalline and amorphous principles. They act for the most part as irritants to the skin, mucous membranes. Those with physiological activity slow the pulse and increase cardiac energy.

Digitaline Amorphe (Homolle or Codex).

Syn. Chloroformic Digitalin.

Dose.—$\frac{1}{60}$ to $\frac{1}{30}$ grain (0·001 to 0·002 Gm.).

An amorphous yellowish powder, or small scales, irritating to the nostrils, intensely bitter, and poisonous. Practically insoluble in water, but soluble in alcohol and chloroform, and consists principally of a glucoside resembling digitoxin in its action.

Granules de Digitaline (Homolle) contain 1 milligramme ($\frac{1}{65}$ grain). *Dose.*—1 or 2.

Digitaline Cristallisée (Codex). Nativelle's Digitaline. *Dose.*—$\frac{1}{250}$ to $\frac{1}{60}$ grain (0·00025 to 0·001 Gm.), in pill.

Light, white crystals, very bitter; insoluble in water, nearly insoluble in ether, soluble in chloroform and alcohol. It consists almost entirely of digitoxin, is cumulative in action, and very potent; should be prescribed as Digitaline, crystallized (Nativelle).

Granules de Digitaline Cristallisée contain $\frac{1}{4}$ milligramme in each.

Soluté Officinal de Digitaline Cristallisée. Crystallized Digitaline 1, Glycero-alcohol *q.s.* to measure 1,000.

Dose.—4 to 16 minims (0·25 to 1 Cc.).

Nativelle's Digitalin has been found more satisfactory than the German.—B.M.J. ii./05,682; C.D. ii./05,510.

Digitalis and Strophanthus combined produce double action on the heart and a single action on the arteries, obtaining thus minimum of blood pressure with maximum cardiac effect.—M. Arch., Dec. 1905,385.

Digitalinum Pulverisatum Purum Germanicum. *Dose.* — $\frac{1}{64}$ to $\frac{1}{32}$ grain (0·001 to 0·002 Gm.) consists, according to Kiliani, of the glucosides Digitoxin and Digitonin 40 to 50 per cent. with the so-called Digitalein and Digitalin Cryst. It is a yellowish-white powder soluble in water and alcohol, nearly insoluble in chloroform. Is active, 1 part = about 70 of Tincture. *Is most suitable for hypodermic injection.*

The dose, according to Merck, 1905, is "from $\frac{1}{10}$ to $\frac{1}{2}$ grain three or four times daily in pills or tablets or subcutaneously."

Hypodermic Tablets, $\frac{1}{100}$ grain (0·00065 Gm.).

Digitalinum Crystallisatum. $C_{27}H_{46}O_{14}5H_2O$ =679·29 (684·448 I. Wts.). *Syn.* DIGITONIN (CRYST.). Is soluble to some extent in a mixture of chloroform and alcohol. Possesses little medicinal or physiological activity.

Digitalein (Schmiedeberg) consists of amorphous Digitonin (without typical cardiac action) and crystallized Digitonin. Soluble in water or alcohol, but insoluble in chloroform or ether.

Digitoxin. $C_{28}H_{46}O_{10} = 538{\cdot}28$ (542·368 I. Wts.).
Dose—$\frac{1}{250}$ to $\frac{1}{64}$ grain (0·00025 to 0·001 Gm.).

Crystallized, as prepared by Merck. This is a potent Glucoside, cumulative in action. Soluble about 1 in 100 of absolute alcohol, and soluble in chloroform.

Owing to its insolubility in water, and this being prone to develop fungi, an aqueous vehicle is inadmissible for the administration of digitoxin; the best method is in solution in Glycero-alcohol (*vide p.*369). Solutions may be made containing $\frac{1}{64}$ grain (0·001 Gm.), Digitoxin in 17 minims (1 Cc.) of the mixture. This quantity will approximate 40 drops which may be considered a maximum dose. Suitable either *per os* or as an enema. May also be given in **Syrup**, Digitoxin 0·1, Alcohol (90%) 200, Distilled Water 750, Syrup to 2,500. *Dose.*—1 to 4 drachms (3·5 to 15 Cc.).

Tablets and Granules of Digitoxin are prepared containing $\frac{1}{250}$ grain ($\frac{1}{4}$ milligramme).

Pilula Digitoxin contains $\frac{1}{250}$ grain.

Digalen (Cloetta's).

A proprietary solution said to contain in each dose of 1 Cc. (15 minims) 0·3 mgr. of a white amorphous glucoside of same empirical formula as digitoxin.—B.M.J. ii./04,1323; C.D. i./05,68.

In treatment of œdema of cardiac debility.—B.M.J. i./05,1077.

ELÆOSACCHARA, P.G.

Oleosaccharures (Fr.); Oleosaccari (F. Ital.).

This term is applied to triturations of volatile oils with sugar. They are made of the strength of 1 part by weight of the oil to 50 (20 F. Ital.) of sugar, or approximately 2 drops to 60 grains, and should be prepared as required. Mostly in use are those of **anise, cinnamon, citron,** and **peppermint.** They are used to disguise the flavour of nauseous powders, that of cinnamon as a corrective with bismuth particularly.

ELATERIUM (*Off.*).

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ grain (0·0065 to 0·032 Gm.).

The dried sediment from the juice of fruit of *Ecballium Elaterium* (*Cucurbitaceæ*).

Is a powerful hydragogue cathartic, useful in renal or cardiac disease complicated with dropsy.

Pilula Elaterii Composita, St. Bart's. H.

Elaterium ¼ grain, Compound Extract of Colocynth 2 grains, Calomel 1½ grains, Capsicum ½ grain, Syrup of Glucose *q.s.*

Tinctura Elaterii Composita.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

Elaterium in powder 1, Chloroform 50, macerate 2 days, then add Alcohol (90%) 200, and Compound Tincture of Cardamoms 250, macerate 5 days more and filter. Is more active than a corresponding dose of the powder.

Elaterinum, Elaterin (*Off.*, U.S.). *Syn.* MOMORDICIN. $C_{20}H_{28}O_5$=345·6 (348·224 I. Wts.).

Dose.—$\frac{1}{40}$ to $\frac{1}{10}$ grain (0·0016 to 0·0065 Gm.).

The crystalline neutral active principle of Elaterium, insoluble in water, soluble in chloroform (about 1 in 12) and sparingly in alcohol.

Pulvis Elaterini Compositus (*Off.*).

Dose.—1 to 4 grains (0·065 to 0·32 Gm.).

Elaterin 1, Milk Sugar 39. This is a Trituration, *q.v.*

ELIXIRS.

These are generally composed of a weak-flavoured syrup with a fair proportion of alcohol, which latter may account for much of the esteem in which they are held.

For a complete list consult the Index.

Elixir Adjuvans, U.S. Fluidextract of Glycyrrhiza 120, Aromatic Elixir 880.

Elixir Aromaticum, Aromatic Elixir, U.S.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Compound Spirit of Orange, U.S. 12, Alcohol to 250. Add gradually, with constant agitation, Syrup 375, and then Distilled Water 375. Mix with the liquid Purified Talc 30, and filter until clear; then add a mixture of Alcohol 1 and Distilled Water 3 *q.s.* to 1000. (*Spiritus Aurantii Compositus,* U.S.—Oil of Orange Peel 40, Oil of Lemon 10, Oil of Coriander 4, Oil of Anise 1, Alcohol to 200).

Elixir Simplex, B.P.C., 1894.

Oil of Bitter Orange 30 minims, Rectified Spirit 6 ounces

Dissolve and add, Distilled Cinnamon Water 7 ounces, Syrup 7 ounces. Filter through paper moistened with proof spirit, and well sprinkled with kaolin, returning the first portions of filtrate until it passes through bright.

Dose.—20 minims to 1 drachm. This quantity may be added to the ounce of a liquid medicine.

Syrupus Aromaticus (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Tincture of Orange 1, Cinnamon Water 1. Mix. Shake with a little powdered talc, filter and add Syrup 2.

Elixir Rhei, B.P.C.

Dose.—1 to 3 drachms (3·5 to 10·5 Cc.).

Rhubarb in No. 12 powder 5, Fennel (bruised) 2, Glycerin 3, Sugar 4, Mixture of Alcohol 90% 1, and Water 3, *q.s.* to 20.

Moisten the rhubarb and fennel with diluted spirit 15, macerate 48 hours and press. Break up the mass and add more menstruum *q.s.* to produce, after macerating 24 hours and pressing, 15, with the former liquor. After again standing 2 days filter into the glycerin and sugar and dissolve without heat.

Elixir Rubrum.

Dose.—20 minims to 1 drachm (1·2 to 3·5 Cc.).

Solution of Carmine (*q.v.*) 1, Simple Elixir 64. Gives an agreeable flavour and colour to liquid medicines, but is not compatible with acids.

Elixir Ficorum.—*Syn.* SYRUPUS FICORUM.

Elixir or Syrup of Figs.

Dose.—1 to 4 drachms at bedtime or early morning.

Figs cut very small 32 ounces, add Distilled Water 90 ounces, stew at a gentle heat for one hour, then boil and add Senna 16 ounces; digest in a covered vessel for 2 hours; then press slowly and forcibly so as to obtain 52 ounces of liquid; break up and again digest the marc in Boiling Water 20 ounces for 2 hours and press. Mix the Liquors obtained, boil for 3 minutes and when cold add Alcohol (90%) 9 ounces; agitate gently, set aside 2 hours, and filter. Wash the filter, evaporate or recover the Alcohol by distillation, and concentrate the filtrate to 56 ounces, and in it dissolve Sugar (made warm) 40 ounces. Mix Oil of Peppermint 5 minims, Oil of Cloves 20 minims, Chloroform 25 minims, Alcohol (90%) 150 minims, and add this to the Elixir with agitation. The product should measure 80 ounces.

EMBLICÆ FRUCTUS.

Dose.—One, two, or more as required.

The fruit preserved in syrup, or crystallised in sugar, of

Myrobalanus emblica, Emblica officinalis, Nelli, or Nilicamam. Used in India to excite the appetite, and taken after meals for atonic dyspepsia. In the fresh state, the fruit consists of a fleshy, acidulous pulp enveloping an angular nut. The pulp is rather austere and is possessed of purgative properties.

Is a valuable addition to our list of laxatives, taken at dinner, beneficial for children.—B.M.J. i./96,346; L.i./96,557.

Confectio Emblicæ.

The preserved fruit, pulped and freed from nuts, &c.

Dose.—1 or 2 teaspoonfuls. Promotes appetite and acts as a tonic.

Crystallized Emblic Fruits (dry).

Dose.—One, two, or more.

Black or Chebulic Myrobalans, *v.p.* xxvii.

ERGOTA.

Ergot of Rye (*Off.*).—*Syn.* SECALE CORNUTUM.

The sclerotium of the fungus *Claviceps purpurea* (*Pyrenomycetes*) on *Secale cereale* (*Graminaceæ*).

To be not more than 1 year old (U.S.) and to be kept whole, not in the powdered condition.—C.U.D.

Dose.—20 to 60 grains (1·3 to 4 Gm.) in recent powder infused in boiling water.

Uses.—Almost entirely for its action on the uterus, stimulating muscular contraction, and so to check bleeding after parturition, and, from the presence of fibroid tumour, also to promote involution.

Ergotin causes spasm of arterioles and rise of blood pressure, by acting directly on the vessels independently of the central nervous system. It is useful in polyuria.

Is also given to check night sweats, spermatorrhœa and menorrhagia. It has been suggested for the relief sleeplessness, by causing cerebral anæmia by constricting the blood vessels.

For disordered circulation and for headache (hypodermically), alcoholism, hysteria and in acute inflammatory infections—meningitis, pneumonia, pericarditis. —New York Med. Assoc., March, 1903.

Yield of alkaloid 0·06 to 0·12%.—P.J. ii./04,475.

Estimation method.—P.J. ii./05,580.

Extractum Ergotæ Liquidum. 1=1 of Ergot. (*Off.*), and C.U.D.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.) or more

B.P. directions are to exhaust 20 ounces with 7½ pints of water by repeated infusion and evaporate to 14 ounces. Equally good effect can be produced by repercolation without evaporation.—C.D. i/05,464.

Extractum Fungi Secalis Fluidum, P. Austr. Extract fat from Ergot 100 by petroleum ether; dry the marc and moisten with a mixture of Glycerin 5, Alcohol 20, Water 20. Percolate to 100.

"Ergot Aseptic." Concentrated and sterilised liquid extract in 1 Cc. bulbs, representing Ergot 2 Gm.

In chorea 1 to 1½ drachms of liquid extract together with liquor arsenicalis 2 to 3 minims.—B.M.J. i.05,354.

Surgical shock prevented by ergot with sparteine.—L. ii./04,1395.

The preparation of **P. Belg.** (1=1) contains 1·7% hydrochloric acid and the Ergot is first freed from fat with Petrolein.

Infusum Ergotæ (*Off.*) 1 in 20.

Dose.—1 to 2 ounces (30 to 60 Cc.).

Tinctura Ergotæ (B.P. 1885). 1 in 4.

Dose.—5 to 30 minims (0·3 to 1·8 Cc.) or more.

Ph. Ned 1 in 5 in Alcohol 70% Ergot freed from fat with Petroleum Ether.

Cornutine (Kobert). *Dose.*—$\frac{1}{6}$ grain (0·01 Gm.) daily.

A brownish-grey amorphous alkaloid contained in ergot, very slightly soluble in water. Is said to be an efficacious hæmostatic in hæmorrhage from genito-urinary organs. Raises blood-pressure, but does not cause gangrene. The **Hydrochloride**, in brown scales, is more soluble. *Dose* of either—$\frac{1}{6}$ to $\frac{1}{4}$ grain daily, in divided doses.—L. i./92,766; B.M.J. i./92,500. Is not found in all Ergot; is probably a decomposition product of Ergotinine.—Ph. *vide infra.*

Experiments show that Cornutine will give rise to convulsions by action on the medulla.—Dixon.

Cornutine Citrate is a brown powder, only very slightly soluble in water. *Dose.*—$\frac{1}{12}$ to $\frac{1}{6}$ grain (0·005 to 0·01 Gm.) in pill, daily; an equivalent several times daily; a sterile injection may be prepared.

Clavin. $C_{11}H_{22}N_2O_4$=244·41 (246·256 I. Wts.).

Dose.—Subcutaneously $\frac{1}{6}$ to $\frac{1}{3}$ grain (0·01 to 0·02 Gm.)

A new active principle from ergot. Has marked action on the uterus of pregnant animals. 2% solutions have been employed on human beings. Does not produce either gangrene or convulsions.—P.J. ii./05,554.

Tablets of Clavin, $\frac{1}{3}$ grain (0·02 Gm.) for subcutaneous and internal use (with $1\frac{1}{3}$ grain of salt) are prepared.

Sphacelotoxin, a nitrogen-free resin, is another constituent of Ergot. Soluble in alcohol but insoluble in water.—Dixon.

Vinum Ergotæ, U.S.

Average dose.—2 drachms. Fluidextract of Ergot 20, Alcohol 5, White Wine 75.

Injectio Ergotæ Hypodermica (*Off.*).

Dose.—3 to 10 minims (0·18 to 0·6 Cc.).

Extract of Ergot 10, Phenol 0·3, Distilled Water, *q.s.* to 30. Should be freshly prepared.

Use.—In epistaxis, injection into the arm of 3 grains of Extract in 10 minims of warm water is successful. A dose of Ergotin, injected deeply into the gluteal muscles just before delivery, seldom fails to give perfect uterine contraction. Neither ergot nor iron will induce abortion in pregnant women unless previously disposed (Lombe Atthill).—B.M.J. i./89,350.

Extractum Ergotæ (*Off.*). *Syn.* — ERGOTIN, EXTRACTUM HÆMOSTATICUM (F.E.).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Ergot, in No. 40 powder, 1000, is exhausted with 60% alcohol, and the percolate evaporated to 250. To this is added Distilled Water 250, the mixture filtered, Diluted Hydrochloric Acid 47, added, and after twenty-four hours again filtered, Sodium Carbonate 20, added, and the mixture evaporated to a soft extract.

This extract was designed not exclusively for medication *per os*, but also for hypodermic use.

Ergot contains sphacelinic acid and colouring matter. In the official process the acid is precipitated by water and the colouring mater by hydrochloric acid, which is then neutralised by sodium carbonate. For making a hard extract for pills evaporate to dryness and add milk sugar or powdered althea.—P.J. ii./04,107.

U.S. is similar in strength and method of making, but contains 10% of glycerin.

A watery extract should be prepared and be made up to volume with Alcohol 60%.—C.U.D.

It is given to check all forms of passive hæmorrhage. **Tablets and Pills**, 1, 2, and 3 grains. *Dose.*—1 to 3. **Capsules of Ergotin** contain 3 and 5 grains (0·2 and 0·3 Gm.). (*c.f.* also Capsules Apiol and Ergotin).

Ergotinina, *Ergotinine Cristallisée* $C_{35}H_{40}N_4O_6$ = 607·89 (612·48 I. Wts.), F.E.

Dose.—$\frac{1}{200}$ to $\frac{1}{40}$ grain (0·00032 to 0·0016 Gm.).

An alkaloid in minute yellowish crystals, insoluble in water, soluble in alcohol, ether, chloroform, and dilute acids, present to the extent of 0·1 to 0·25 % in Ergot.

Solution hypodermique d'Ergotinine de Tanret.

Dose.—3 to 10 minims (1 Cc. contains 0·001 Gm.).

Ergotininæ Citras.

$$C_{35}H_{40}N_4O_6\begin{Bmatrix}CH_2.COOH\\C.OH.COOH\\CH_2.COOH\end{Bmatrix} = 798{\cdot}51\ (804{\cdot}544\ \text{I.Wts.}).$$

Dose.—$\frac{1}{150}$ to $\frac{1}{30}$ grain (0·00043 to 0·0022 Gm.).

A soluble salt of the above, in greyish powder.

Hypodermic Tablets are also prepared containing $\frac{1}{200}$ and $\frac{1}{100}$ grain of Ergotinine citrate.

Ergotininæ Hydrochloridum.

Dose—$\frac{1}{150}$ to $\frac{1}{30}$ grain (0·00043 to 0·0022 Gm.).

A soluble salt in yellowish powder.

Liquor Ergotæ Aceticus. *Syn.*—**Fluidextractum Ergotæ. U.S.** Contains 2% of acetic acid, with diluted alcohol. 1 = 1 of Ergot.

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

U.S. *Average dose.*—30 minims.

Liquor Ergotæ Ammoniatus.—1 = 1 of Ergot.

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

An efficient and reliable preparation, made with diluted ammoniated alcohol.

Ammonia not only exhausts Ergot of its active medicinal properties, but also secures a uniform, stable preparation; the combination of ammonia and Ergot is indicated in some forms of post-partum hæmorrhage, &c. In dose of $\frac{1}{2}$ to 1 drachm is useful in second stage of labour when the pains are feeble but the passages are normal.

Tinctura Ergotæ Ammoniata (*Off.*).

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

Ergot 5, Solution of Ammonia 2, Alcohol (60%)

q.s. to 20 by percolation. The B.P.C. preparation contained 1 in 2 of Aromatic Spirit of Ammonia.

Mistura Ergotæ cum Ferro, St. M.'s H.

Liquid Extract of Ergot ½ drachm, Tincture of Ferric Chloride 15 minims, Spirit of Chloroform 10 minims, Glycerin ½ drachm, Water to 1 ounce.

Acidum Scleroticum.—*Syn.* SCLEROTINIC ACID.

$C_{12}H_{19}NO_9$ (?)=318·78 (321·192 I. Wts.).

Dose.—½ to ¾ of a grain (0·032 to 0·05 Gm.) hypodermically.

An amorphous brown hygroscopic acid principle obtained from Ergot.

Injectio Acidi Sclerotici Hypodermica.

One grain in 6 minims. *Dose.*—3 to 5 minims.

Should be freshly prepared, or, if required to be kept, 1 % of phenol should be added.

Hypodermic Tablets contain $\frac{1}{16}$ grain (0·004 Gm.) Sclerotic Acid.

As a hæmostatic Sclerotic Acid possesses all the virtues of Ergot. Injected hypodermically, it causes no inflammation at the seat of puncture.

It accelerates the intestinal peristalsis, and excites contraction both of the pregnant and non-pregnant uterus, pre-existing contractions being intensified; it is not a powerful poison.

ERYTHROL NITRAS.

$CH_2.ONO_2 - CH.ONO_2 - CH.ONO_2 - CH_2.ONO_2$= 299·96 (302·208 I. Wts.).

Syn. ERYTHROL TETRANITRATE; NITRO-ERYTHRITE.

Dose.—½ to 1 grain (0·032 to 0·065 Gm.), increased to 3 grains or more in tablet form *vide infra*.

In hard, colourless and tasteless acicular crystals or plates, nearly insoluble in water, ***soluble*** about 1 in 60 of absolute alcohol; melting point, 61° C. It is formed by dissolving erythrol (a sugar) in fuming nitric acid, and precipitating by sulphuric acid; is explosive, except when in solution in chocolate.

Uses.—As a vaso-dilator like nitroglycerin and amyl nitrite, and has a less powerful though perhaps more prolonged action in reducing blood-pressure. Employed in angina pectoris, chronic Bright's disease, nephritis, aneurism, Raynaud's disease, dyspnœa headache, and nervous affections.

The maximum dilatation occurs in from 2 to 3 hours.—Dixon.

For angina, to avert paroxysms even half a drachm a day was taken.—B.M.J. i./98,18,127; i./99,256, 1088.

Has been found to be an excellent sedative in lead colic, as it relaxes the painful spasms of the intestinal coats.—Nouveaux Remèdes, 1901,477.

Tabellæ Erythrol Nitratis. *Dose.*—1 or 2.

Contain ½ grain, combined with chocolate; the fat of the chocolate being a solvent of the nitrate. Tablets containing ⅛, ¼ and 1 grain are also prepared.

These tablets are the best method of administration.—B.M.J. i./97,907; i./99,256; ii./99,411.

Præcordial pains promptly relieved by a tablet three times a day.—B.M.J. i./98, 431.

Asthma, very effective in, especially if followed by some hot drink, *e.g.*, Bovril, relief lasts at least 24 hours.—W.W.W.

Mannitol Nitrate, Mannitol Hexanitrate.—$CH_2.ONO_2.CH.ONO_2)_4.CH_2.ONO_2 = 448{\cdot}94$ (452·304 I. Wts.) *Syn.* HEXANITRIN; NITROMANNITE.

Dose.—1 grain (0·065 Gm.), increased.

The nitrate of the hexatomic alcohol mannite, *v.p.* 742.

$C_6H_8(OH)_6 = 180{\cdot}74$ (182·112 I. Wts.). **Ph. Ned.**

In light acicular crystals, M.P. 113° C.; is less soluble in water, but more explosive than erythrol nitrate, and if long kept is liable to decomposition. Requires extra care. Is used similarly to erythrol nitrate, and is not so costly. In angina and asthma its action is not so powerful, but probably more prolonged than that of the former.—B.M.J. ii./95,1213; i./98,528.

Tabellæ Mannitol Nitratis.

Contain 1 grain (0·065 Gm.) in each with chocolate.—B.M.J. i./98,893.

ERYTHROPHLŒUM.

Casca Bark.—*Syn.* SASSY BARK; ORDEAL BARK. The bark of *Erythrophlæum guineense* (*Leguminosæ*).

Tinctura Erythrophlœi.

1 in 10 Alcohol (90%). *Dose.*—5 to 10 minims (0·3 to 0·6 Cc.).

Erythrophlœinæ Hydrochloridum. *Dose.*—$\frac{1}{60}$ to $\frac{1}{24}$ grain (0·0016 to 0·0027 Gm.) in pill.

In yellowish white granular crystals, readily soluble in water. The solution has an acrid, bitter taste. Has the combined action of digitalin and picrotoxin.

In mitral disease, and cardiac dropsy depending on it, is a more powerful remedy than digitalis, and is useful in dilated heart. It is less cumulative.—Amer. Med., June, 1903.

Dental Use.—An almost ideal drug for the treatment of sensibility of dentine. It is a true obtundent only where locally applied, and has no central direct effect on the pulp. The sensibility in a cavity filled with the alkaloid was in 24 hours absolutely abolished.

'**Throphleol**,' a solution (50%) of **Erythrophleine Hydrochloride** in **Eugenol** is most conveniently used.

After thorough dehydration of the cavity a small piece of cotton or bibulous paper saturated with the solution is sealed in with a temporary gutta percha filling, placing as much as possible in actual contact with the dentine, and left *in situ* for 24 or 48 hours, not longer, or slight inflammatory symptoms in pulp or peri-cementum supervene. With this exception it has no injurious effects even for young children. Death of the pulp has not been observed after use. Pain and peri-cementitis 2 or 3 days after filling have, however, been reported.—Dental Annual and Directory, 1904, *p.*223.

Excavation of the approximal cavity in a first molar was painless, but that of the occlusal cavity in the same case was painful.—Dental Surgeon, April 15, 1905.

EUCALYPTI FOLIA.

Dose.—5 grains (0·32 Gm.) or more in powder.

The dried leaves of *Eucalyptus Globulus* (*Myrtaceæ*), or Blue Gum-tree of Australia, have been employed medicinally in the treatment of ague and bronchitis, and are now much used in Italy for Roman and malarial fevers; also, when coarsely powdered, are employed for smoking in cigarettes in cardiac and aneurismal asthma. They are official in U.S.

Oleum Eucalypti (*Off.*), **U.S.**

Dose.—$\frac{1}{2}$ to 3 minims (0·03 to 0·18 Cc.) on sugar,

emulsified, or mixed with olive oil. U.S. *average dose* 8 minims.

Is principally distilled from the leaves of *Eucalyptus globulus*, as well as *E. amygdalina*, *E. dumosa*, *E. oleosa*, *E. Cneorifolia*, *E. uncinata*, *E. gracilis*, *E. incrassata*, *and E. citriodora* (the latter has odour resembling lemon-grass). The amount yielded from the fresh leaves is about 1 to 4%. The official oil contains at least 50% eucalyptol. The oil ozonizes the atmosphere whilst oxidizing. The pinenes contained have the principal action in this direction. It has a pale yellow colour, a spicy taste, producing an after-sensation of coldness in the mouth, a camphoraceous odour; boils between 338° and 392° F.; its official Sp. Gr. is 0·910 to 0·930. It is not caustic, nor should it cause much coughing when inhaled (due to Phellandrene—for inhalation the oil should have a Sp. Gr. not below 0·9), nor irritate when applied to the skin or mucous membrane. It has bactericidal properties.

Soluble in oils, fats, paraffins, and about 3 in 1 of 90% alcohol, and in all proportions in absolute alcohol.

Emulsio Olei Eucalypti.

Dose.—1 to 4 drachms (4 to 16 Cc.)

Eucalyptus oil, Gum Acacia of each 1 in a dry bottle, add water 40, shake well.

Uses.—The emulsion above is useful as an urethral injection or lotion, and internally in malarial fevers and chronic cystitis. The oil is antiseptic and is useful mixed with an equal quantity of olive oil as a rubefacient for rheumatism, and is a popular prophylactic, inhaled or sprayed for influenza and bronchial catarrh.

An infusion of the leaves 10 grains in an ounce of water lessens the excretion of sugar in diabetes, and is said to have effected cures.—B.M.J. i./02,1295.

Oil from various species described.—Y.B.P. 1902,79.

West Australian Eucalypts and their Oils. **Aromadendral** is a new aldehyde.—P.J. ii./05,356,382.

Poisoning by drachm doses in Australia. Emetics: Recovery.—L. ii./05,963,1894.

Two drachms poisonous.—B.M.J. i./06,1085.

Death follows taking six drachms.—B & C.D. i./06,12.

Eucalyptus Gauze. Contains 5% and is supplied in yard pieces.

Eucalyptus Gauze Bandages. 5 inches wide (6 yards long).

Eucalyptus Wool, Absorbent, 5%, 1 lb. rolls.

Eucalyptene Hydrochloride, Eucalypteol.

$C_{10}H_{16}.2HCl = 207{\cdot}48$ (209·044 I. Wts.).

Dose.—2 to 6 grains (**0·13 to 0·4 Gm.**).

White crystals, soluble in alcohol, insoluble in glycerin and water. Has been given with success in diarrhœa and typhoid, and has relieved cough in phthisis.

Eucalyptol, U.S., F.E.—*Syn.* CINEOL; CAJUPUTOL.

$C_{10}H_{18}O = 152{\cdot}98$ (Off. and U.S. Wts.) (154·144 I. Wts.)

Dose.—1 to 4 minims (**0·06 to 0·24 Cc.**).

Is that portion of eucalyptus oil which passes over between 347° and 351° F., and crystallizes at 30° F. It is preferred to the crude oil for use in the oro-nasal inhalers, as it does not dry up as a varnish. It may be obtained from the oil by the action of phosphoric acid, with which it forms a crystalline compound, **Eucalyptol Phosphate** (official test.—P.J. 1894,501; L. i./95,687). On addition of water, this splits up, setting free Eucalyptol.

Phellandrene, $C_{10}H_{16} = 135{\cdot}1$ (136·128 I. Wts.) which crystallizes with nitrous acid forming the compound $C_{10}H_{16}N_2O_3 = 210{\cdot}62$ (212·208 I. Wts.) is a large constituent of the oil of *E. amygdalina*, producing an irritating effect when inhaled.

Fluidextractum Eucalypti, U.S. 1=1 Hydro-alcoholic percolate. *Average dose.*—30 minims.

Tinctura Eucalypti Foliorum, B.P.C.

Dose.—15 minims to 2 drachms (0·9 to 7 Cc.).

One of leaves in alcohol 90% to produce 5.

Unguentum Eucalypti (*Off.*).

Hard Paraffin 4, Soft Paraffin, white, 5. Melt, and add while hot, Oil of Eucalyptus 1. Stir till cold. As mild antiseptic dressing.

Unguentum Eucalypti et Acido Borico.

Eucalyptus Oil 40, Boric Acid 120, Soft Petroleum to 500. Lessens secretions of rhinitis.—M. Arch., 1905.

Vapor Eucalypti, T.H.

Eucalyptus Oil 20 minims, Light Magnesium Carbonate 10 grains, Water to 1 ounce. A teaspoonful in a pint of hot water. (Vic. Park has double quantity of oil.)

Vapor Eucalypti Compositus, R.F.H.

Eucalyptus Oil 2, Compound Tincture of Benzoin 3, Thymol 1, Spirit of Chloroform to 8. 10 drops at a time to be inhaled through an inhaler, *e.g.*, the 'Ozonic.'

Nebula Eucalypti Composita.

Form A.—Eucalyptus Oil 5 minims, Cinnamon Oil 2 minims, Menthol 12 grains, Liquid Paraffin containing 2% Aristol to 1 ounce. A small quantity sprayed into the nostrils at bed time, and occasionally afterwards if suffering, is said to be a cure for a common cold.

Form B.—Eucalyptus Oil 5 minims, Wintergreen Oil 5 minims, Menthol 5 grains, Liquid Paraffin to 1 ounce.

Pessaries, composed of 6 drachms of Eucalyptus oil, and 4 drachms each of oil of theobroma and white wax, divided into 12, one night and morning, or at night only, found useful after parturition, checks fetor and decomposition of lochial discharge.

References to Eucalyptus Oil.

The oil has been given internally in scarlet fever, and has been applied to the skin by inunction as an antiseptic.

Typhoid fever has been treated by 10 minim doses of Eucalyptus Oil. The oil must contain a sufficiency of ozone due to oxidation of the terpenes—or with advantage a little hydrogen peroxide may be added. There is a marked reduction in temperature.—C.D. i./05,402.

Ankylostomiasis treated with good results by Eucalyptus Oil. Two formulæ (i.) weak,—Eucalyptus Oil 2 gm., Chloroform 3 gm., Castor Oil 40 gm. (ii.) strong,—Eucalyptus Oil 2·5 gm. Chloroform 3·5 gm. Castor Oil 40 gm. *Dose* ¼ to ½ of either according to age and condition of patient. Also successful for tapeworm and threadworm. L. i/06,285.

Eugol. A proprietary said to contain Beta-Naphthol, Boric Acid, Menthol, Thymol, Eucalyptol, Gaultheria and Hamamelis,—B.M.J. i./98,702.

Solyptol Soap. Contains Eucalyptus Oil and antiseptics in an Olive Oil Soap basis.

EUCALYPTI GUMMI.

Eucalyptus Gum. (*Off.*).—*Syn.* RED GUM.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

May be made into pills with mucilage of acacia and a trace of glycerin, quickly manipulated.

A ruby-coloured exudation from *Eucalyptus rostrata* (*Myrtaceæ*), and some other species, imported from Australia. From 80 to 90% of it is soluble in cold water,

almost entirely soluble in Alcohol (90%). Tough, and difficult to powder, is astringent to the mucous membrane.

Uses.—In diarrhœa, relaxed throats, and given with success to check the purging of mercurial pill administered for syphilis.

This gum should be distinguished from the common Australian or Botany Bay kino, said to be the produce principally of *E. resinifera* (*Myrtaceæ*). The latter is very resinous and little soluble in water, was made official in I.C. Add. as Kino Eucalypti, *v.p.*xxvi.

Decoctum Eucalypti Gummi. 1 in 40.

Boil till dissolved and strain. Used as gargle, and given for diarrhœa in 2 to 4 drachm doses.—L.ii./83,1029.

Extractum Eucalypti Gummi Liquidum, B.P.C.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.). in water.

Eucalyptus Gum 7, Distilled Water 20. Dissolve by constant shaking, strain and add Alcohol 90% 1.

A styptic. Injected into the nostril stops bleeding from the nose, and applied on lint arrests hæmorrhage from wounds. A tablespoonful to a pint of water forms an astringent injection for the vagina or bowel. This dilution may be also used as a gargle, and still weaker as a collyrium.

Insufflatio Eucalypti Gummi.

Eucalyptus gum in fine powder 1, Starch 1.

Applied by means of an insufflator, is a powerful astringent in hæmorrhage and relaxed conditions of the larynx and trachea. It does not thus affect the palate or appetite.

Suppositoria Eucalypti Gummi.

Contain powdered gum 5 grains each with cacao butter basis (pressed dry.)

Syrupus Eucalypti Gummi.

Liquid Extract of Eucalyptus Gum 5, Sugar 3. Dissolve. *Dose.*—30 to 60 minims (1·8 to 3·5 Cc.).

Syrupus Eucalypti Rostratæ.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc)..

The following formula is suggested by Victorian Committee for inclusion in next B.P.—C.D. i./06,110.

Red gum of *Eucalyptus rostrata* 800 grains, boiling Distilled Water, 9½ ounces; Refined Sugar 16 ounces; Oil of Eucalyptus ½ drachm; Mucilage of Acacia ½ ounce. Dissolve the first in the second, unite the fourth with the fifth, add the third, and make syrup.

Tinctura Eucalypti Gummi.

Eucalyptus Gum 1, Alcohol (90%) 4. Shake till dissolved and strain. *Dose.*—20 to 40 minims (1·2 to 2·4 Cc.). 1 to 7 of water forms a very astringent gargle.

Trochisci Eucalypti Gummi. (*Off.*).

Contain 1 grain (0·065 Gm.) in each, with fruit paste.

Trochisci Eucalypti Compositi.

Potassium Chlorate 2 grains, Cubeb Powder ¼ grain, Eucalyptus Gum 1 grain. With fruit paste, and are marked C.E. Useful in congested and relaxed throats, especially when mucous secretion is arrested.

EUONYMI CORTEX (*Off.*). U.S.

The Root Bark, obtained from *Euonymus atropurpureus* (*Celastraceæ*), the wahoo or spindle-tree.

Uses.—Possesses tonic, hydragogue, cathartic, diuretic, and antiperiodic properties.

Extractum Euonymi Siccum. Dry Extract of Euonymus. (*Off.*). *Syn.* EUONYMIN.

Dose.—1 to 2 grains (0·065 to 0·13 Gm.).

The bark in No. 20 powder is percolated with 45% alcohol, the percolate concentrated, calcium phosphate added, and the mixture evaporated and reduced to powder. It must be kept cool and dry, or it cakes together again. (Naylor.—P.J. July 28, 06, recommends 70% alcohol). U.S. 1=4 of bark by concentration of Liquid Extract and making up to weight with powdered Glycyrrhiza.

Pilula Euonymin.

Euonymin 2 grains (0·13 Gm.), Extract of Henbane, *q.s.*, for one pill; take at bedtime. A cholagogue stimulant, producing no depression or headache; requires to be followed by a saline aperient in the morning.

One grain, combined with 4 grains of Iridin, is a successful purging dose.

Tablets, Euonymin, $\frac{1}{6}$, $\frac{1}{2}$ grain.

Extractum Euonymi Liquidum.

1 = 1 made with Alcohol (90%) 4, water 1.

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Fluidextractum Euonymi. U.S. 1=1.

Dose.—8 minims (0·5 Cc.). Hydro-alcoholic.

Tinctura Euonymi, B.P.C.

Dose.—10 to 40 minims (0·6 to 2·4 Cc.).

Euonymus Bark in No. 20 powder 1, Alcohol (90%) 5. Moisten, macerate 24 hours, and percolate to 5.

EUPHORBIA PILULIFERA.

(*Euphorbiaceæ.*)

The dried Australian Snake Weed or Cat's Hair.

Uses.—For asthma, bronchial affections, paroxysmal dyspnœa, laryngeal spasm, whooping-cough, angina pectoris, in coryza, and hay fever. It appears to act directly and solely on the respiratory and cardiac centres.—L. ii./91, 505. Constituents of.—P.J. ii./05,414.

Decoctum Euphorbiæ Piluliferæ.—1 in 40.

Dose.—2 ounces (60 Cc.) twice daily.

Extractum Euphorbiæ Piluliferæ (Aqueous).

Dose.—½ to 1½ grains (0·032 to 0·1 Gm.).

Tinctura Euphorbiæ Piluliferæ, B.P.C.

1 in 5 of proof spirit.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

FEL BOVINUM PURIFICATUM.

Purified Ox Bile (*Off.*). U.S.

Dose.—5 to 15 grains (0·32 to 1·0 Gm.).

A dark greenish brown mass of extract consistence, having a bitter-sweet taste.

Soluble in water and alcohol 90%, insoluble in ether.

Manufactured by evaporating 20 of fresh ox bile to 5, mixing with 10 of alcohol 90%, separating the precipitate and evaporating the clear fluid to thick extract consistence. It is composed of bile salts, cholesterin, lecithin and bile pigments. It is best given in keratin-coated pills or capsules.

The fresh bile is also official in U.S.

Uses.—An emulsifier of fat and a stimulant to the action of the liver. A small quantity diluted with water may be used as an enema in obstinate constipation. Pig's gall has also been used. The bile of venomous snakes is said to act as antidote to their poison.

Fel Bovinum Exsiccatum.—A dry powder given in doses of 5 to 10 grains in cachets.

Capsules of Fel Bovinum contain 5 grains each.

Tablets, Keratin-coated, contain 5 grains.

FERRUM (*Off.*).

Fe=55·6 (55·9 I. Wts.).

The element iron is tetravalent, but the Fe atom occurs in compounds, apparently either as di- or tri-valent —the explanation by some chemists is that there are present "double atoms" held together either by 2 or by 1 linkage.

Iron salts may thus be either Ferrous, in which they are traceable to the oxide FeO and contain $\begin{matrix}Fe=\\ \|\\ Fe=\end{matrix}$

or

they are Ferric, which refer to the ferric condition as in Fe_2O_3 (ferric peroxide or sesquioxide) containing $\begin{matrix}Fe\equiv\\ |\\ Fe\equiv\end{matrix}$

Ferrum Redactum (*Off.*). *Syn.* QUEVENNE'S IRON.

Dose.—1 to 5 grains (**0.065 to 0·32 G.m.**)

Fine powdered iron containing at least 75% metallic iron, prepared by reducing ferric hydroxide heated to redness, by a stream of dry hydrogen. U.S. requires 90% metallic iron.

Incompatible with tannin and metallic salts.

Considering the fact that the human body contains only about 39 grains of iron, to give large quantities, *e.g.*, 6 to 10 gains of reduced iron *per diem*, is futile.—H.

Umney discusses the testing of reduced iron for arsenic and suggests a new test with limit 1 in 2,000.—P.J. ii./04,500.

The Royal Commission on Arsenical Poisoning recommended the limit of 60 parts per million.

Pills of Reduced Iron require $\frac{1}{6}$ to $\frac{1}{3}$ grain Compound Tragacanth powder to bind them.

Trochiscus Ferri Redacti contain 1 grain in simple basis.

Ferri Bromidum, Ferrous Bromide.

$FeBr_2$, $6H_2O$=321·58 (323·916 I. Wts.) (Fe_3Br_8, Newth=801·6 (807·38 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Prepared by the direct combination of bromine with metallic iron in the presence of water, and evaporating the solution till, when cooled, it will solidify. In greyish-white deliquescent masses, which, on exposure to the air, acquire a brown colour from oxidation.

Syrupus Ferri Bromidi, B.P.C.

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

Dissolve sugar 14 ounces in 6 ounces of water. Place iron wire, $\frac{1}{2}$ ounce, with 4 ounces of water into a

pint flask and surround it with cold water. Then add bromine 533 grains in successive quantities; shake occasionally until the froth becomes white, and the reaction is complete. Filter the solution into the warm syrup, and add, if necessary, distilled water *q.s.* to 1 pint.

Each drachm contains about 4½ grains of ferrous bromide. The U.S. 1890 syrup contained 10%.

Syrupus Ferri Bromidi cum Strychnina.

Dose.—1 drachm = $\frac{1}{64}$ grain Strychnine and about 4½ grains of Ferrous Bromide.

Strychnine 1, Diluted Hydrobromic Acid 60, Distilled Water 250; dissolve and add Syrup of Ferrous Bromide to 3,500.

In one drachm of this syrup one grain of acid quinine hydrobromide is dissolved to form :—

Syrupus Ferri Bromidi cum Quinina et Strychnina, B.P.C.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Syrupus Ferri Bromidi cum Quinina, B.P.C.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Prepared as the last, omitting the Strychnine.

Ferri Carbonas Saccharatus. (*Off.*).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

Ferrous oxycarbonate, $x FeCO_3\ y Fe(OH)_2$, partially oxidized and mixed with sugar, the mixture containing about one-third of its weight of anhydrous carbonate $FeCO_3 = 115{\cdot}15$ (115·9 I. Wts.).

U.S. requires not less than 15%, and prepares by precipitation of ferrous sulphate with sodium bicarbonate *vice* ammonium carbonate (*Off.*)

Saccharas Ferricus, Ph. Ned., contains at least 3% Iron.

Incompatible with tannin-containing drugs, also with acids and acid salts.

Ferri Carbonas Saccharatus Concentratus.

Four times as strong as the U.S. preparation, *i.e.*, containing about 60% of Ferrous Carbonate. Can be made by U.S. method, but adding 5% Glucose at end of the process instead of the 80% of Cane Sugar. Is useful for capsule and pill making.—P.J. ii./05,134.

Uses.—Preparations of Ferrous Carbonate are the best means of treatment for anæmia and the chlorosis of

young women. The dose may be increased up to 10 grains daily of Anhydrous Ferrous Carbonate.

Capsules and Tablets of Saccharated Iron Carbonate, contain 5 grains (0·32 Gm.).

Pilula Ferri Carbonatis (B.P. 1885). Saccharated Iron Carbonate 4, Confection of Roses 1.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Better made with simple syrup.

Pilula Ferri (*Off.*). *Syn.* BLAUD'S PILL.

Dose.—5 to 15 grains (0·32 to 1 Gm.).

Exsiccated Ferrous Sulphate 15, Exsiccated Sodium Carbonate 9·5, Gum Acacia 5, Tragacanth 1·5, Syrup 15, Glycerin 1, Distilled Water 2, or *q.s.* Mix the Syrup, Glycerin and Water, add the Iron, and then quickly the Sodium Carbonate, mix thoroughly. Set aside 15 minutes, or until the reaction is complete; add the gums and incorporate thoroughly. If divided into 5-grain pills, each contains about 1 grain of Ferrous Carbonate.

With official sanction a little Reduced Iron could be added to prevent oxidation.—P.J. ii./03,916.

Glucose instead of glycerin and syrup makes a pill with better keeping qualities.—C.D. i./05,464.

The employment of sodium bicarbonate in place of the carbonate, together with plenty of water, a little honey and gum acacia, produces a pill which will keep unoxidised for a long time.—C.D. i./05,793; P.J. i./05,765.

Massa Ferri Carbonatis, U.S.

Average dose.—4 grains.

Dissolve Ferrous Sulphate crystals 100 in 200 of boiling distilled water and add Syrup 20. Dissolve separately Sodium Carbonate (dried) 46 in 200 of boiling water, filter each and allow to cool. Add the alkaline solution to the Ferrous Sulphate solution with care. Set aside well covered to subside. Pour off the supernatant liquor and wash the precipitate with diluted Syrup (1 in 20), collect on muslin and mix with Honey 38 and Sugar 25, and evaporate on water bath to 100. Contains about 40% Ferrous Carbonate.

Blaud Pill Estimation.

The white or other coatings having been carefully removed the weight of two pills should be carefully noted. They are dissolved in a beaker in a small quantity of water, say 15 Cc. with sulphuric acid 5 Cc. Decinormal solution of potassium bichromate (4·87 Gm. in 1,000 Cc.) is then run in until a drop of the solution no longer gives a blue colour with drops of

potassium ferricyanide solution arranged on a white tile. Multiply the number of Cc. of Bichromate solution used by 0·0115 to obtain the amount of ferrous carbonate in grammes in the two pills.

Capsules of Blaud Pill each equal to 5 grains of the official pill are also prepared.

Pilulæ Ferri Carbonici. P. Austr., and **Pilula Ferri Carbonici Blaudii.** P.G. iv., are made with Potassium instead of Sodium Carbonate.

Tablets, 4 and 8 grains. *Dose.*—1 to 4 four-grain, or 2 eight-grain Tablets, also made 4 gr. with Arsenious Acid $\frac{1}{64}$ grain. *Dose.*—1 to 4.

Capsules are also made in the following combinations:

Blaud Pill 5 grains with Aloes $\frac{1}{2}$, or 1 grain.
" " 5 grains with Arsenic $\frac{1}{100}$, $\frac{1}{50}$, $\frac{1}{30}$ grain.
" " 5 grains with Cascara Extract, 3 grains.
" " 5 grains with Cod Liver Oil, $\frac{1}{2}$ dr.
—B.M.J. ii./05,1398.
" " 5 grains with Iron Arsenate, $\frac{1}{8}$ grain.
" " 5 grains with Nux Vomica Extract, $\frac{1}{4}$ grain.
" " 5 grains with Quinine Sulphate, 1 grain.

Ferri Citras, U.S.

Average dose.—4 grains (0·26 Gm.).

Contains ferric citrate corresponding to not less than 16% metallic iron. Garnet red scales with slight ferruginous taste. Soluble in water.

Ferri et Ammonii Citras. (*Off.*) **U.S.**

Dose.—5 to 10 grains (0·32 to 0·65 Gm.). Yields 31% or 32% ferric oxide. (*Off.*) Contains 16% metallic iron (U.S.). Dark red scales soluble in about half their weight of water.

Ferri Hydroxidum, U.S.

The Hydroxide precipitated from 100 Cc. of Solution of Ferric Sulphate by Ammonia Solution 138 Cc., washed and mixed with water *q.s.* to 300 Gm.

Mistura Ferri Composita (*Off.*). *Syn.* GRIFFITHS MIXTURE.

Dose.—$\frac{1}{2}$ to 1 ounce (15 to 30 Cc.).

Ferrous Sulphate 5, Potassium Carbonate 6, Myrrh 12, Sugar 12, Spirit of Nutmeg 9, Rose Water *q.s.* to 875. The mixture is best kept of double strength, and the iron salt (2½ grains to each ounce) added when dispensed.

Ferri Perchloridum.

$Fe_2Cl_6,12H_2O$=536·90 (540·692 I. Wts.).

Ferric Chloride, U.S. Should contain not less than 22% metallic iron in the form of chloride.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

This salt is prepared by carefully evaporating the stronger official solution and setting aside to crystallize. It is in pale orange-yellow opaque crystalline masses, very deliquescent, and entirely soluble in water.

The official preparations of Ferric Chloride are:—Liquor Ferri Perchloridi, *dose*, 5 to 15 minims; Liquor Ferri Perchloridi Fortis, *dose*, 1 to 4 minims; and Tinctura Ferri Perchloridi, *dose*, 5 to 15 minims. The Tincture composed of Strong Liquor 1, Alcohol (90%) 1, Water *q.s.* to 4, is the most generally used.

Incompatible with infusions &c., containing tannin, with the alkalis, alkaline carbonates, iodides, salicylates and mucilage of acacia. Ferric Chloride with Potassium Iodide in presence of Potassium Citrate produce a Potassium Ferricitrate and hence compatible.—P.J. ii./05,862.

Uses.—The most valued preparation of iron in anæmia, chlorosis, and as a general tonic, also to arrest internal passive bleeding, and has been given in erysipelas and acute rheumatism. The Strong Liquor is generally employed topically as a styptic or pigment, as for post-partum hæmorrhage and for some forms of rhinitis,—for this purpose, it has the disadvantage of containing a little more free acid than chemically neutralises the iron as perchloride. As a hæmostatic, therefore, the solid crystallized perchloride of iron containing 12 molecules, 40% of water, or a strong solution of it, is preferred.

The perchloride is the most diuretic preparation of iron.—H.

Iron decreases the elimination of uric acid, which may account for the production of headache in rheumatic patients under its influence.—H. Its administration may bring on an attack of gout.—W.W.W.

A **Liquor Ferri Perchloridi Fortis** of B.P. Sp. Gr. 1·42 may be made by dissolving Ferric Chloride, with 12Aq. 5 parts, in Distilled Water 2 parts.

T. H. orders for **Nebula Ferri Perchloridi**, 5 grains; for **Pigmentum Ferri Perchloridi** 60 grains to 120 grains of this salt to each ounce of solution.

Glycerinum Ferri Perchloridi, G.H., U.C.H. have Ferric Chloride 1, Glycerin 4. For use as a paint. **Mid. H.** has Liquor Ferri Perchloridi 1, Glycerin 1.

Glycerin and chloroform water cover its metallic astringent taste. But the mixture may darken in colour, owing perhaps to a partial dissociation of the iron salt. —B. & C.D. i./05,103.

Löffler's Pigment for Diphtheria.

Menthol 10, Toluol *q.s.* to 36, Ferric Chloride Solution 4, Absolute Alcohol to 100. To apply on wadding every 3 hours. Sometimes Creolin 2% is added. The pigment is, however, painful in use. Dilute hydrogen peroxide is preferable.

'Collapsubes' with rectal tube contain Ferric Perchloride 1 in 40 with vaseline basis for piles.

Gossypium Stypticum, Absorbent Styptic Wool. Contains 15% Ferric Chloride.

R.D.H. has Alum 2 drachms dissolved in water 1½ ounces, to which is added Solution of Ferric Chloride 2 drachms, distributed evenly through absorbent cotton 1 ounce. In **Ph. Ned.** Gossypium Stypticum contains at least 2% Quinine Hydrochloride.

Liquor Ferri Perchloridi Fortis (*Off.*). Contains 22·5 Gm. Fe (= 65·2 Fe_2Cl_6) in 100 Cc. Has Sp. Gr. 1·42. 5 Cc. precipitated with excess of ammonia yields 1·6 Gm. of Oxide. **Ph. Ned.** 75% Fe_2Cl_6. 'Liquor Stypticus.'

Liquor Ferri Perchloridi (*Off.*).

Dose.—5 to 15 minims (0·32 to 1 Cc.).

Contains 5·63 Gm. Fe(= 16·3Fe_2Cl_6) in 100 Cc. Strong Solution of Ferric Chloride 1, Water to 4.

Liquor Ferri Chloridi. U.S.

Average dose.—1½ minims. (0·1 Cc.)

Contains 29% = to 10 Gm. Fe in 100 Gm. (instead of 37·8% anhydrous ferric chloride = 13 Gm. Fe in 100 Gm. in 1890, U.S.').

In septicæmia—in the first 24 hours 4 drachms of the official liquour divided in 12 doses; for the second 24 hours 6 drachms; for the third 1 ounce. All cases were successful.—L. ii./04,1248.

Tinctura Ferri Perchloridi (*Off.*)

Dose.—5 to 15 minims (0·32 to 1 Cc.)

Strong solution of Ferric Chloride 1, Alcohol 90%.

1, Water to 4 (16·3 Gm. Anhydrous Ferric Chloride in 100 Cc. approximately).

Owing to the fact that ferric chloride does not remove any of the acid of the gastric juice (as when reduced Iron or Blaud's Pills are given), this is preferred by many.

Thread worms are killed by rectal injection of a drachm of the Tincture in 10 ounces of water.

Its effect in some forms of blood poisoning may be due to the chlorine present in it. Similarly chlorine in diphtheria and scarlet fever.—L. ii./04,1178, 1415.

In erysipelas 15 to 20 minims every 2 hours arrests progress of the disease.—L. ii./04,1313.

Tinctura Ferri Chloridi, U.S. *Average dose.*—8 minims.

Solution of Ferric Chloride (U.S.) 7, Alcohol to 20. Contains 13·28 Anhydrous Ferric Chloride (=4·6% Fe.).

Tinctura Nervina, Bestucheffi, Ph. Ned. Solution of Ferric Chloride (75% Fe_2Cl_6) 1, Alcohol 90% 6, Ether 3.

Tinctura Ferri Muriatis, Ed. P.

Syn. TINCTURA FERRI SESQUICHLORIDI. P.L.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.). Sesquioxide of Iron (prepared by precipitation of ferrous sulphate with Sodium Carbonate 6 ounces, Hydrochloric Acid 1 pint. Digest three days; add Alcohol 90% three pints, and filter. Contains some Ferrous Chloride, when fresh, and is preferred by some practitioners.

Tinctura Ferri Chlorati Ætherea. P.G. iv. Liquor Ferri Sesquichlorati (= Perchloride) (Sp. Gr. 1·28) 1, Ether 2, Alcohol 7. Contains 1% Fe. Sp. Gr. 0·850 to 0·860.

Mistura Ferri Amara. U.C.H.

Solution of ferric chloride 30 minims, chloroform emulsion 1 minims, infusion of quassia to 1 ounce.

Mistura Ferri Aperiens. U.C.H.

Magnesium sulphate 30 grains, ferrous sulphate 2 grains, diluted sulphuric acid 2 minims, peppermint water to 1 ounce. An excellent mixture for the cure of inebriety.

Mistura Ferri Arsenicalis. U.C.H.

Citrate of iron and ammonium 8 grains, arsenical solution 1 minims, tincture of calumba 30 minims, water to 1 ounce. *Dose.*—½ to 1 ounce.

Mistura Ferri Perchloridi. U.C.H.

Solution of ferric chloride 15 minims, glycerin 5 minims chloroform water to 1 ounce.

Mistura Ferri Salina. U.C.H.

Potassium citrate 22 grains, solution of ferric chlorid 4 minims, chloroform water to 1 ounce. The styptic tast of iron is masked in this mixture, as a double decompositio occurs between the iron and the potash salt. If to 30 minim of the solution of ferric chloride 15 minims of the solution ammonium citrate be added, its styptic taste is effectuall disguised.

Mixtura Ferri Laxans. St. M.'s H.

Ferrous sulphate 3 grains, magnesium sulphate 1 drachm dilute sulphuric acid 5 minims, peppermint water to 1 ounce

Liquor Ferri Chloroxidi.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

Contains, it is said, a basic ferric chloride of th formula Fe_2Cl_6 $7Fe_2O_3$.

Strong Solution of Ferric Chloride 4, Distille Water 40. Mix, and add in excess, Solution Ammonia, *q.s.*; collect, wash well the precipitate, stir and dissolve it with a gentle heat in Strong Solution o Ferric Chloride 1, Distilled Water *q.s.*, to make whe filtered 20.

Liquor Ferri Oxychlorati, P.G., is about one third weaker than the above.

This is a basic solution of Ferric Chloride, of the sam strength as the tincture. By placing this solution o a septum floating in water, it may be further free from chloride, and rendered less styptic in taste, formin

Liquor Ferri Dialysatus (B.P. 1885).—Sp. Gr 1·047. *Dose.*—10 to 30 minims (0·6 to 1·8 Cc.).

The last two preparations, made as directed, are dar reddish-brown in colour, and contain about 5% o ferric oxide. The strength of the latter will be slightl variable as some of the iron passes through the septum

These two preparations of iron are useful when th strong acid preparations of iron cannot be borne b the stomach, but they are compatible with few othe medicines, they will not bear dilution with commo water, or with much distilled water without depositin the oxide. They ought, therefore, to be supplied to th patients as "drops," undiluted, or mixed with glycerin

Glycerinum Ferri Dialysati.

Dialysed Iron Solution 1, Glycerin 2. Keeps wel and is palatable. *Dose.*—1 drachm (3·5 Cc.).

Dialysed iron is useful as an antidote to arsenic—muc superior to the moist peroxide; 1 ounce doses should b

given repeatedly, preceded by a dose of common salt or sodium bicarbonate, *see also p.* 142.

Ferrum Oxydatum Saccharatum, P. Austr., P.G. iv. Saccharated Ferric Oxide.

Dose.—10 to 40 grains (0·65 to 2·6 Gm.).

Sodium carbonate 15, dissolved in water 30, to this gradually add ferric chloride solution 30, cold distilled water, 600; mix with the above sodium carbonate 15 dissolved in water 600. Set aside, decant, wash the precipitate, collect and press gently, mix in a porcelain dish with sugar 25, soda ley (Sp. Gr. 1·17) 3. Heat in a water-bath, add sugar 70 and stirring continuously, evaporate to dryness to form a reddish-brown powder. Should contain at least 2·8% of metallic iron.

Rusting of Iron (Moody).—J.C.S.T. Apl., 1906,723.

Liquor Ferri Oxydati Saccharati.

Dose.—½ ounce.

Under this name a solution is sold on the Continent containing about 5% of the above, flavoured with Cinnamon or Vanilla.

Liquor Ferri Pernitratis (*Off.*).

Dose.—5 to 15 minims (0·32 to 1 Cc.).

A reddish brown solution containing ferric nitrate $Fe_2(NO_3)_6 = 480{\cdot}68$ (484·04 I.Wts) Sp. Gr. 1·107, contains 3·3% Fe. *Uses* similar to those of the solution of the perchloride.

Vinum Ferri. (*Off.*). *Dose.*—1 to 4 drachms (3·5 to 15 Cc.). Iron Wire 1, almost entirely immersed in Sherry 20.

Vinum Ferri Citratis (*Off.*). *Dose.*—1 to 4 drachms. Iron and Ammonium Citrate 18·3, Orange Wine to 1,000.

Vinum Ferri, U.S. *Average dose.*—2 drachms. Iron and Ammonium Citrate 4, Tincture of Sweet Orange Peel 6, Syrup 10, White Wine to 100.

Vinum Ferri Amarum, U.S. *Average dose.*—2 drachms. Soluble Iron and Quinine Citrate 5, Tincture of Sweet Orange Peel 6, Syrup 30, White Wine to 100.

Carniferrin and **Ferratin.** German specialties.

Dose.—8 to 15 grains (0·52 to 1 Gm.).

Prepared from meat and iron; are tasteless brown powders; have been used in anæmia and chlorosis.

Triferrin. *Syn.*—Ferri Nucleinas, Ferrinol.

Dose.—15 grains *per diem* after meals in divided doses.

A brownish powder insoluble in water. Said to contain 21% of Iron and nearly 3% of Phosphorus. Is given in anæmia, chlorosis and in phthisis.—B.M.J.E. i./04,44.

Liquor Ferri Albuminati (after Dieterich; *Liquids to be weighed*). Same strength as P.G. iv. *Dose.*—1 to 4 drachms (3·5 to 15 Cc.).

Dissolve dried egg albumin 30 in water 4,000 at 50°C. and add to solution of chloroxide of iron 120 mixed with water 4,000 at 50° C.; neutralise the mixture with diluted soda solution; collect precipitate, and wash till free from chloride with water at 50°C.; then transfer it to a tared bottle, and dissolve in soda solution 18·3; add alcohol (90%) 160 diluted with cinnamon water 90; finally add water to 1,000. Contains about 4 of iron in 1,000. Is easily digested and borne by a delicate stomach.

Liquor Ferri Peptonati (after Dieterich; *Liquids to be weighed*). *Dose.*—1 to 4 drachms (3·5 to 15 Cc.).

Dissolve dried egg albumin 10 in distilled water 1,000; add to this pepsin 0.5 and hydrochloric acid 14. Digest the mixture for 12 hours at 40 °C. (104° F); cool and neutralize with solution of soda; then add solution of chloroxide of iron 120 diluted with distilled water 1,000. Again neutralize exactly with diluted soda solution, collect and wash, precipitate free from chloride.

Transfer to a tared bottle and dissolve in hydrochloric acid 1·17, warming slightly, add simple syrup 10, compound tincture of cinnamon 10, alcohol (50%) 150, and distilled water to 1,000. This solution is clear by transmitted light but opaque by reflected light.

Ferrum Peptonatum in scale form can be produced by digesting egg albumen with pepsin and dilute hydrochloric acid at 39°C. The peptone solution is neutralised and added to solution of chloroxide of iron. The precipitated peptonate is dissolved in water with a little hydrochloric acid—the solution is evaporated and 'scaled' in the customary manner.

Ovoferrin. IRON-VITELLIN. *Dose.*—2 drachms.

This brown liquid claims to contain a new form of organic iron. A hæmatinic tonic.—Pr. lxxiii., 154.

Liquor Ferri Peptonati cum Quinina.

Dose.—1 to 4 drachms (3·5 to 15 Cc.). Contains ½% of Quinine Hydrochloride.

Liquor Ferro-Manganesii Peptonati.

Dose.—1 to 4 drachms (3·5 to 15 Cc.). Contains, in addition to Iron, 0·1% of Manganese.

Extractum Ferri Pomatum is prepared by digesting iron filings in juice of sour apples.

Tinctura Ferri Pomata, P.G.

Dose.—15 to 30 minims (0·9 to 1·8 Cc.).

Ferrated Extract of Apples 1 part, Cinnamon Water (P.G., containing 10% of alcohol) 9 parts.

Liquor Ferri Acetatis (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Ferric hydrate is precipitated by means of excess of

ammonia from solution of ferric sulphate 5, diluted with water 40; it is washed, drained, squeezed, and lastly dissolved in glacial acetic acid 3, and water added *q.s.* to 40; after standing, decanted.

This solution does not decompose iodides.

Pneumonia treated with full doses every six hours until crisis past.—B.M.J. i./05,1024; C.D. i.05,756.

Tinctura Ferri Acetatis, B.P. 1885, was same strength. *Dose.*—5 to 30 minims (0·3 to 1·8 Cc.).

Liquor Ferri et Ammonii Acetatis, U.S. Basham's Mixture. *Average dose.*—4 drachms (16 Cc.).

Tincture of Ferric Chloride 4, Dilute Acetic Acid 6, Solution of Ammonium Acetate 50, Aromatic Elixir 12, Glycerin 12, Water to 100 (was 2 Cc. in 100 Cc. in 1890, U.S.P.). To be freshly made. Particularly useful in anæmia and chronic parenchymatous nephritis. It acts as a good diuretic and diaphoretic.—H.

Ferri Iodidum. FeI_2=307·4 (309·84 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Crystalline brown hygroscopic masses readily soluble in water. Mostly prescribed as one of the following:—

Syrupus Ferri Iodidi (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Contains Ferrous Iodide 1 in 10 (1 gr. in 11 m.), and is slightly stronger than B.P. 1885. Iron Wire 25, Iodine 83, Sugar 825, Water to 1,000.

Instead of boiling the syrup to cause formation of some glucose (which has preservative action) it has been suggested to add 6 drachms of syrup of glucose to each pint of syrup in the cold.

C.U.D. proposes 5% anhydrous ferrous iodide. U.S. has this (was 10% in 1890). Reduced to conform with other Pharmacopœias.

Incompatible with Sal Volatile and with Easton's Syrup—strychnine iodide, and perhaps quinine iodide thrown out.—P.J. i./05,263,268.

Capsules are prepared each equivalent to 10 and to 30 minims of the syrup.

Liquor Ferri Iodidi. *Dose.*—3 to 6 minims (0·18 to 0·35 Cc.).

The above *sine* sugar. 10 minims are equivalent to 1 drachm of the Syrup.

Pilula Ferri Iodidi (B.P. 1885).

Dose.—3 to 8 grains (0·2 to 0·52 Gm.).

Shake carefully in a stoppered bottle Iodine 80, Water 46, with Iron Wire 40; add decanted Solution to Sugar 70; mix and combine with Liquorice Powder 140. In dividing this into pills, roll them in a mixture of reduced iron and lycopodium, and varnish.

Pilula Garrodii, N. H. W.

Pill of Ferrous Iodide 2 grains, Exsiccated Sodium Arsenate $\frac{1}{36}$ grain, Extract of Belladonna $\frac{1}{2}$ grain.

Ferri Oxalas, $Fe(COO)_2\,2H_2O = 178{\cdot}7$ (179·932 I. Wts.). *Syn.*—FERROUS OXALATE, PROTOXALATE DE FER. Is official in **F.E.**

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Yellow crystalline powder, insoluble in water but soluble in dilute acids. Has been given in anæmia and as a nerve tonic.

Ferri Phosphas. Iron Phosphate (*Off.*).

$Fe_3(PO_4)_2, 8H_2O = 498{\cdot}48$ (501·828 I. Wts.)

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

A slate-blue amorphous powder containing at least 47 % of ferrous phosphate, with ferric phosphate and oxide.

The precipitate by the B. P. method is Di-Ferrous Phosphate.—C.D. i./05,792.

Ferri Phosphas Solubilis, U.S., is a soluble sodio-citro-ferric phosphate. Contains Ferric Phosphate corresponding to 12 % metallic iron.

Syrupus Ferri Phosphatis (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.). One drachm contains 1 grain of anhydrous ferrous phosphate. It is best kept in bottles quite full.

Syrupus Ferri et Manganesii Phosphatum.

May be made by dissolving ½ grain (0·032 Gm.) manganese phosphate in each drachm of the last.

Syrupus Ferri Phosphatis Compositus, B.P.C.

Syn. CHEMICAL FOOD; PARRISH'S SYRUP (*modified*).

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Iron Wire, free from oxide 37½ grains, Concentrated Phosphoric Acid, Sp. Gr. 1·5, 1 ounce, Distilled Water 5 drachms. Place in a glass flask, so that the liquid completely covers the wire, plug with wool, and heat gently till dissolved.

Mix Precipitated Calcium Carbonate 120 grains, Concentrated Phosphoric Acid 4 drachms, Distilled Water 2 ounces, and add Potassium Bicarbonate 9 grains, Sodium Phosphate

9 grains. Then add the solution of phosphate of iron, filter and set aside.

Boil Cochineal 30 grains with distilled water 7½ ounces 15 minutes, cool and filter, pouring over the filter sufficient water to produce 7 ounces. To this add refined sugar 14 ounces.

Heat till dissolved and strain. When cold, add the solution of phosphates, and sufficient water to measure 1 pint.

Contains in each drachm ½ grain Ferrous Phosphate and ⅛ grain Phosphate of Calcium, with small quantities of the phosphates of potassium and sodium. It should be kept in bottles quite full. A small proportion of glucose added, assists keeping qualities. It is not too nauseous to administer to children, for whom it is frequently prescribed.

One drachm doses, thrice daily, with increasing doses of cod liver oil, for "recurrent" abortion.—M.A. 1904,99.

Capsules of Chemical Food are each equivalent to 1 drachm of the above syrup.

Syrupus Ferri Phosphatis cum Quinina et Strychnina. (*Off.*).

Syn. EASTON'S SYRUP (*modified*), SYRUPUS TRIUM PHOSPHATUM.—G.H.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).—One drachm represents 1 grain of anhydrous ferrous phosphate, ⅘ grain Quinine Sulphate, and $\frac{1}{3\frac{1}{2}}$ grain Strychnine. As this syrup becomes discoloured it is more satisfactory to make only small quantities at a time.

The acid liquor is officially filtered into the syrup, and afterwards made up to a pint. If the solution is made up to about 6 ounces, filtration is much more rapid, and exposure to air less.—C.D. i./05,464.

Equal parts of glucose syrup and syrup produce a preparation—with much better keeping qualities.—C.D. i./05,709. A sample made by us by this modification was under observation for four months, at end of which time it was clear, and had not turned brown. But similarly, a batch of Easton Syrup during the same time had not materially darkened.

The original formula was published in Aitken's Practice of Medicine, vol. ii. p. 62, 5th ed. U.S. employs Glyceritum Ferri, Quininæ et Strychninæ Phosphatum 25, *q.v.*, Syrup to 100. *Average Dose.*—1 drachm (4 Cc.).

It is intended to be extemporaneously mixed as it is impossible to prevent darkening owing to action of the acid on the sugar.—Caspari.

Liquor pro Syrupo Eastoni. 3 with 7 of Syrup = **Easton's Syrup** (*i.e.* 144 minims with Syrup *q.s.* to 1 ounce) (*not to be confounded with Liquor Quininæ et Strychninæ in the 10th Edition*).

Add to a Solution of Ferrous Phosphate 5 ounces (produced by dissolving Iron Wire 150 grains in Phosphoric Acid, Sp. Gr. 1·5, 2¼ ounces and water *q.s.*

to 5 ounces), one of Strychnine 10 grains, and Quinine Sulphate 260 grains, in Phosphoric Acid warmed, 2 drachms; mix, and add water *q.s.* to 12 ounces. Is better recently prepared. The Solution of Ferrous Phosphate keeps for a moderate time in stoppered bottles.

Syrupus Triplex. Understood to mean a mixture of equal parts of Easton's, Fellows's and Parrish's Syrups.

Elixir Ferri Phosphatis cum Quinina et Strychnina.—Martindale.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Prepare as the Syrup, using Simple Elixir in place of Syrup as a vehicle.

Elixir Ferri, Quininæ et Strychninæ Phosphatum., U.S.

Average dose.—1 fluidrachm (4 Cc.).

Dissolve Quinine 8·75 Gm. and Strychnine 0·275 Gm. in Alcohol 60 Cc., then add Phosphoric Acid 2 Cc. and Aromatic Elixir 350 Cc. Dissolve Ammonium Carbonate 9 Gm. in Acetic Acid 28·65 Gm. Neutralize with ammonia solution, dilute to 50 Cc. with water; mix the solutions, and add Aromatic Elixir to 880 Cc. Dissolve Ferric Phosphate 17·5 Gm. in water 30 Cc., neutralize with ammonia if acid, and add Aromatic Elixir to 120 Cc. Finally mix the two solutions and filter if necessary.

Physicians should carefully distinguish whether the first or the second (U.S.) preparation is to be used, as the first contains double the quantity of strychnine.

Easton's syrup has its equivalent dose in the following pill, which is portable, tasteless, and readily soluble :—

Pilula Ferri Quininæ et Strychninæ Phosphatum. EASTON'S PILLS.

Ferrous Phosphate ...	16 grains	(1·065 Gm.)
Quinine Sulphate	16 grains	(1·065 Gm.)
Strychnine	½ grain	(0·032 Gm.)
Milk Sugar	20 grains	(1·25 Gm.)

Concentrated Phosphoric Acid *q.s.*

Mix quickly, having first triturated the strychnine with the Milk Sugar, and divide into 16 pills. Also made one-half this strength. Either may be combined with Arsenious Acid, $\frac{1}{60}$ grain (about 0·001 gramme).

Glyceritum Ferri, Quininæ et Strychninæ Phosphatum, U.S. *Syn.*—**Glycerole Easton.**

This preparation is suggested as a substitute for the syrup for administration where sugar is not desirable. It keeps better than the syrup and is palatable.

Average dose.—15 minims (1 Cc.) containing approximately Soluble Ferric Phosphate 1¼ grain (0·08 Gm.),

Quinine as Phosphate 1½ grain =0·1 Gm., Strychnine base $\frac{1}{60}$th grain= 0·001 Gm. For exact quantities *vide* U.S.P. *p.* 225.

Tablets of Easton's Syrup are each equivalent to ½ and 1 drachm of the syrup. (Plain and sugar coated.)

Capsules equivalent to ½ and 1 drachm of Easton's syrup are also prepared and each **combined with Arsenic $\frac{1}{50}$ grain.**

Pilula Trium Phosphatum, G.H. Is similar to the above with liquorice powder *vice* sugar.

Liquor Ferri Persulphatis (*Off.*).

Ferrous Sulphate 16, Sulphuric Acid 1½, Nitric Acid 1½, Water, *q.s.*, to produce 22. Sp. Gr. 1·441. 5 Cc. yield 1·04 Gm. Fe_2O_3=10·4% Fe.

Liquor Ferri Tersulphatis, U.S., now 36%=not less than 10% Fe instead of 28·7% normal ferric sulphate $Fe_2(SO_2.O_2)_3$=8% Fe in 1890 U.S.P.

Ferri Sulphas (*Off.*), $FeSO_4, 7H_2O$=276·1 (278·072 I. Wts.) and **Ferri Sulphas Granulatus, U.S.** (**Ferrum sulphuricum præcipitatum, P.Austr.**), **Ferrous Sulphate.**

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

In clear, pale, bluish green crystals, soluble 1 in 1·49 of water at 62° F.—P.J. ii./03,881.

A saturated solution with some crystals of the salt in excess keeps better than a weak solution, in the latter oxidation soon takes place.

Relieves anæmia more thoroughly than carbonate or phosphate.—L. i./93,403; M.C. April, 1893,55.

Ferri Sulphas Exsiccatus (*Off.*). *Dose.*—½ to 3 grains (0·032 to 0·2 Gm.) 5 grains = 8 of the above.

Best administered in pill, as :—

Pilula Ferri Sulphatis, 3 or 5 grains, with syrup *q.s.* Dissolving slowly, these pills do not derange the stomach. If made with lanolin or kaolin ointment as excipient will not crack.

Liquor Ferri Subsulphatis, U.S. **Monsel's Solution.**

Dose.—3 to 6 minims (0·18 to 0·35 Cc.).

A solution of basic ferric sulphate. When evaporated and scaled forms **Monsel's Salt** or **Oxypersulphate of Iron.**

A spray of 20 grains to the ounce checks hæmoptysis and internally is not irritating although astringent.

Ferri et Magnesii Sulphas.

$FeSO_4MgSO_4,6H_2O = 377{\cdot}74$ (380·476 I. Wts.).

Dose.—2 to 10 grains (0·13 to 0·65 Gm.).

A double salt containing about half its weight of each sulphate; in sea-green crystals with chalybeate taste, soluble 3 in 4 of water.

In 10-grain doses has no astringent or aperient action, hence suitable for prolonged use in chlorosis and anæmia.

Ferri et Manganesii Citras.

Dose.—3 to 15 grains (0·2 to 1 Gm.).

In reddish-brown scales, freely soluble in water. Useful in chlorosis, combining the action of the two elements.

Ferro-Alumen. Iron Alum. — *Syn.* FERRI ET AMMONII SULPHAS, U.S. $FeNH_4(SO_4)_2+12H_2O = 478{\cdot}78$ (478·69 U.S.; 482·284 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.). 99·5% pure, and to contain not less than 11·5% metallic iron U.S. Amethyst coloured crystals, efflorescent on exposure to the air, odourless, having an acid, styptic taste, and slightly acid reaction. ***Soluble*** 1 in 3 of water (best with a little sulphuric acid added), insoluble in alcohol. Is used internally to arrest hæmorrhage from the kidneys, and employed as an astringent and styptic gargle (8 grains to an ounce), also as a throat spray and pigment.

Ferrum Tartaratum. (*Off.*) FERRI ET POTASSII TARTRAS, U.S. *Dose.*—5 to 10 grains (0·32 to 0·65 Gm.), U.S. *Average dose.*—60 grains.

Reddish brown scales soluble in water about 1 in 1. Prepared by evaporating a solution of Ferric Hydroxide in Acid Potassium Tartrate. 10 Gm. incinerated yield not less than 3 Gm. of residue.

Ferri et Ammonii Tartras, U.S. *Average dose.*—4 grains. Contains not less than 13% metallic iron.

FILIX MAS (*Off.*).

The rhizome of *Aspidium Filix-mas.* The Male Fern.

Acidum Filicicum. Filicic Acid.

Dose.—6 to 15 grains (0·4 to 1 Gm.).

A light, white, amorphous powder, tasteless and

inodorous, soluble in alcohol, oils, and alkalis, insoluble in water. Is the active principle of male fern as an anthelmintic.

Method of estimation in the extract.—P.J. ii./05, 270,580. Is manufactured as a crystalline compound of formula $C_6H_3\begin{cases}(O.C_4H_7O)_2\\OH\end{cases}$ =264·14 (266·144 I. Wts.)

Oleoresina Aspidii, U.S., prepared by acetone percolation, is directed to be thoroughly mixed before use; a granular crystalline substance usually deposits. The yield is as much as 18%.—Caspari

Extractum Filicis Liquidum (*Off.*).

Dose.—45 to 90 minims (**2·7 to 5·3 Cc.**).

Prepared by ether extraction.

For all varieties of tapeworm and the *ankylostomum duodenale* should be administered fasting, in capsules, or emulsified with about half its weight of compound tragacanth powder. This and the anthelmintics below should be preceded and followed by a dose of some brisk purgative. The extract is best recently prepared.—B.M.J.E.i./06,64.

Fresh drug of last season's growth.—P.J., July 28 06.

Capsules contain 15 minims (**0·9 Cc.**) of Liquid Extract. *Dose.*—1 to 4.

Haustus Filicis Maris, L.H. Liquid Extract of Male Fern, 1 drachm; Syrup of Ginger, 1 drachm; Tincture of Quillaia, ½ drachm; Water to 1½ ounces.

Mistura Filicis, U.C.H. *Dose.*—1 ounce.

Liquid Extract of Male Fern 1 drachm, Powdered Acacia 1 drachm, Chloroform Water to 1 ounce.

Filmaron is a proprietary preparation made from Male Fern.—Jl. Trop. Med. 1904,64; B.M.J.E. i./06,64.

Other tæniacides are **Cusso, Kousso** (*Off.*) (U.S.), the dried pistillate flowers of *Brayera anthelmintica* (*Rosaceæ*), which are administered fasting in dose of ¼ to ½ ounce infused in a cup of boiling water without straining and swallowed; **Kamala** (now discarded from B.P.), the glandular red powder attached to the capsule of *Rottlera tinctoria; Mallotus Philippinensis* (*Euphorbiaceæ*); this may be given in dose of 30 to 120 grains suspended in water by means of mucilage or in honey or gruel; **Cowhage, Dolichos Pubes**, the hairs adhering to the pod of *Dolichos* or *Mucuna pruriens* (*Leguminosæ*), *dose* 1 or 2 grains in treacle or honey;

Papain, and **Thymol Carbonate,** *q.v.*, but the most efficient tæniacide is **Pelletierine Tannate,** *q.v.*

Ankylostomiasis treated by anthelmintics.—L. ii./04, 1636.

FOODS.

Foods may be classified as follows:—

1. **Proteids.** (*a*) free and (*b*) combined.
   (*a*) These include the Albumins and Globulins and the results of proteolysis of these, viz., Albumoses and Peptones.
   (*b*) These contain Hæmoglobin, which is an albuminous compound with a complex iron body; Glycoproteids, which are compounds of proteids with carbohydrates; Nucleoproteids, which are compounds of proteids and Nucleic Acid, which latter is an organic compound of Phosphoric Acid.
   The decomposition of proteids produces the nitrogenous extractives, *i.e.*, Urea, Purin or Alloxuric bodies, such as Xanthin, Hypoxanthin and Uric acid, Creatin and Creatinin.
2. **Fats.** This group of proximate principles of the tissues, is represented by the glycerides, triolein, tripalmitin and tristearin (*v.p.* 641). Here is to be included also Lecithin, which on hydrolysis yields glycerophosphoric acid and Choline—the latter is an alkaloid allied to Neurine, and when in excess is a sign of nervous tissue degenerating and will produce toxic symptoms when existing in quantity in excess of the amount which can be oxidised into urea.
3. **Carbohydrates.** These may be in part decomposition products of the proteids and in part material about to be dealt with by the bioplasm; they are Monosaccharides, $C_6H_{12}O_6$ (Glucose, Galactose, and Mannose), Disaccharides $C_{12}H_{22}O_{11}$ (Cane Sugar, Milk Sugar, and Maltose), Polysaccharides $(C_6H_{10}O_5)_n$ (Glycogen, Starch, and Cellulose). They are all converted into glucose in the body, whilst they are also stored up as glycogen or animal starch pending metabolism in the liver, muscles, &c.—"Nutrition and Malnutrition."—Allchin, L.i./05, 1111.

Carbohydrate Metabolism (Pavy). — L.i./05,1704; ii./05, 4, 342.

The amount of proteid or albuminoid food needed daily for the actual physiological want of the body is not more than half that ordinarily consumed by the average man.

A diet of low proteid value is strongly recommended for the average healthy man and for those suffering from arterio-sclerosis.—B.M.J.i./06,123.

Some Strange Foods—Agar, Seaweeds, &c.—L.i./05, 1524.

Proprietary foods for infants are, unfortunately, too often only impositions upon a credulous public.—L.i./06, 98.

Metabolism experiments and treatment of diseases.—L.i./06,1154.

Preparations of Meat and Blood

Extractum Carnis.—*Syn.* LIEBIG'S EXTRACT; LEMCO. It contains little or no albuminous principles or gelatin, but consists of creatin, creatinin, globulin, and urea, with organic potash and other salts. A food for invalids and healthy persons; is added to soups, beef-tea, &c., and it is a *nerve* food allied to tea.

Numerous similar preparations are sold under fancy trade names, *e.g.*, BOVRIL, INVALID BOVRIL, BOVRIL BEEF JELLY, BOVRIL LOZENGES and TABLETS, OXO and BOVININE.—L. ii./05,420.

Yeast extracts have been made and substituted for meat extracts; a test has been published for detecting this substitution.— P.J. ii./03,516,704, *vide* also p.223.

Fersan.

Dose.—30 to 80 grains (2 to 5 Gm.) 3 times daily.

An iron, phosphorus and blood compound soluble in water, for anæmia.—B.M.J.E. ii./00,20; P.J.i./01,37.

Tablets 0·5 and 0·25 Gm.

Concentrated Beef-Tea.

A firm jelly, in ¼ and ½ lb. tins, also in skins, contains the natural gelatin of the meat, and, diluted, forms a nutritious substitute for true beef-tea.

Beef Bouillon in 2, 4 and 8 oz. tins and in glass jars.

Beef Tea Jelly is also made.

Meat Juice (Brand's).

A teaspoonful in a wine-glassful of water is a useful pick-me-up. Is prepared by cold process resulting in the retention of the full activity of the juice of the raw beef.

Essence of Beef. 2 and 4 oz. tins; also in bottles.

A soft, transparent, amber-coloured jelly, prepared from beef by exhausting with tepid water. It is agreeable to the palate and stomach of a delicate invalid; will often be relished when all other food is repelled, and is useful in allaying obstinate vomiting. It is best taken cold by teaspoonfuls, as desired, with or without a little bread and wine. Similar preparations are made from **mutton** and **chicken**.

Beef, Chicken, Mutton and Veal Peptones, are also prepared.

Restorative Essence of Beef.

Is made from fresh beef, freed from fat, finely chopped up—1 pound mixed with distilled water 8 ounces; add 5 drops of hydrochloric acid, and 60 grains or less of salt; stir well and allow to macerate for 3 hours; strain. The product has an agreeable taste, and should be taken cold. *Dose.*—A wineglassful or more (Ringer). It is also prepared *Peptonised*, by digestion with pepsin at the body temperature.

These are best freshly prepared for the patient.

Raw meat for tuberculosis.—B.M.J.E.ii./01,24.

Turtle Jelly and Soup are suitable for invalids.

Meat Lozenges.

In boxes; are savoury, gelatinous essence of beef lozenges, and contain substantial support for travellers in a portable form.

Beef Tea Tabules are made each containing sufficient for a breakfast cupful of beef tea—are convenient, particularly for travelling.

Peptonised Beef Jelly, *v.p.*531.

Peptonised Beef Suppositories, *v.p.*545.

Meat Juices, Liquor Carnis and others.

Dark, reddish-brown liquids consisting of the expressed juice of meat concentrated at a low temperature in vacuo. A teaspoonful is added to 3 tablespoonfuls of cold or tepid water, and taken in tablespoonful doses or more for sickness or exhaustion. Hot water coagulates the albumen.

Valentine's Meat Juice.

Dose.—½ to 2 drachms, diluted.

Two ounces are said to contain the condensed essence of 4 pounds of beef; keeps good in warm climates.

Wyeth's Meat Juice.

Dose.—½ to 1 drachm. It contains the albumins of meat in an active and soluble form and the hæmoglobin is unaltered (bright red colour). Should be mixed only with iced, cold, or luke-warm fluids.

Capsulæ Cruoris. Blood Capsules.

These contain 20 grains of the red corpuscular matter of fresh sheep's blood. They should be freshly prepared for the patient twice weekly, and are stated to be of great value in anæmia, debility and marasmus.

In this direction they should prove of greater utility than the customary dried blood preparations, as the blood is in an easily assimilable condition, and being coated with soluble white gelatin coating the capsules are not unsightly to the patient as are some of the liquid compounds.

Sanguis Bovinus Exsiccatus, Desiccated Blood. An American nutrient preparation.

Blood freed from fibrin, evaporated, at a low temperature, to dryness. Is in blackish-red, opaque scales, like tartarated iron in appearance, readily soluble in cold water. One part in 8 of tepid water may be used as an enema; the same strength, with the addition of a little glycerin and brandy, to keep the mixture, is recommended to be given in tablespoonful doses; or it may be given powdered, put into cachets.

Hæmoglobin. *Dose.*—1 to 2 drachms (4 to 8 Gm.).

The principal constituent of red blood corpuscles. It is supplied commercially in reddish black powder or of extract consistence or in scale form. May be given according to condition in cachet, capsule, or mixed with wine. Halliburton opines that hæmoglobin is useful in ordinary secondary anæmia. Its iron is absorbed in the extreme pyloric end of the stomach and in the first few inches of the duodenum. Hæmoglobin solution gives a characteristic absorption spectrum, and contains in organic combination iron equal to about ½%. *C.f.* also p.356, and for estimation in the blood p.833. It combines readily with with oxygen, forming oxyhæmoglobin.

Hæmoglobin Capsules.

Contain 5 grains (0·32 Gm.), and possess the advantage of not being unsightly to the patient.

Blood Preparations, a résumé, dividing same into 3 groups: (i.) colouring matter of blood unchanged or with slight traces of Methæmoglobin, *e.g.*, Pfeuffer's Hæmoglobin Extract and Hommel's Hæmatogen (which consists of defibrinated bullock's blood with Malaga Wine and glycerin). *Dose.*—2 to 4 drachms. (ii.) combinations of Methæmoglobin and Hæmatin, *e.g.* Hæmoglobin Lamellæ (Merck); (iii.) in which the normal absorption lines of the blood cannot be identified, *e.g.* Hæmol (Kobert) and Hæmogallol (Kobert), *q.v.*—P.J.ii./00,258.

Sicco. *Dose.*—15 grains (1·0 Gm.). A blood preparation in dry powder, soluble in water.

Nutrient Powder (Brand's).

On bread and butter or mixed with other food is very palatable—it retains the nutritive value of fresh meat.

Somatose. A light yellow granular powder, easily soluble in water, prepared from meat and consisting principally of albumose. It is odourless and nearly tasteless and may be given in any liquid, up to an ounce daily. In wasting diseases, *e.g.*, consumption, chlorosis, rickets, and in convalescence from disease.

Liquid-Somatose. A syrupy form of above, is more convenient for use.

Ferro-Somatose, Iron Somatose.

A tasteless brown powder soluble in water, containing about 4·5 % of ferric oxide combined with albumose. Useful in chlorosis and anæmia.—L. i./98,872.

Dose.—75 to 150 grains (5 to 10 Gm.) daily.

Lacto Somatose. Milk Somatose.

Dose.—1 to 2 drachms for children, 2 to 3 tablespoonsful for adults. Contains the albumose of milk desiccated.

Albumin Ovi Siccum, Ph. Ned.

Dose.—Ad. lib. The molecular weight of albumin has been given as approaching 14,000. Yellowish, transparent, horn-like pieces obtained by evaporating white of egg at not exceeding 50° C. (the fresh white of egg is used as antidote in case of poisoning by mecurial and copper salts). Should be easily soluble in about 10

parts of water, producing a neutral solution. Insoluble in alcohol and ether.

Incompatible with mineral acids, alcohol, mercuric chloride, tannin-containing preparations.

Constitution of the albuminous molecule.—Fischer, B.M.J. i./06,221.

Albumin Water, for infantile diarrhœa, white of one egg mixed with Sterile Water 8 ounces, Sodium Chloride 5 Gm., and a little whisky or brandy added.—Therap. Gaz., August, 1904.

Albumin Sanguinis.

Dose.—Ad lib. Is prepared by inspissating blood serum. Brown horn-like scales, not so soluble in water as the above.

Eucasein, Protene, Sanose and **Tropon** are also albuminoid food preparations.

Hémoplase. A French specialty,—a protoplasmic extract of blood corpuscles —F.N. 1906,123.

Milk Preparations.

Dried Milk, Sterile.

For infant feeding and general use. Supplied in three varieties :—

Dried Full-Cream Milk, with all its original cream.

Dried Half-Cream Milk with half its original cream.

Of either of the above, large packets = 3 quarts ; small packets = 3 pints, 10lb. tins = 32 quarts.

Dried Separated Milk containing 1% of its original butter fat. 1lb. packets = 4 quarts, ½lb. tin = 2 quarts, 10lb. tins = 40 quarts.

Lacvitum (not soluble in water), is the name given to a special Desiccated Milk. Is contains Milk Fat 29%, Proteid 28%, Milk Sugar 31%, Mineral Matter 6% (Calcium and Magnesium Phosphates, Sodium and Potassium Chlorides).

Lacumen is Lacvitum (above) freed from fat.

It is only soluble on the addition of alkali.

It contains Proteid 36%, Milk Sugar 50%, Mineral Matter 9%.

Milk, Artificial Human (Frankland).

Add to ⅔ pint new milk, the cream removed from another ⅓ pint after standing 12 hours. Curdle this ⅓ pint of skimmed milk with a 'square inch' of rennet by

contact for five to fifteen minutes. Break up the curd frequently, and separate the whey, which heat to boiling point, removing the casein which is thus separated. Dissolve 110 grains Milk Sugar in the hot whey, and mix it with the $\frac{2}{3}$ pint milk containing the cream of the other $\frac{1}{3}$ pint. The artificial milk should be used within 12 hours of its preparation, and the same piece of rennet will serve for weeks.—B.M.J. ii./93,822.

Simpler formula:—New Milk 30, Cream $1\frac{3}{4}$, Milk Sugar $1\frac{1}{8}$, Water 18; with instructions for sterilizing.—P.J. 1892,652. See also P.J., 1893,785,346.

Wippel Gadd on Humanised Milk.—P.J. i./05,59.

Artificial Human Milk is now sold in bottles, partially pancreatised and sterilised.

Normal Human Milk has the composition:—Fat 3·4%, Milk Sugar 6·4%, Albuminoids 1·7%, Mineral Matter 0·2%.

It is important to notice the difference between the human milk and cow's milk in the relationship between the albuminoids and the mineral matter.—*c.f.* figures, p. 855.

Ortho-Methyl-Amino-Phenyl-Sulphate, or **Ortol** (which is a mixture of this body with Quinol and is used in photography) are recommended for milk testing. One drop of a 1% solution is added to the specimen and followed by 1 drop of weak Peroxide of Hydrogen solution. Raw milk, or milk that has not been heated above 75° C. gives a reddish pink colour.—L. ii./03,24.

The **Pasteurisation of Milk**—So-called "sterilizing"—consists in raising it to the temperature of 70°C. (158° F.) and maintaining it at this temperature for 30 minutes. This effectually removes all pathogenic and the bulk of the non-pathogenic organisms. So treated, milk keeps sweet two or three days. The process may be carried out (*e.g.*, for infant feeding) by plugging convenient sized bottles filled with the quantity for one meal, heating in a pan surrounded with water to nearly boiling point, remove from the fire, cover with a clean cloth and allow to stand half-an-hour. Then cool rapidly, and store in a cool place.

To obviate the constipating effect of Pasteurising milk for infant feeding add 5 to 20 grains of sodium bicarbonate to the quart of milk, also a little milk sugar. The Sp. Gr. of the final product must be 1·033.—B.M.J. i./05,1182.

Milk contains more calcium than lime water. Milk

is, therefore, of value in hæmorrhage—where it is desirable to increase the calcium in the blood—also in many forms of pneumonia. Butter-milk useful in typhoid and in gastro-intestinal disorders of children.—B.M.J. i./06,124.

Dangers of Pasteurised milk.—L.i./06,1280,1349.

Sterilisers (for milk). The Soxhlet and Aymard's Patents are in use.

Milk Preservation.

Experiments show that Boric Acid 1 in 2,000 and Formaldehyde 1 in 50,000 preserve milk for 24 hours. Refrigeration and pasteurisation preserve without intervention of these chemical aids.—B.M.J. i./05,1412.

Filtration by means of sand has been suggested. This is largely done on the Continent. *Vide also pp.* 8, 104.

Budde Process of Preserving Milk

Consists in adding 15 Cc. of a 3% Solution of Hydrogen Peroxide to 1 litre of Milk and warming to 51–52°C for at least three hours. 48°C is not sufficient and 55° is too high.—L. ii./05,209.

The organisms found in milk may be classed as follows :—(i.) Acid-producing (100 varieties), the principal member of which is *B. acidi lactici;* (ii.) *B. acidi butyrici* (has very resistant spores, not killed by pasteurisation); (iii.) those responsible for fermentation to alcohol, as koumiss, butter-milk, red milk, blue milk, &c.; (iv.) the mould *Oidium albicans* produces thrush in infants' mouths; (v.) *B. tuberculosis* (20 to 30% of the cows in this country are tuberculous); (vi.) *Streptococci* associated with contagious mammitis; (vii.) *B. diphtheriæ;* (viii.) *B. coli communis* and *B. typhosus.*—L. & C.D. ii./05,576.

Koumiss (Artificial). *Syn.* Kefir.

Dissolve Grape Sugar ½ ounce in water 4 ounces, and add 20 grains of yeast and cow's milk 4 ounces. Place in a quart bottle and fill up with milk, cork and wire. Keep it cool, and shake it frequently during four days. Koumiss thus prepared contains some alcohol (1 to 2%) and lactic acid (about 1 to 5%). The original Koumiss of the Tartars was made from mare's milk by using the particular Kefir ferment, which swells up on soaking in milk. This consisted in reality of yeast cells with certain bacteria (*B. Caucasicus,* Kern.)

Uses.—As a stimulant in exhaustion and in convalescence of phthisis. Is recommended by Metchinikoff as a good nutritive and also as an intestinal antiseptic.

Is a specific in whooping cough. Is a diuretic, of use in chronic nephritis.—M.A. 1906,30.

Casein Preparations.

Casein is the principal albuminoid constituent of milk and is present in solution in the aqueous portion of the milk as an alkali-albuminate (the alkali in milk is about 0·5%). It is precipitated by dilute acids (*e.g.*, acetic acid, which is utilised in method of estimation, *v.p.* 856). Casein is, furthermore, thrown out of solution by the action of the rennet ferment. Casein is present in milk to the extent of 3 to 5% (usually about 3½%). Once thrown out of solution it is not readily dissolved again except in the presence of added alkali or hydrochloric acid.

Flocculent Casein, *see* Casumen, *p.* 361 (specially prepared) is, however, soluble in water.

The following preparations are believed to contain casein in some form or other.

Cheese is essentially casein with a little fat.

Casein (the name signifies the mother substance of cheese) and Caseinogen differentiated. — Halliburton, L.i./06,1347.

Casein Estimation; a method under consideration:—Mix 20 Cc. $\frac{N}{10}$ Ferric Alum Solution (48·1 Gm. per litre—U.S. 1890 Wts.) with 5, 10, 20, or 30 Cc. of the milk, add a little water. Shake, allow to stand, filter, and wash pp. free from iron. Titrate the filtrate or ½ of it with Potassium Iodide and Sulphuric Acid to give the amount of unused alum. A standard factor has yet to be arranged.—Am.Jl.Ph. Mar.1906.121. *Vide also p.* 856.

Virogen, a concentrated food prepared from fresh sterilised milk, rendered soluble and digestible by a special process. It contains combined phosphorus and iron in an assimilable form. Builds up muscular and nervous tissue.

It rapidly repairs tissue and nerve-waste; it is of value for restoring the fatigued, and is put forward as an addition to the ordinary diet, especially for the weak and debilitated and for melancholia.

Dose.—For adults two teaspoonsful made into a paste with a tablespoonful of cold milk or water. To this is added hot or cold milk, tea, coffee; soda water is very suitable. May be also given with food, *e.g.*, porridge, bread and butter. Children half the quantity.

Virogen Cocoa is also manufactured containing 20% Virogen.

Savore is a preparation of milk and cereal proteids and albumoses with carbohydrates.

Plasmon.

Is a soluble milk albumia (Casein) containing the original organic salts. It possesses nutritive properties, and is easily digested. Plasmon Biscuits, Arrowroot, Cocoa, and Chocolate are prepared.

Has been found of value in gastric diseases.

Protylin is a phosphorus and albumin compound. *Dose.*—4 grains (0·26 Gm.) four times a day for anæmia, neurasthenia and osteomalacia.—B.M.J.E.ii./04,52.

Casumen.

A soluble form of Casein (Flocculent Casein) containing a very high percentage of proteid (90%). For use in all cases where there is poor nutrition. It contains practically no fat or sugar.

Casumen is suitable for mixing with cocoa, chocolate, bread (10%) for diabetics, &c.; it is easily digested.

Pigmentum Casein, St. M.'s H. This ointment contains Casein 14, Potassium Carbonate ½, Glycerin 7, Vaseline 21, Zinc Oxide ½, Phenol ½, Water to 100.

Vegetable Albumin Foods.

Almo Food Products. These preparations are interesting as containing "Almo Extract," a yellowish crystalline powder constituting the vitellin or albumin of the ground nut or pea nut (*Arachis hypogæa*) *c.f. pp.* xxvii., 728.

The extract is soluble in strong solution of sodium chloride, but is precipitated on the addition of hydrochloric acid. Contains 16·66% nitrogen, with only 6·8% moisture, and 0·6% mineral matter. In the course of manufacture by patent process the bitter principle has been excluded. Is hence, very suitable for the preparation of diabetic bread, biscuits (absolutely free from starch and sugar), and shredded breakfast food after the style of "Force." The diabetic biscuits contain 80% proteid with butter fat, and will keep good in any climate.

As any addition to ordinary bread is also valuable, wholemeal bread can be produced containing 12% proteid and bread from ordinary flour can be strengthened to 20%. For general use in diabetes.—L. ii./05,1338.

At the time of going to press the "Almo" foods were not actually on the market, but were expected shortly.

Tritumen. A vegetable albumin made from wheat. Containing in addition 3% lecithin.

Quickly digested. Employed in rickets, during fever, rheumatism, gout, diabetes and kidney diseases. Iron Tritumen containing 0·4% iron is also made.

Gluten.—Method of estimation in cereals.—J.C.S.A., April, 1906, 324.

FUCUS VESICULOSUS (*Fucaceæ*).

Bladder Wrack.—*Syn.* SEA WRACK.

Preparations of this sea-weed, being rich in iodine, bromine, and chlorine salts, have long had the reputation of being useful in reducing corpulence.

Extractum Fuci Vesiculosi, B.P.C.

Prepared by exhausting with alcohol 45% and evaporating. This contains about 3% of Iodine. (Fucus vesiculosus, may contain as much as 0·21% of Iodine. The yield of extract is about 1 from 15.)

Dose.—3 to 10 grains (0·2 to 0·65 Gm.) before meals, conveniently given in 4-grain pills. with althæa.

Extractum Fuci Vesiculosi Liquidum, B.P.C.

Dose.—1 or 2 drachms (3·5 to 7 Cc.) before meals.

It is recorded, a lady lost 20 lb. in 9 weeks when taking the liquid extract; and a gentleman 8 lb. in 6 weeks; another 8 lb. in 3 weeks, without bad results.

FUNGI, Poisoning by.

A large proportion of deaths are due to *Amanita phalloides*, which peels like a common mushroom, but has bulbous part at base of stem, also yellowish green colour at edges and white gills; it grows beneath trees; the poison is a toxalbumin phallin, not an alkaloid.

Antidotes.—Stomach pump and emetics, castor oil, atropine and belladonna, brandy, spirit of chloroform, sal volatile, morphine for the pain, and administer normal saline. Potassium permanganate has been suggested to decompose any phallin left in the stomach.–B.M.J.ii./05,541.

GELATINUM (*Off.*).

Gelatina alba, P.G. iv. U.S.

Nearly colourless translucent sheets or shreds produced by action of boiling water on animal tissues, skin, tendons, ligaments, and bones.

Dose.—Ad libitum *per os*, and injected.

Tubes of Sterile Concentrated Saline Gelatin Solution are prepared for injection into the gluteal region as a hæmostatic; each makes a 2% solution on dilution with boiled water to five ounces—sufficient for one injection at 103°F.—C.D. ii./01,835. The name *Gelasepsin* (Squire) has been given to this solution.

Watson Cheyne expresses the opinion that the early cases of infection with tetanus were more probably due to the sutures becoming infected after sterilisation than to faulty injections.

Gelatin injections have been used to check bleeding from the lungs, from the intestines in typhoid and dysentery, from the bladder and from the stomach in ulcer and cancer of that organ. These injections may be followed by pain, fever, local swellings and nettle rash. Other hæmostatics may be combined with it.

A 1 or 2% solution of gelatin, or 20 grains with Cerebos salt in 5 ounces of water as an injection gave good results.—L. ii./00,772; B.M.J.E. i./01,55.

Aortic aneurism relieved by subcutaneous injection of solution 1 or 2%.—B.M.J. ii./00,1798; ii./01,740; Pr. lxx, 424; L. i./03, 1810; ii./03,86; i./05,1169.

A 10% solution injected was found of value in hæmophilia.

A case of purpura hæmorrhagica cured in three weeks by means of enemata of 6 to 10% solution.—M. 02,71. Also for hæmoptysis.—M.A. 1904, 580.

Two deaths from tetanus after gelatin injections for aneurism.—B.M.J. ii./01,638,741.

Checks hæmoptysis of phthisis. Injection of ½ pint of solution gave satisfactory results.—B.M.J. i./05,68.

For infantile diarrhœa, with food.—B.M.J.E. ii./03,59.

Glutoid Capsules.

These are prepared with gelatin coating which has been specially treated so as to render them indigestible in the stomach but digested by the pancreatic juice.

Many substances may be enclosed, *e.g.*, copaiba, eucalyptol, male fern extract, guaiacol, iodipin, creosote, menthol, methyl salicylate, pancreatin, etc.

Those containing iodoform (0·05 and 0·15 Gm.), and of salol, are utilised for diagnostic purposes—testing the power of the pancreatic juices, *c.f. p.* 427. Certain substances are not suitable for enclosure in glutoid, *e.g.*, potassium iodide, sodium salicylate, antipyrin.

Vernisol. — A water-soluble skin varnish, is a special preparation in form of a jelly which dries and leaves a transparent, flexible coating, non-irritating, and may be medicated with the usual dermatological agents.

GELSEMII RADIX (*Off.*) U.S.

Syn. GELSEMINUM.

Dose.—5 to 15 grains (0·32 to 1 Gm.).

The dried rhizome and roots of "yellow jasmine" —*Gelsemium nitidum* (*Loganiaceæ*) (*G. sempervirens*, Aiton) (*Loganiaceæ*) imported from the United States, must be distinguished from the yellow jasmine cultivated here, which is a species of *Jasminum*.

Uses.—Has febrifuge properties, as it lowers the pulse and depresses the nervous system, being antispasmodic and analgesic. It has been much used in acute and rheumatic neuralgia, toothache, uterine and ovarian pain and chorea. It is a powerful paralyser, as well as tetanizer, and respiratory poison. Large doses contract the pupil and cause giddiness and diplopia.

The plant contains two alkaloids designated **Gelseminine** and **Gelsemine**, the former being highly toxic, the latter of little importance. Much confusion has arisen between these two bodies.

Antidotes.—Emetics, Atropine or Strychnine hypodermically, repeated, and Nitroglycerin; or Amyl Nitrite; artificial respiration, stimulants.

A standard of 0·5% total alkaloids for the root, and 0·05% for the tincture has been suggested.

Gelseminina. $C_{22}H_{26}N_2O_3 = 363·54$ (366·288 I. Wts.). (Alkaloid—Merck.)

Dose.—$\frac{1}{100}$ to $\frac{1}{32}$ grain (0·00065 to 0·002 Gm.).

Yellowish-white minute crystals, with a bitterish taste, odourless, sparingly soluble in water, easily soluble in alcohol, ether, and dilute acids. This forms crystalline salts, and has mydriatic properties.

Gelsemininæ Hydrochloridum (Merck).

$C_{22}H_{26}N_2O_3 . HCl$ (?) = 399·73 (402·746 I. Wts.)

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain (0·0011 to 0·0032 Gm.)

In white, granular crystals, freely soluble in water.

Ophthalmic discs contain $\frac{1}{500}$ grain Gelseminine combined with gelatin.

Gelsemin. *Dose.*—½ to 2 grains (0·032 to 0·13 Gm.) in a pill, with spirit and glycerin.

The powdered alcoholic extractive (resinoid) of a pale brown colour.

Must be distinguished from the alkaloids.

Toxic symptoms following $\frac{1}{10}$ grain Gelseminine hydrochloride, given instead of Gelsemin.—B.M.J. i./89, 355.

Extractum Gelsemii Alcoholicum, B.P. 1885.

The powdered drug was percolated with rectified spirit, displaced with water, and the tincture evaporated to an extract. Was intended as equivalent of Gelsemin (above).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.).

Powdered Extract of Gelsemium of commerce contains 2·5% total alkaloids.

Fluidextractum Gelsemii, U.S. By percolation with Alcohol, strength 1 = 1.

Average dose.— 1 minim (0·05 Cc.).

Dysmenorrhœa is well treated by 3 minims of this fluid extract with 3 to 5 minims of Tincture of Belladonna thrice daily. Will often relieve pain in the most obstinate cases.

Tinctura Gelsemii (*Off.*).

Gelsemium in No. 40 powder 2, Alcohol (60%), *q.s.* to 20. Percolate. U.S., 1 in 10 Alcohol (94·9% vol.), and Water in proportion of 650 and 350.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.), often combined with bromide of ammonium or potassium for neuralgia. The tincture is fluorescent.

For neuralgia of face and jaws associated with carious teeth—15 minims of the tincture every 6 hours rarely fails to give relief.

Case of traumatic tetanus treated by Gelsemium with recovery.—B.M.J. ii./82,1245; B.M.J. i./83,9.

Disordered vision may follow even moderate doses.—B.M.J. i./01,640.

GLUCOSE.

Syn. Dextrose, Grape Sugar. $C_6H_{12}O_6$=178·74 (180·096 I. Wts.).

Glucose in white lumps or as a sticky mass, is prepared by acting on Starch with Dilute Hydrochloric Acid.

Glucose Tubes are prepared for artificial feeding as a preliminary to severe operations, for the resultant shock, and for wasting diseases. The use of this carbohydrate injection is, beyond doubt, of great value, and ought to be more widely known and practised. The glass tubes can be carried about for every serious operation. The contents of a tube are diluted to a pint with boiled water to make a 5 % solution (which strength is isatonic with the blood) and as much as a litre of this solution may be injected, and has never been found to cause any evidence of sugar in the urine. An ordinary aspirator needle about 1 mm. in transverse section of its lumen, attached to 3 feet of rubber tubing with a suitable glass reservoir above are all the apparatus required; this is carefully sterilised by boiling and is filled with the sterilised injection. The needle is introduced under the skin of the arm, near the axilla—the skin having been previously carefully cleansed—the douche is then raised 2 feet or so and the transfusion proceeds easily. The effect of the treatment has been uniformly good as regards pulse, general strength and relief of thirst.—A. E. Barker, B.M.J. i./02,770.

Glucose is said to be employed in the sophistication of honey, with the result that Oxymel Scillæ (*Off.*) varies in colour and density.—P.J.ii./03,778,871.

For method of estimation in Urine *see* p. 842 *et seq.*

Syrupus Glucosi, *v.p.* 560.

GLYCERINUM (*Off.*). U.S.

$C_3H_5(OH)_3 = 91{\cdot}37$ (*Off.* and U.S.Wts.) (92·064 I.Wts.).

Dose.—1 to 2 drachms (3·5 to 7 Cc.).

Manufactured by decomposing fats with alkali or superheated steam.—P.J.i./06,316. ***Soluble*** in alcohol and water in all proportions but immiscible with Ether or Chloroform.

For Official preparations, *see* Index.

Uses.—Internally tends to relax the bowels. Is added to cough mixtures and to relieve forms of indigestion with gaseous distention. As an enema it relieves constipation. Externally 1 with 2 or 3 of water prevents cracks of chilblains and forms an ingredient in a large

number of skin applications. Is a valuable preservative, *c.f.* "Aqueous" Tinctures.

As a throat pigment, and for uterine application, glycerin of tannic acid may be used double the official strength—1 to 2 of Glycerin—**Pigmentum Acidi Tannici.**

Glyceritum Acidi Tannici, U.S., is 1 in 5.

Glycerin of Borax is not a mere solution; it has an acid reaction, and when mixed with an alkaline carbonate evolves carbonic acid; it is useful in infantile diarrhœa, in doses of 20 minims, repeated according to age.

Glycerin of Starch. (*Off.*). **Glyceritum Amyli, U.S.** Glycerin 1, Water 1, Starch 8, is improved by addition of Tragacantha 1 to 400 parts.—P.J. i./97,201.

Glycerinum Aluminis is a useful astringent in chronic pharyngitis; is less disagreeable than tannin.

Half an ounce of Glycerin alone, or with one-third part of water added, forms a useful enema for constipation.

Two drachms injected into the rectum lessens the size of piles: also useful in infantile diarrhœa.

Intra-uterine injection of an ounce of 3% solution of formalin in glycerin recommended in cases of septic infection after childbirth.—L. ii./03,1229.

Glycerin Jelly, for toilet use.

Gelatin 140 grains, Rose Water 6 ounces; soak a few minutes, and heat in a water-bath to dissolve; add, when cool but still fluid, White of Egg ¾ ounce. Heat to coagulate completely, and add Glycerin 6 ounces, Salicylic Acid 12 grains. Mix well, filter through a hot-water funnel, and bottle while warm.

Lubricant Glycerin Jelly is supplied in 'Collapsubes.' Is somewhat softer than the above; is also suitable for toilet use; intended for the lubrication of Stomach Tubes.

Microscopic Glycerin Jelly is somewhat harder and is specially prepared for mounting purposes.

Glycerinum Aluminis et Acidi Tannici.

Potassium Alum (free from iron), in powder, 1, Glycerin 6. Heat to dissolve, and add Tannic Acid 1.

This forms a solution which is a very astringent throat pigment; has the advantages of a gargle without

destroying the appetite. An ounce to a pint of tepid water forms a useful astringent vaginal injection.

Glycerinum Bismuthi Nitratis.

Bismuth Nitrate, in crystals 1 (true nitrate), Glycerin 8. Dissolve without heat. A stimulant application in eczema.

Glycerinum cum Aqua Rosæ.

Glycerin 2, Rose Water, prepared with Otto of Rose, 3. Mix. An agreeable emollient for the skin.

Glycerinum Hydrargyri Perchloridi contains $\frac{2}{3}$ grain in 1 minim, *q.v.*

Glycerinum Plumbi Subacetatis (*Off.*).

This is about $\frac{3}{4}$ the strength as Goulard's Extract—**Liquor Plumbi Subacetatis Fortis**, with glycerin for the solvent in place of water; it keeps much better than and does not deposit like the latter. The Liquor (*Off.*) has Lead Acetate 5, Lead Oxide $3\frac{1}{2}$, Water to 20. **U.S.** has Lead Acetate 18, Lead Oxide 11, Water to 100. The *Off.* preparation can be made by shaking ingredients together occasionally for a week or so in the cold. **Liquor Plumbi Subacetatis Dilutus** (*Off.*), is 1 in 80 and U.S. 1 in 25 respectively. B.P. has also Alcohol 90% 1 in 80.

Useful in chronic eczema. It should first be applied diluted 1 part with about 7 of glycerin, and the strength gradually increased; it desiccates the eruption without producing a hard crust. It may also be diluted with four parts of milk as a lotion for eczema.

In inflamed joints after injury to bruised surfaces, especially if suppuration threatens, lead lotion (warmed) is useful.—L. ii./05,853.

Lead lotion should be used with great caution for eye lotions if the cornea is damaged.

Lotio Plumbi cum Lacte is generally made with Liquor Plumbi Subacetatis, 1 or 2 drachms to the ounce of milk, with a little Eau de Cologne added. For nettle rash and any skin irritation.

Liquor (or Lotio) Plumbi Lactatis has 1 part of Solution of Lead Subacetate to 15 of Milk, but it is more frequently used about 1 to 9. (Mid. H. adds Salicylic Acid 1 grain to each ounce).

The glycerole has also been found useful, in some uterine affections, applied on absorbent wool, diluted as above.

Unguentum Glycerini Plumbi Subacetatis, Lead Subacetate Ointment (*Off.*).

Glycerin of Lead Subacetate, by weight, 1, Paraffin Ointment, white, 5. Mix.

Useful in chronic eczema, ulcerated legs, and in tinea tarsi.

Unguentum Zinci Compositum, R.O.H., Ointment of Zinc, Ointment of Glycerin of Lead Subacetate, of each equal parts. Rub well together.

Glyceritum Vitelli, U.S. 1890. Glyconin.

Rub Yolk of Egg, 45, with Glycerin (by weight) 55, until thoroughly mixed. Used for emulsifying oils and applied to burns, fissures, and cracked nipples.

Glycero-alcohol.

Dose.—5 to 60 minims (0·3 to 3·5 Cc.).

Glycerin 333, Distilled Water 146, Alcohol, 95% 580. In Paris is recommended as a solvent of alkaloids and active principles, as it keeps indefinitely and does not evaporate. It has Sp. Gr. about 1.

Glyco-gelatin, T.H.

Refined Gelatin 1 ounce, Glycerin (by weight) 2½ ounces, Solution of Carmine *q.s.*, Orange Flower Water 2½ ounces. Soak the gelatin in the water two hours, then heat in a water-bath till dissolved, add the glycerin, and stir well together. When nearly cold add the carmine solution; mix till uniformly coloured.

Gelatinum Glycerinatum, U.S. Soak Gelatin 1 for one hour in sufficient previously boiled and cooled water to cover it. Drain and add Glycerin 1, heat until dissolved, strain hot, and evaporate until the product weighs 2.

Glyco-gelatin affords a ready method of prescribing lozenges to meet the requirements of individual cases; one ounce of the mass will make twenty-four pastils; it is medicated by melting in a water-bath, and the medicament added; or this, if insoluble, is first rubbed with a little glycerin, and then mixed with the hot basis, and cooled by pouring into an oiled tray, and, when solidified, cut into the required number of pastils. Pastils are especially suited to cases of inflammation of the tongue or palate, and their gelatinous nature gives much

relief in dryness of the throat. The following list may be kept prepared :—

Pastillus Acidi Borici gr.2
,, Acidi Carbolici ... ... gr.$\frac{1}{2}$
,, Aconiti Tinct. ... ... m.i.
,, Ammonii Bromidi gr.1
,, Ammonii Chloridi, T.H. gr.2
,, { Apomorphinæ ... ... gr.$\frac{1}{32}$ } { Codeinæ ... ... gr.$\frac{1}{10}$ }
,, Bismuthi Carbonatis, T.H. ... ... gr. 3
,, { Bismuthi Carbonatis, T.H. ... ... gr.3 } { Morphinæ Acetatis ... ... gr.$\frac{1}{40}$ }
,, Cascara Sagrada ... ... gr.2$\frac{1}{2}$
,, Cocæ Extracti ... ... gr.2$\frac{1}{2}$
,, Cocainæ Hydrochloridi gr. $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{20}$ (T.H. has $\frac{1}{10}$.)
,, Cocainæ gr.$\frac{1}{15}$ et Morphinæ... ... gr.$\frac{1}{30}$
,, Codeinæ .. .. gr. $\frac{1}{8}$
,, Convallariæ Tincturæ ... ... m. 2
,, Eucainæ β. .. .. gr.$\frac{1}{10}$
,, Eucalypti Olei ... ... m. $\frac{1}{2}$
,, { Eucalypti Olei ... ... m. $\frac{1}{2}$ } { Cocainæ Hydrochloridi ... .. gr.$\frac{1}{20}$ }
,, Heroin ... ... gr.$\frac{1}{24}$
,, Iodoformi ... ... gr. 1
(more or less if prescribed, *v.p.* 430).
,, Menthol, T.H. (St. Th. H. gr. $\frac{1}{4}$) ... gr. $\frac{1}{6}$
,, { Menthol ... ... gr.$\frac{1}{20}$ } { Cocainæ Hydrochloridi ... ... gr.$\frac{1}{20}$ }
,, { Menthol ... ... gr.$\frac{1}{20}$ } { Codeinæ ... ... gr.$\frac{1}{10}$ }
,, { Menthol ... ... gr.$\frac{1}{20}$ } { Eucalypti Olei ... ... m. $\frac{1}{2}$ }
,, Morphinæ Acetatis ... ... gr.$\frac{1}{30}$
,, { Pini Pumilionis Olei ... ... m. $\frac{1}{2}$ } { Terpeni Hydratis .. .. gr. $\frac{1}{8}$ } { Heroin Hydrochloridi ... ... gr.$\frac{1}{48}$ }
,, Sodii Biboratis ... ... gr. 3
,, { Sulphuris Præcipitati . ... gr. 5 } { Potassii Tartratis Acidi ... ... gr. 1 }
,, Terebeni ... ... m. 2
,, Thymol ... ... gr.$\frac{1}{32}$
,, Tussis = Cocainæ gr. $\frac{1}{15}$ et Morphinæ gr. $\frac{1}{30}$.

The **Pastils** or **Jujubes** commonly sold of oval or round shape (the latter are frequently 'sugared') will be found in the index under Trochisci marked G. (*i.e.* of Gelatin).

Suppositoria Glycerini. Glycerin Suppositories (*Off.*). Soak Gelatin, ½ ounce, in Distilled Water, *q.s.* for a minute, and pour away the excess; then add Glycerin, by weight, 2½ ounces dissolve in a water-bath and evaporate to 1,560 grains. Pour into moulds of 15, 30, 60, or 120 grain-measures, or other capacities as required. Contain 70 % by weight of Glycerin. This basis may be used for gelatin **pessaries**.

To save the evaporation it is better to add the warmed glycerin 5 to gelatin 1, dissolve in water 2.—C.D. i./05,464.

To 'set' Suppositories.—Wipe out the mould with a little ethyl chloride on cotton wool. This will effectually harden them in a few minutes.

Suppositoria cum Glycerino. Arzn. Glycerin with Soap Suppositories.

Sodium Carbonate 15, Glycerin 470; heat to dissolve; add Stearic Acid 25. Continue heat with agitation until combined and frothing ceases. Pour into moulds. Wrap the suppositories in tinfoil and keep in bottles.

Suppositoria Glycerini, P.Austr.

Sodium Carbonate 5, Stearin 9, Glycerin 100, and weigh 2 and 3 grammes.

U.S. orders Glycerin 30, Monohydrated Sodium Carbonate 0·5, Stearic Acid 2, Water 5, in Gm. for 10.

Vaginal Suppositories, U.S., are globular or oviform in shape and weigh about 10 Gm. if made with Glycerinated Gelatin, and 4 Gm. if with Theobroma Oil.

Hollow Suppositories, composed of Oil of Theobroma. May be filled with 20, 45, or 90 grains of Glycerin; they are more prompt in action than either of the above.

Hollow Suppositories and Pessaries may also be filled with **Bismuth** and **Cocaine Ointment, Gall** and **Opium Ointment, Liquid Extract** of **Hamamelis, Hamamelis Ointment, Suprarenal Extract, Adrenalin Solution.**

Cataplasma Kaolini, U.S.—Kaolin 577, Boric Acid 45, Thymol 0·5, Methyl Salicylate 2, Peppermint

Oil 0·5, Glycerin 375 (all by weight). Heat the Kaolin one hour on a water bath, add boric acid, glycerin, and other components.

Cataplasma Salicylicum Compositum (**Martindale**) is a similar compound, useful to remove œdema, to relieve pain and swelling of local inflammations.

Antiphlogistine is similar and is said to be composed of Glycerin, Boric and Salicylic Acids, Ferrous Carbonate, Peppermint, Gaultheria, Eucalyptus and Iodine, combined with an earthy basis.

Thermofuge is said to be a mixture of Aluminium Silicate, Glycerin, Boric Acid, Menthol, Thymol, Eucalyptus Oil, and Ammonium Iodide. It is used as a substitute for poultices to reduce heat, redness and swelling.

GLYCYRRHIZA (*Off.*).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) or more.

The peeled root and subterranean stem of *Glycyrrhiza glabra* (*Leguminosæ*).

U.S. has *G. Glabra* (Spanish) and *G. Glandulifera* (Russian) (*Leguminosæ*).

37 samples yielded 24 to 38% of aqueous extractive.

Extractum Glycyrrhizæ (*Off.*).

Dose.—5 to 60 grains (0·32 to 4 Gm.).

Extractum Glycyrrhizæ Purum. U.S.

Exhaust Glycyrrhiza in No. 20 powder with diluted ammonia. Incorporate 5% glycerin with the evaporated percolate. Is completely soluble in water.

Extractum Glycyrrhizæ Liquidum (*Off.*).

By cold exhaustion 1 = 1, contains $\frac{1}{5}$ of its volume of 90% alcohol. *Dose.*—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

A preparation made with ammonia might be included in the next B.P.—C.D. i./06,110. Incompatible with acids.

Fluidextractum Glycyrrhizæ, U.S.

Average dose.—30 minims (2 Cc.).

Macerate Glycyrrhiza 100 with boiling water 40 for one hour, and percolate with boiling water until exhausted. Concentrate to 40 and add 45 of Alcohol, set aside three days. Filter and distil until 50 remain, add Glycerin 25, Ammonia Solution 5 and Alcohol 20. Make up volume with water to 100.

Extractum Glycyrrhizæ Spirituosum, I.C. Add. *Dose.*—½ to 1 drachm.

Extract of Liquorice 2, Alcohol (90%) 1, Water *q.s.* to 4. Keeps better than the official liquid extract.

Elixir Pectorale.—P.G. Extract of Liquorice 1, Fennel Water 3, Anisated Liquid Ammonia 1.

Liquor Ammonii Anisatus consists of Oil of Anise 1, Alcohol 25, Solution of Ammonia 5.

Many of the Foreign Pharmacopœias give similar formulæ.

Glycyrrhizinum Ammoniatum, U.S.

Dose.—½ to 5 grains (0·032 to 0·32 Gm.).

Glycyrrhizin, $C_{24}H_{36}O_9 = 464·76$ (468·288 I. Wts.), the principle of liquorice, is precipitated, from solution in water, by acids. It is contained in the root as an ammoniacal compound; it forms garnet coloured, shining scales when precipitated, purified, re-combined with ammonia, and dried on glass plates; these possess persistent sweet taste, which Glycyrrhizin as such does not possess. A grain will flavour 6 ounces of water.

The before-mentioned preparations of liquorice are useful for covering the taste of nauseous drugs given in a liquid form, such as ammonium chloride, magnesium sulphate, quinine sulphate, ipecacuanha, and aloes. In tincture of aloes, liquorice effectually disguises the bitter taste; it is also added, for the same purpose, to Mistura Sennæ Composita, Decoctum Aloes Compositum, Confectio Sennæ, and as a demulcent was used in Infusum Lini, B.P. 1885.

In addition to the official extracts, dried extracts are largely imported from Italy and Spain, known as Liquorice Juice or Spanish Liquorice, that bearing the stamp of Solazzi being most prized. There are also prepared in England, Liquorice Lozenges, known as Pontefract Cakes, and the same substance in sticks about the thickness of a quill known as Pipe Liquorice. They are demulcent and useful in allaying tickling coughs.

Examination of commercial Stick Liquorice,—nearly all alike.—P.J. i./06,494.

Trochisci Glycyrrhizæ, Brompton Hospital, and **City Road Chest Hospital,** commonly known as 'Brompton' Cough Lozenges, or 'Brompton Blacks.'

Liquorice Extract 3 grains, Anise Oil ½ minim in each, with Acacia basis.

Pulvis Glycyrrhizæ Compositus (*Off.*).

Syn. PULVIS LIQUIRITIÆ COMPOSITUS, P.G., PULVIS PECTORALIS (*Kurellæ*).

Senna and Liquorice of each 2 (1½ P.G. iv.), Fennel 1, Sublimed Sulphur 1, White Sugar 6 (5 P.G. iv). Mix.

Dose.—1 to 2 drachms (3·5 to 7 Gm.), mixed with water or milk, taken early in the morning, is a mild and agreeable laxative. For constipation and hepatic disease, it is pleasant to take, and effectual without catharsis. U.S. uses oil of fennel, which makes the preparation less granular.

L.G.B. (Ireland) standard for ash is 4·5% maximum. A limit of 5% might be allowed.—B. & C. D. i./05,227.

GOSSYPIUM (*Off.*), U.S.—*Syn.* Cotton Wool.

The hairs of the seeds of *Gossypium Barbadense* and of other species of gossypium freed from fatty matter.

This is absorbent and is much employed as a wound-dressing. It is prepared by alternately treating bleached cotton with diluted hydrochloric acid and solution of soda and well washing afterwards. Gossypium is soluble in an ammoniacal solution of copper oxide.

Kapok. The Fibre from *Bombax Ceiba*, the silk cotton tree; it is extremely light, and is suggested as substitute for cotton wool.

The following surgical forms of **Cotton Wool Dressings** are in use. *See also* under the individual antiseptics for medicated preparations.

Bandages.—

Black Cloth, 6 yards, 1½, 2, 2½, and 3 inches, are prepared for use as slings.
Buttercloth, 1, 1½, 2, 2½, 3, 4, and 6 inches (6 yards).
Calico, 1, 2, 2½, 3, 4, and 6 inches (6 yards).
"Cataract" (of special form are made for bandaging the eyes after operation for).
Crêpe, Geneva, 1½, 2, 2½, and 3 inches wide.
,, Velpeau, 2, 2½, and 3½ inches wide.
Crinoline, for silicating and Plaster of Paris, 1, 2, 3 and 4 inches wide.
Domette, 2, 2½, 3, 4, 5, and 6 inches wide.
Elastic Circular Stocking, 2½, 3, and 4 inches (any length).
Elastic, India Rubber Webbing, 1, 2, and 3 inches wide.
Flannel, 2½, 3, 4, and 5 inches wide.
Gauze, Plain, Absorbent, 4 inches wide.

Bandages—*continued.*

"Ideal" (a special elastic bandage), 2½ and 3 inches wide.

Muslin, Check, for Plaster of Paris, 2, 3, and 6 inches wide.

Open Wove, white absorbent, 1, 1½, 2, 2½, 3, 4, 5, and 6 inches wide.

Plaster of Paris, 2, 2½, and 3 inches wide. In air-tight containers.

Selvedge, white and grey, 2, 2½, 3, and 3½ inches wide.

Stockinette—See Elastic Circular Stocking above.

Triangular, Esmarch's.

Battist, Milne's. A substitute for oiled silk, gutta-percha tissue, and jaconet. Can be boiled, and is spirit and grease proof.

Billroth's Cambric.—This material consists of cotton fabric treated by a special process. It takes the place of Gutta Percha Tissue and Oiled Silk, being capable of sterilisation without injury.

Buttercloth.—As a dressing for applying ointments, liniments, &c. Width 36 inches.

Cellulose Wadding.—A cheap absorbent dressing. Is prepared from wood fibre. 1 lb. rolls are supplied.

Eye Pads are ready cut, round or oval, consisting of a layer of wool between two sheets of gauze.

Felt, thick, coated with adhesive solution, in sheets 28 inches by 18 inches, and with soap plaster for bed sores.

Gauze Tissue, see Gauze and Wool Tissue.

Gauze, White Absorbent, is supplied in 6 yard pieces. Tela Depurata P.G. is similar.

White Absorbent with cotton wool tissue, in 1 lb. rolls.

Gauze and Wool Tissue, plain and medicated with Boric Acid, Carbolic Acid, Chinosol, Cyllin, Eucalyptus, Iodoform, Mercuric Iodide, Mercuro-Zinc Cyanide, Thymol, Picric Acid, are supplied.

Gauzes, Moist in glass jars, contain 1 and 5 yards (36 inches wide), of Boric Acid 10%, Carbolic Acid 5%, Perchloride 1 to 1,000 and 1 to 2,000, Iodoform 5 and 10% Mercuro-Zinc Cyanide 3% (*vide* also Sterilised Dressings.

Gauze Protective, Blue, consists of coarse mesh gauze rendered waterproof and treated with Sal Alembroth as antiseptic.

Gauzes, Ribbon, as suggested by C. Stonham. These have a woven edge to prevent fraying and are particularly recommended for plugging cavities and wounds. The following are supplied in ¼ inch, ½ inch, 1 inch, 2 inch widths, in 12 yard lengths, in boxes and bottles:—

Alembroth, Aluminium Acetate (useful for foul wounds.—L. i./03,936), Boric Acid, Carbolic Acid, Chinosol, Creolin, Iodoform, Mercuro-Zinc Cyanide, Non-Medicated, Mercuric Perchloride,

Handkerchiefs, Aseptic (Silky Fibre), are supplied medicated with Eucalyptus and Pine Oil, and Non-Medicated—intended for phthisical sufferers, in convenient cloth and leather wallets.

Impermeable Piline.—⅓ the thickness of spongio piline of felt, and instead of the waterproof indiarubber backing of the latter, there is an antiseptic material, not affected by heat or strong spirit. Suitable for applying liniments in rheumatism, and where warmth is desired simultaneously.

Jute, in 1 lb. rolls for rough absorbent purposes.

Lamb's Wool. Antiseptic for tampons. As a treatment for prolapse of the uterus; applied every day by the patient. Does not absorb fluids and maintains size and gives support. May be impregnated with mercuric biniodide 1 in 10,000.

Lint (*vide also* Sterilised Dressings) is supplied in two forms—'Finest' and 'Super Surgeon's'—in 1 lb. packages and 8, 4, and 2 oz. boxes.

Boric, contains half its weight of boric acid, and is coloured pink.

Iodoform, 10%.

Non-Absorbent is useful for local applications.—M.P. ii./03,395.

Styptic consists of absorbent lint, treated with 15% Ferric Perchloride.

Muslin, Nainsook, width 36 inches. Somewhat softer than buttercloth, is useful for ointments.

Sanitary Towels, Hygienic, for menstruation. Are prepared of Sphagnum, the turf moss; are very absorptive, deodorant and antiputrescent, see page 670. Hartmann's are of **wood wool**, a suitable material. Southall's, Nos. 0, 1, 2, 3, 4 and extra large, blue wrapper, and the "Mene" are of cotton fabric. Maw's are in two brands, ordinary and superfine.

Sponges, Carbolised, in wide-mouthed metal-capped bottles. These are used in abdominal surgery, and are in three sizes:—

(1) About 2 to 3 inches in diameter.
(2) About the size of palm of hand.
(3) Large flat, about 8 inches in diameter.

Many surgeons still prefer these to cotton swabs.—L. i./03,349.

"Zimocca" Sponges are similar, supplied in bottles of 1 dozen and cartons of ½ dozen.

Circular Gauze and **Wool** pads, about 3 inches in diameter. Also sterilised (*vide* Sterilised Dressings).

Spongio Piline.—Thick felt with waterproof indiarubber backing for applying warm moist dressings.

Sterilised Dressings.

Sterilised Dressings are supplied in cartons. These dressings have been submitted to a temperature of 250° F. for 30 minutes at a pressure of 15 lbs. in a steam vacuum

autoclave. Each parcel of dressing is wrapped by a patent method. As a further precaution there is a parchment wrapper and an air-tight dust-proof carton. In this form are supplied :—

Gauze, plain, absorbent, 1, 2, and 6 yard cartons.
,, **Alembroth** and **Boric**, each 1 and 2 yards.
,, **Cyanide**, 1, 2, 6, and 12 yard cartons.
Lint, plain, absorbent, **Alembroth, Boric,** and **Cyanide**, each in 1 and 2 oz. cartons.
Wool, plain absorbent, 1, 2, and 8 oz. cartons.
,, **Alembroth, Boric,** and **Cyanide**, each in 1 and 2 oz. cartons.
Swabs, Cyanide. Gauze, 4 × 4 inches, 12 in carton.
In addition, **Iodoform Gauze** (2 yards) and **Carbolised Wool**, 50, 100, and 250 Gm. are wrapped with aseptic precautions in similar cartons, but are not heated.
A Complete Abdominal Set in tin with key, contains 12 swabs 6 × 8 with tapes, 12 swabs 6 × 6, 4 towels, 2 thick pads 6½ × 8½ inches (as dressing), 1 bandage 3½ × 6 yd., and 4 safety pins.
Combined cartons contain 1 ounce of plain absorbent wool, with ½ yard plain absorbent gauze sufficient for a minor dressing, and combined cartons containing Alembroth Gauze (6 yards) with wool and gauze tissue suitable for a major operation.
Dressings are also supplied in **sterile tins** with key to open the hermetically sealed package. In this form are bandages (various sizes), towels, wrappers, swabs.
Swabs, cartons contain : 12 small round pads suitable for eye-work ; 6 larger round pads (about 2 inches in diameter); 12 gauze, 6 inches square ; 12 wool and gauze tissue pads, 3 inches square; **tins** contain 10 gauze covered swabs, 4 inches square ; also **tins** containing 10 swabs 6 inches square (*vide* also Triangular Swabs).
Eye Operation Set containing 1 × 2 inch bandage, 4 eye pads, 4 folds of gauze, 1 ounce absorbent wool.

Sterilised Dental Dressings,

For **Dental Use** are prepared :—
Aseptic Dental Napkins to be used once and thrown away.
Cottonoid, an absorbent felted cotton in sheets 3½ inches by 12 inches.
Absorbent Dental Rolls. As a substitute for the napkin or rubber dam. These are useful for covering the mouths of the salivary ducts ; a section may be placed on either side of a tooth, or the entire roll may be bent round the entire outside of the arch or under the tongue. No. 1 size, diameter $\frac{5}{16}$ inch ; No. 2, $\frac{3}{8}$ inch ; No. 3, $\frac{1}{2}$ inch ; No. 4, $\frac{5}{8}$ inch ; in 1½ or 6 inch lengths.
Non-absorbent Dental Rolls.—To replace the rubber dam. Useful in crown and bridge work. May be used in connection with the saliva ejector.
Sterilised Absorbent Pledgets for wiping out cavities.

Sterilised Dental Dressings—*continued*,

Aseptic Absorbent Points are prepared for drying pulp canals,

Sterilised Bibulous Paper, in sheets, 3 inches by 10 inches.

Carbonised Cotton for filling pulp canals, and for treatment of exposed pulps.

Tela Depurata. *See* Gauze. Purified Mull, P.G., is 100 Cm. broad. Each square metre weighs at least 30 Gm. Each square Cm. contains at least 24 threads except when otherwise ordered.

Tenax, carded oakum, 1 lb. packages.

Triangular Swabs are prepared having a pocket at one angle in which the finger, a probe or other instrument can be introduced. This facilitates the packing of a cavity or large wound during the process of operation. The swabs are sterilised in a steam vacuum steriliser, and are supplied in tins soldered down, containing respectively 10 and 20 swabs. The exact number is important, as by counting the swabs left over after an operation the surgeon can be certain of not having left any in the wound.—Jackson Clarke, M.P.C., Aug. 12, 1903.

Tillman's Dressing is Cellulose Wadding for absorbent purposes.

Tow, Flax. ½-lb. rolls.

Wool, Absorbent, 1 lb. rolls; also in 1, 2, and 4 oz. boxes.
Prepared cotton (non-absorbent) in similar packets.
Both the above also in thin sheets measuring 20 by 14 inches.

Wool, Hartmann's Wood Wool Dressings, *v.p.* 565.

Gossypii Radicis Cortex.

The root bark from *Gossypium herbaceum* (*Malvaceæ*) and other species.

Uses.—The following preparations are given instead of Ergot to check uterine hæmorrhage in all its forms. May relieve dysmenorrhœa.

Extractum Gossypii Radicis Corticis.—A semi-alcoholic preparation.

Dose.—1 to 4 grains (0·065 to 0·26 Gm.) in pill.

Pilula Gossypii Composita.

Extract of Cotton Root, Extract of Hydrastis, Ergotin, of each 1 grain (or 1 gramme divided into 15 pills).

Dose.—One, 3 or 4 times a day.

Extractum Gossypii Radicis Corticis Liquidum, I.C. Add. (*v.p.* xxv).

Dose.—½ to 1 drachm. The bark exhausted with a mixture of Glycerin 1, Alcohol (90%) 3; 1=1.

Extractum Gossypii Seminis Pulverisatum.

Powdered Cotton Seed Extract. *Syn.*—Lactagol. *Dose.*—1 teaspoonful 4 or 5 times daily. Said to increase the flow of milk. and the nitrogenous constituents of same. Given in milk or cocoa (rubbed smooth in the cold), and the cup then filled up either hot or cold, stirring the while.—B.M.J.E.ii./04,48.

Tinctura Gossypii Radicis.

Dried Bark of Root of Cotton Plant 1, Alcohol 60% 4. *Dose.*—1 drachm (3·5 Cc.) 3 times a day.

GRINDELIA (*Off.* in I.C. Add.) U.S.

Gum Plant.

The dried herbs *Grindelia robusta* and *G. squarrosa* (*Compositæ*)—the latter is most commonly used. The involucre, and often the leaves, are coated with a gluinous oleo-resin.

Uses.—Very useful in reducing the frequency and violence of the spasmodic attacks which occur in asthma, whooping-cough, and bronchitis, and is given in heart disease to slow and regulate the pulse.

Medicinal action due to resins.—C.D. ii./05,468.

Extractum Grindeliæ (Alcoholic).

Dose.—2 to 3 grains (0·13 to 0·2 Gm.) in a pill with lycopodium, three times a day.—R.

Extractum Grindeliæ Liquidum, I.C. Add.

Exhaust herb with alcohol (90%), distil, add Sodium bicarbonate to residue and water *q.s.* with alcohol (90%) one-fourth to make 1=1.

Dose.—10 to 20 minims (0·6 to 1·8 Cc.) at the onset of a paroxysm of asthma, repeated every half-hour or hour, in sweetened water or milk, else the resin separates and sticks to the vessel. Useful for whooping-cough.

Fluidextractum Grindeliæ, U.S. 1 = 1, Hydro-alcoholic percolate. *Average dose.*—30 minims.

Mistura Grindeliæ, G.H.

Liquid Extract of Grindelia 30 minims, Liquid Extract of Liquorice 1 drachm, Spirit of Chloroform 5 minims, Mucilage Mixture (*v.p.*129) to 1 ounce.

Tinctura Grindeliæ.

Dose.—1 to 2 drachms (3·5 to 7 Cc.). 1 in 8 of 60% alcohol by maceration. A resinous tincture which requires a suspending agent.

GUAIACI RESINA (*Off.*) U.S.

The resin obtained from *Guaiacum officinale* or from *Guaiacum sanctum* (*Zygophyllaceæ*).

The heart wood of these trees is **Guaiaci Lignum** (*Off.*). It is contained 1 in 10 in Liquor Sarsæ Compositus Concentratus (*Off.*). *q.v.*

Dose.—5 to 15 grains (**0·32 to 1·0 Gm.**).

This resin is found of great value in chronic rheumatism and lumbago, and for chronic sore throats; added to purgatives is found useful in gouty persons, and for sluggish liver. Diminishes sugar in diabetics.

Soluble almost completely in ether, chloroform, absolute alcohol and in sal volatile.

Petroleum Benzine Solution, 1 in 5, should be colourless and not turned green by equal volume Cupric Acetate 1 in 1,000 —absence of Rosin U.S. *See also* Naylor, P.J., July 28th, 1906.

Chelsea Pensioner, *v.p.* 684.

Tablets Guaiacum Resin and Sulphur 3 grains (**0·2 Gm.** of each). Useful for gout and rheumatism.

Capsules of Guaiacum Resin contain 5 grains.

Mistura Guaiaci. (*Off.*).

Dose.—½ to 1 ounce (**15·0 to 30·0 Cc.**).

Guaiacum Resin 100, Sugar 100, Tragacanth 16, Cinnamon Water 4,000.

Tintura Guaiaci Ammoniata. (*Off.*)

Dose.—½ to 1 drachm.

Add Guaiacum Resin 2,000 to strong Ammonia Solution 750, and Alcohol 90%, 8,000 Allow to stand 48 hours, shaking frequently. Filter, dissolve in the filtrate Oil of Lemon 21, and Oil of Nutmeg 31, and make up to volume of 10,000 with alcohol 90%. U.S. has 1 in 5 of Sal Volatile.

Average dose.—30 minims (**1·8 Cc.**).

Tinctura Guaiaci, U.S. *Average dose.*—1 drachm. 1 in 5 alcohol.

Guaiacum combined with apiol to check painful menstruation may be given in malt extract, beginning a week beforehand, two or three times a day; also to relieve amenorrhœa.

Trochisci Guaiaci Resinæ. Three grains of Resin with fruit basis. T.H. has 2 grains.

GUARANA. U.S.

Dose.—10 to 60 grains (**0·65 to 4 Gm.**) in powder, or infused in a cup of boiling water.

The seeds of *Paullinia Cupana*, *P. sorbilis* (*Sapindaceæ*),

roasted and moistened with water, made into a hard paste rolled into cylinders, and dried. Imported from Brazil. The drug contains about 5 % of a crystalline alkaloid **Guaranine,** which is identical with caffeine, *q.v.*, together with tannin, gum, &c. Guarana has been particularly recommended for sick-headache. A nervine tonic.

Dose.—½ to 5 grains (0·032 to 0·32 Gm.), or more.

U.S. has standard 3·5 % alkaloids.

Assay.—The alkaloids are removed by shaking with chloroform and ammonia. The chloroform is distilled from a measured volume of the liquid representing an equivalent of the drug. The residue is dissolved in a mixture of sulphuric acid and water, which solution is then treated with ammonia and successive quantities of chloroform. The chloroformic solution is carefully evaporated and weighed.

Elixir Guaranæ, B.P.C.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Guarana, in No. 60 powder, 4 ounces, Light Magnesia ½ ounce, Oil of Cinnamon 6 minims, Syrup 2 ounces, Alcohol 60 %, *q.s.* to 1 pint. Macerate and percolate.

Fluidextractum Guaranæ, U.S.

Average dose.—½ drachm (1·8 Cc.), Standardised to 3·5 Gm. Alkaloids in 100 Cc. Prepared by percolation with Diluted Alcohol.

Tinctura Guaranæ.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Macerate Guarana 1, in Alcohol 60 %, *q.s.* to produce 4.

HÆMATOXYLI LIGNUM.

Logwood (*Off.*). U.S.

The unfermented heart-wood of *Hæmatoxylon campechianum* (*Leguminosæ*). Possessing a sweetish stringent taste. The fermented chips used by dyers are deep red in colour, have lost the sweet taste, and the hæmatoxylin is oxidised to **Hæmatein,** $C_{16}H_{12}O_6$ = 297·84 (300·096 I. Wts.).

Preparations of logwood, colour the fæces and urine red, and stain linen.

Incompatible with acids and lime water. Certain metallic salts (notably iron) produce blue colour; mercuric salts, brown.

Decoctum Hæmatoxyli (*Off.*).

Dose.—½ to 2 ounces (15 to 60 Cc.).

Logwood in chips 50, Cinnamon Bark 8, Water 1,200. Boil

10 minutes. Final product 1,000. A valuable remedy for diarrhœa and some forms of urinary hæmorrhage.

Extractum Hæmatoxyli Liquidum, B.P.C.

Boil unfermented Logwood in No. 16 powder 20 ounces with Water 6 pints in three successive portions for half-an-hour each; mix the liquors, strain, and evaporate to 17 ounces; add Alcohol 3 ounces. Set aside for 7 days and decant from any sediment.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Extractum Hæmatoxyli, U.S. An aqueous extractive completely soluble in water.

Average dose.—15 grains.

Hæmatoxylin. $C_{16}H_{14}O_6+3H_2O=353{\cdot}48$ (356·16 I. Wts.). Usually met with in yellowish granular crystals, slowly and sparingly soluble in water, easily soluble in alcohol. Is much used for staining histological and pathological sections, *v.pp.* 840,841.

HAMAMELIDIS CORTEX ET FOLIA.

Witch Hazel Bark and Leaves (*Off.*).

Dose of bark, twigs and dried leaves, 30 grains (U.S.)

The bark and leaves, fresh and dried, of *Hamamelis virginiana* (*Hamamelidaceæ*), Witch Hazel, imported from the United States, possess powerful astringent properties.

Uses.—To check hæmorrhages and excessive mucous discharges, and for piles. They form the basis of the American Specialties—Pond's Extract (*dose*, 10 drops half-hourly), and Hazeline (*dose*, ½ to 3 drachms).

Liquor Hamamelidis (*Off.*). (B.P. gives no dose.)

Fresh Leaves 5, Water 10, Alcohol (90%) 1. Macerate 24 hours and distil one-half.

Dose.—½ to 3 drachms (1·8 to 10·5 Cc.), and used externally for piles, and by rectal injection for internal piles. Will also check epistaxis, bleeding from tooth sockets, and is applied to bruises.

Possesses an aromatic odour (*not* due to formaldehyde).

Aqua Hamamelidis, U.S.

Average Dose.—2 drachms.

Macerate Hamamelis Bark 100 in Water 200 for 24 hours; distil 85 and add 15 of Alcohol.

To test for Formalin, 1 Cc. added to 5 Cc., Sulphuric Acid containing a little Salicylic Acid in solution—no red colour should appear.—U.S.

About 75% of the preparations of Witch Hazel in U.S. have been proved to contain wood alcohol or formalin, or both. The U.S.P. employs dried bark; the fresh leaves are not officially employed there, yet the B.P. directs the fresh leaves. This appears anomalous. The U.S. article in aroma and taste does not compare very favourably with Liquor Hamamelidis, *Off.* (which cannot be made in this country).

According to the Sanitary Engineer (Dec. 14, 1881, p. 31 the distilled extract of hamamelis is chiefly prepared in the states of Massachusetts, Connecticut and New York. For this purpose the small twigs of the witch hazel are collected, preferably in the fall, when the leaves are off, and sold by the farmers to the distillers. Some of the stills employed hold more than a ton of these twigs, together with sufficient water to cover them. Steam heat is used, and from a ton of twigs 50 to 80 gallons of distillate is produced, to which 5 to 10% of alcohol is added to prevent change. The composition of the volatile substances thus separated has not yet been determined. There remains in the still a dark coloured, very astringent liquid, which is said to be available as a source of tannic acid.—P.J. i./1882,524.

Hazel Foam (Martindale). A soothing, non-greasy, ointment basis.

May be medicated with all forms of antiseptics and skin applications, *e.g.*, Ichthyol 3%; Ichthyol 3 to 10% with Resorcin 5%; Salicylic Acid 1%; Liquor Carbonis Detergens 10%; Cade Oil 5%.

Extractum Hamamelidis Liquidum (*Off.*).

Hamamelis Leaves, in No. 40 powder, are percolated with 45% alcohol. The first portion is set aside, and the other after concentration is mixed with it, so that 1 = 1 of leaves. *Dose.*—5 to 15 minims (0·3 to 0·9 Cc.).

Fluidextractum Hamamelidis Foliorum, U.S. *Average dose.*—30 minims (1·8 Cc.). A glycero-hydro-alcoholic percolate 1=1.

P. Austr. has 1=1 of leaves made with Alcohol 1, Water 2. Sp. Gr. 1·06—1·1.

Wool, Hamamelis, Absorbent, T.H. 1881.

Hamamelin.—*Syn.* **Hamamelidin.**

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) in pill. The powdered extractive from the above of a purplish-brown colour. A Suppository of 1 to 3 grains with cacao butter is useful for piles.

Compound Hamamelis Suppository.—Hamamelin 1 grain, Orthoform 5 grains, Cocaine Hydrochloride ½ grain, Opium Extract ⅛ grain, Belladonna

Extract $\frac{1}{6}$ grain, Cacao Butter to 60 grains. For internal hemorrhoids.—P.J.ii./04,580.

Hamamelin is of green colour when prepared from the leaves by alcoholic extraction, and is preferred by some.—P.J.ii./05,543. The brownish by others.—P.J.ii./05,573.

Tinctura Hamamelidis (*Off.*).

Bark, in No. 20 powder 1, Alcohol (45%) *q.s.* to 10.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

A valuable hæmostatic, very serviceable in hæmoptysis, hæmorrhoids menorrhagia, in fact in all passive hæmorrhage, and what is known as the hæmorrhagic diathesis. As an injection for bleeding piles, 1 drachm of the tincture in 3 ounces of cold water should be given as an enema, and retained, at bedtime or before breakfast, every day; or the following ointment applied locally.—R.

A lotion of 1 or 2 drachms with water to an ounce, is a useful application to bruises and small wounds.

Unguentum Hamamelidis (*Off.*).

Liquid Extract of Hamamelis 1, Hydrous Wool Fat 9; a better preparation is made with Soft Paraffin and Hydrous Wool Fat 2, or with a mixture of Hydrous Wool Fat 2 and Anhydrous 1. Used for piles.

'**Collapsubes**' of this are prepared with rectal tube for the treatment of piles, *vide* also **Hollow Suppositories** (*p.*371).

Also '**Collapsubes**' **of Hamamelis Ointment with Cocaine 2%**.

Witch Hazel Plasters are made in rubber combination for covering varicose veins.

HYDRARGYRUM (*Off.*).

Hg = 198·8 (200 I. Wts.).

Antidotes to Acute Poisoning by Mercurial Salts.—Emetics by mouth, Apomorphine hypodermically; white of 1 egg for every 4 grains of Perchloride (avoid excess), or milk; reduced iron; alcohol or ether for collapse; and opium for pain.

Uses.—Purgative, cholagogue and antisyphilitic.

Hydrargyrum cum Creta (*Off.*). *Syn.* **Grey Powder.** *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.).

Mercury 1, Prepared Chalk 2. Is said to become stronger on keeping by oxidation.

Injectio Hydrargyri Hypodermica. — *Syn.* **Grey Oil, Oleum Cinereum.** To be used with caution, *see* Mercurial Injections. Has caused cellulitis. Mercury 39, Mercurial Ointment 2, Vaseline Oil 59.

Dose.—1 to 2 grains daily for syphilis; B.M.J.E. ii./98,108. 500 injections have been administered at the Liverpool Skin Hospital with success.—B.M.J.ii./05,607.

Intramuscular Injection of Mercury.—Mercury ½ ounce, Anhydrous Lanolin 2 ounces, Liquid Paraffin (Carbolised 2%) to 5 ounces by volume. This contains 1 grain in 10 minims, and is a maximum dose once a week. Slowly absorbed and practically painless. 50,000 injections in syphilis without unfortunate results. Insoluble mercurials far better than soluble ones. Gluteal region best (Lambkin). — B.M.J. ii./05,1257,1348. This report contradicts previous results. *See also* Mercurial Injections *infra*.

Mercurial Injections (Summary).

These may be divided into two classes:—

(i.) Those containing the **soluble mercurial** salts, which on the whole may be considered the safer of the two, and

(ii.) Mercury and the **insoluble mercurials** suspended in oily liquids.

For further details of these solutions see body of text.

.—*Soluble Mercurials.*

(The solutions and suspensions are supplied in ½ oz. wide-outh stoppered bottles to admit of introduction of syringe.)

Sal Alembroth. *Dose.*—10 minims of 5% solution ery fifth to seventh day. Rather painful, slowly minated, fairly rapid in action.

Hydrargyri Cyanidum. Almost painless, but very isonous, may cause diarrhœa and albuminuria.

Hydrargyri Oxycyanidum has the same faults as latter.

Ragazzoni's Mercuric Iodide and Sodium dide Solution. Does not cause toxic symptoms. Its ramuscular use is painful.

Hydrargyri Lactas. A very soluble salt, safe l painless, rapidly eliminated and hence repeated dosage essary. *Dose.*—¼ grain in 15 minims.

Hydrargyri Oxidum cum Asparagin. To pare this solution the oxide must be freshly precipitated. simplifies matters to take the equivalent of mercuric

chloride (269·18 : 214·68 HgO) and decompose with excess o sodium hydroxide, washing carefully by decanting. Ou experiments show that 1 grain of mercuric oxide can be dis solved to form a permanent solution in 100 minims o saturated asparagin solution (1 in 50).

Hydrargyri Oxidum cum Formamido has no special advantages. *See p.* 405.

Hydrargyri Perchloridum. Employed both a intravenous and intramuscular injection. Causes great pain and may set up a local brawny induration. An injection o 10 minims containing $\frac{1}{3\frac{1}{2}}$ grain is used.

Hydrargyrum Sozoiodol. Safe, efficacious, and painless. *Dose.*—10 to 15 minims of a solution of the Sozoiodo Compound 2½ grains with Sodium Iodide 5 grains, in Water 100 minims, *i.e.*, ¼ to ⅓ grain. *See p.* 434.

Hydrargyri Succinimidum. Safe and comparatively non-irritating. *Dose.*—¼ to ⅓ grain in 10 to 15 minim water (2½ grains in 100 minims).

The soluble mercurials may be introduced into the system by kataphoresis, *q.v.*

2.—Insoluble Mercurials.

Hydrargyrum suspended as grey oil. The mercury i probably converted into albuminate in the system. May b irritant in action and comparatively slow. The strengt usually employed is 10 minims = 1 grain mercury, but *see als* Injectio Hydrargyri Hypodermica.

Hydragyri Oxidum Flavum in liquid paraffin ha no special advantage.

Hydragyri Salicylas Neutrale.

Dose.—$\frac{3}{10}$ to 1 grain.

Suspended 10% in liquid paraffin. Non-irritant and effective

Hydrargyri Benzoas, Tannas and Thymol acetas do not claim any special attention.

Hydrargyri Subchloridum. Causes pain. Exert a marvellously rapid remedial action on syphilitics. *Pa excellence* for endarteritis and its sequelæ.

Best given as 10 to 15 or even 20 minim doses containing respectively ½, ¾, or 1 grain of the salt suspended (10%) i sterile olive oil. The larger doses with caution. Employ morphine ¼ grain hypodermically to relieve pain.

Intravenous Injections of Mercurials are said to be painless, have small dose, are certain of absorption rapid of action, and do not salivate.

Difficulties of the method, consent of patient, possible thrombosis, pyæmic infarction, necessary daily injection Violent dysentero-diarrhœic symptoms or polyuria and even albuminuria may result.

The solutions of mercuric cyanide, oxycyanide, biniodide succinimide and perchloride have been used.

Lane injected 20 minims of 1% solution (*i.e.*, ⅓ grain), o mercuric cyanide daily or every other day—Campbel Williams, Clin. Jl., Jan. 10th, 1906 (vol. xxvi., No. 13, 196)

Mercury Amalgam.

This is one of the most popular of dental fillings.—"Black" Cosmos. Vol. xxxviii. page 991, suggests the following:—Silver 68·5, Tin 25·5, Zinc 1, Gold 5.

In use, the alloy is worked up in a glass mortar with an equal quantity of Mercury, and the excess of Mercury is squeezed out immediately before filling in. It is the general rule to employ a double filling, *i.e.*, to insert an initial filling of zinc oxy-sulphate or oxy-phosphate, *q.v.*, and afterwards an amalgam, whenever a metal filling is employed, and where the depth of the cavity will allow.

Hyrgol, Hydrargyrum Colloidale.—A specialty.

A water-soluble Mercury compound containing between 73 and 80% of Mercury. A 10% ointment recommended for inunction; it is of value for epididymitis.

Lanolinum Hydrargyri, *v.p.*81.

Linimentum Hydrargyri (*Off.*).

Strong Solution of Ammonia 10, Camphor Liniment *q.s.* to 45. Mercury Ointment 30, Camphor Liniment *q.s.* to 45 (fluid). Mix the two liquids.

Pilula Hydrargyri (*Off.*), **Blue Pill.**

Mercury 2 by weight, Confection of Roses 3, Liquorice Powder 1.

In affections of the peritoneum involving the lower quadrants of the abdomen or pelvis Mercury is without rival. In appendicitis Mercury inunction reduces the pain, mitigates thirst, and effects copious evacuation and urination, also suitable in all cases of infection of the peritoneal serous membrane.—M. Arch. Jan.05, No.1, p.2.

Mercuro-Lint Chest Bibs.

Made of felt impregnated with Mercury. No. 1 contains 10 Gm., No. 2 contains 25 Gm., No. 3 50 Gm. For introducing Mercury into the system.

Industrial Mercurial poisoning (preventive measures and treatment when set in). Potassium bromide and tincture of digitalis with solution of strychnine recommended.—L. ii./05,823.

Mercurial treatment should not be overdone. Skin eruptions often yield to "X" rays.—B.M.J. i./06,264.

Mercuric Ethylene-diamine Sulphate. *Syn.* SUBLAMINE. (*Very poisonous.*)

Contains 43% of Mercury. Soluble in 1·6 of water and about 1 in 200 of Alcohol, 90%. A

non-irritant sublimate substitute, is used in solutions of 1 to 1,000; *i.e.*, one tablet (*vide* below) to a quart of water. This strength is recommended for hand disinfection; the same or half this strength for vaginal irrigation, and for intramuscular injection in syphilis.

Tablets of Sublamine. Red in colour, 15 grains each.

Mercury is contained in mercurials in the following preparations in proportion as follows:—

Calomel 84·92%, Cyanide 79·32, Perchloride 73·80, Green Iodide 61·16, Red Iodide 44·05, and Benzoate 45·25.—Pr. lxx. 571. (Figures revised, 1906.)

Mercuriol. *Syn.* MERCURAMALGAM.

An amalgam of aluminium, magnesium and mercury the latter to the extent of 40%. It is an amorphous powder from which the mercury volatilises under influence of warmth, air and moisture. For syphilitic affections, carried as sachet.— B.M.J.i./00,579.

Mercurol, *v.p.* 224.

A combination of mercury with nuclein. Used for gonorrhœal injections, ½ to 2% solutions.—L. i./00,1450. Use in urethritis.—L. ii./00,871. Antiseptic use in the diseases of the nose and ear.—L. ii./00,1726.

Has been given internally in syphilis in 2 grain doses.

Unguentum Hydrargyri (*Off.*).

Mercury 16, Lard 16, Suet 1, Mix *s.a.* C.U.D. suggests should be 30%. Principally used for mercurial inunction in syphilis. To relieve local inflammation and to destroy pediculi on the skin.

Ph. Ned. 'UNGUENTUM NEAPOLITANUM' has Mercury 30, Wool Fat 5, Benzoated Lard 65, 'Fortius' is 50%

U.S. has Mercury 50, Oleate of Mercury 2, Suet 23, Benzoated Lard 25.

Unguentum Hydrargyri Dilutum, U.S. Mercurial Ointment (U.S.) 67, Petrolatum 33.

Unguentum Hydrargyri Compositum (*Off.*). Mercury Ointment 10, Yellow Beeswax 6, Olive Oil 6, Camphor Flowers 3. *Scott's Dressing, modified.*

Employed for enlarged glands, chronic synovitis and syphilitic nodes.

Unguentum Hydrargyri Mitius, B.P.C.; P.L. 1836, Blue Unction. Mercurial Ointment 1, Lard 2, Mix. Used for destroying *Pediculus pubis.*

Hydrargyrum Ammoniatum (*Off.*), U.S.
Mercuric Ammonium Chloride, $HgNH_2Cl$ = 249·93 (251·506 I. Wts.). **White Precipitate.** A white powder. Insoluble in water but soluble in hydrochloric acid. Used in parasitic skin diseases as :—

Unguentum Hydrargyri Ammoniati (*Off.*).
One in 10 of Paraffin Ointment.

Unguentum Hydrargyri Ammoniati Dilutum, N.H.W. Equal parts of the above with soft paraffin (white).

Unguentum Hydrargyri Ammoniati. U.S.
1 in White Petrolatum 5, and Hydrous Wool Fat 4.

Unguentum Prophylaxis. For prophylactic measures against syphilis. Metchinikoff suggests the use of Lanolin Ointments containing White Precipitate 25% Calomel 25%, and Mercuro-Salicyl Arsenate (*v.p.* 152) 25%. These are less irritating than 'grey ointment.' To be used by inunction for 4 or 5 minutes after coitus.

Gelatin Capsules of the ointment, with elongated points to be torn off, or 'Collapsubes,' are sterile, convenient, portable and cleanly.—L. i./06,1629.

Unguentum pro Eczema (Blackfriars H.), **N.H.W.** Ammoniated Mercury 10 grains, Lead Acetate 10 grains, Zinc Oxide 20 grains, Mercuric Nitrate Ointment 20 grains, Soft Paraffin ½ ounce, Lard ½ ounce.

Hydrargyri Benzoas. Mercuric Benzoate.
$Hg.(C_6H_5COO)_2.H_2O$ = 456·94 (460·096 I. Wts.).
Dose.—$\frac{1}{50}$ to $\frac{1}{10}$ grain (0·0013 to 0·0065 Gm.).
A white crystalline powder, practically insoluble in cold water (not even with sodium chloride added, as recommended by some), soluble about 1 in 180 of Alcohol 90%. In pill for syphilis. Injected, large doses necessary and Cocaine may be added.—B.M.J. ii./05,1255.
Intramuscular injections in uterine haemorrhage said surpass ergot.—B.M.J. ii./04,1085.

Hydrargyri Carbolas. Phenol Mercury.
$Hg(C_6H_5O)_2.H_2O$ = 401·36 (404·096 I. Wts.).
Dose.—½ to 2 grains (0·032 to 0·13 Gm.) daily.
A whitish amorphous powder, obtained by double decomposition of mercuric chloride and an alcoholic solution of phenol in caustic potash.
In syphilis doses of 4 increased to 11 milligrammes.—L. i./06,1269.

Hydrargyri Cyanidum, Cyanuretum Hydrargyri, P. Belg., $Hg.(CN)_2 = 250{\cdot}5$ (252·08 I.Wts.).
Dose.—$\frac{1}{20}$ to $\frac{1}{4}$ grain (0·0032 to 0·016 Gm.).

Is in anhydrous, white or colourless, prismatic crystals. ***Soluble*** 1 in 12 of water. It is not decomposed by alkalis; is poisonous, and has a nauseous metallic taste. It is used as a lotion to syphilitic sores, and given in pills of $\frac{1}{10}$ or $\frac{1}{12}$ grain twice daily. Used in diphtheria, $\frac{1}{250}$ grain frequently, with 1 minim Tincture of Aconite, in honey, employing also a gargle, 1 in 10,000.

Intravenous injections of 1% solutions of mercuric cyanide recommended in syphilis.—B.M.J ii./96,1702; L. i./99,432; **L. L.** has this strength.

In syphilis said to be dangerous.—Br. Jl. Derm., Aug., 1905.

Detachment of retina treated by 1 in 2,000 solution in (Saline), with 1% Acoine to relieve pain, also with Dionine 1 to 2% added.—B.M.J. i./06,262.

Various eye affections treated by intravenous injection of 0·01 Gm.—Oph., May, 1906,300.

Hydrargyri Oxicyanidum, $HgO.Hg(CN)_2 =$ 465·18 (468·08 I. Wts.) has been used as a subconjunctival injection.—B.M.J.E. ii./95,104.

In syphilis said to be of more use as it is richer in mercury and is less toxic, but has since been dropped by its advocator.—Barthelemy & Levy, "La Syphilis," Feb., 1905.

Mercuro-Zinc Cyanide, Lister's Antiseptic. A white powder obtained by precipitation from a cold saturated solution of the cyanide of mercury and potassium by adding a cold saturated solution of zinc sulphate in equi-molecular proportions, or by adding in similar solutions mercuric chloride to zinc and potassium cyanide. In this powder the two cyanides are combined in somewhat varying proportion; it should contain at least 20% Mercury Cyanide, $Hg(CN)_2$. If carefully made can be produced containing nearly 30%. Dunstan's original formula, $Zn(CN)_2, \frac{1}{4}\ Hg(CN)_2$ or $Zn_4Hg(CN)_{10} =$ 716·94 (722 I. Wts.) contains 35%.—P.J. ii./05,136.

Is tinted with rosaniline, and used to impregnate gauze.

Mercuro-Zinc Cyanide Gauze, 3%, is the most popular dressing for applying direct to wounds. It is supplied in 6 and 12 yard pieces, and **with cotton wool tissue** in 1 lb. packets. Is damped before use with 1 in 20 Carbolic Acid solution.

Mercuro-Zinc Cyanide Gauze Bandages, 2, 2½, 3, 3½ and 4 inches (6 yard).

Wool, Mercuro Zinc Cyanide, 3% strength, 1 lb., ½ and ¼ lb. rolls.

Cream of Mercuro-Zinc Cyanide may be made by triturating the powder with carbolic lotion, 1 in 20, *q.s.*, for applying to hairy parts adjacent to wounds.

Mercuro-Zinc Cyanide Paste. Mercuro-Zinc Cyanide 400, Tragacanth 2, Phenol 20, Water 800. Mix, for a first field-dressing for wounds in war.—Cheatle.

Collapsible tubes of the **Cyanide Paste** soldered at both ends and flat in shape are supplied for soldiers' use. The ends are easily torn off.

To insure a thin surface which will immediately dry, the paste must be rubbed on in as thin a layer as possible.

Lotion of Mercuro-Zinc Cyanide, of strength 1 in 5,000 to 1 in 1,000, is used for wounds.

Gargle of Mercuro-Zinc Cyanide, 1 in 7,000, is employed for syphilitic sore throat.

Unguentum Hydrargyri et Zinci Cyanidi, B.O.H. 1 or 2 in 100 of Soft Paraffin (SILCOCK'S OINTMENT) or Lanolin. For syphilitic sores and eczema.

'Collapsubes' these strengths and ¼ and ½% are prepared.

St. M.'s. H. has 1% in Unguentum Paraffini.

Hydrargyri Gallas. Mercurous Gallate.

$Hg[C_6H_2(OH)_3CO_2]_2$=534·34. (538·08 I. Wts.)

Dose.—½ to 1 grain (**0·032 to 0·065 Gm.**) in pill. A dark green insoluble amorphous powder, useful in syphilis, as its absorption is rapid without purging.

Hydrargyri Iodidum Rubrum (*Off.*).

$Hg\ I_2$=450·6 (453·94 I. Wts.).

Dose.—$\frac{1}{32}$ to $\frac{1}{16}$ grain (**0·002 to 0·004 Gm.**).

Pills contain $\frac{1}{50}$, $\frac{1}{36}$, $\frac{1}{24}$, $\frac{1}{16}$, $\frac{1}{12}$, and $\frac{1}{8}$ grain.

Tablets contain $\frac{1}{20}$ grain (**0·0032 Gm.**).

Red crystals ***soluble*** in solutions of other iodides, notably potassium iodide, and in solution of mercuric chloride, forming double salts; also 1 in 25 of castor oil or 100 parts of the latter will dissolve 8 of this

iodide with 5 of perchloride of mercury, about 1 in 200 ether, in alcohol 1 in 300.

Uses.—Is a powerful antiseptic.

Antiseptic Lotion for the hands ...	1 in 4,000
Collyrium	1 „ 5,000
Wound Lotion	1 „ 7,000
Vaginal Douche	1 „ 10,000

'Biniodide' Spirit Lotion 1 in 1,000 is employed.

In solution with sodium chloride is valuable for gonorrhœa, and as a pigment or spray for throat in scarlatina and diphtheria.—B.M.J. ii./91,834.

Injectio Hydrargyri Biniodidi (pro vagina), L.L.

Mercuric Chloride 8 grains, Potassium Iodide 5 grains, water to 1 ounce. Diluted 1 drachm to a pint of water ("1 in 10,000.")

Catgut is sterilised by 1 in 1,000 chloroformic solution.—L. ii./04,1396.

Unguentum Hydrargyri Iodidi Rubri (*Off.*).

1 in 25 Benzoated Lard.

May be applied to small spots of tinea, but not to large surfaces. Too strong for general use on the skin.

Exophthalmic goitre, many cases improved by daily use of this ointment half strength.—B.M.J. ii./05,1249.

An unstable **Yellow Mercuric Iodide** also exists which easily reverts to the red condition.

Injectio Hydrargyri Iodidi Rubri Hypodermica (Ragazzoni). *Dose.*—2 to 6 minims. Mercuric Iodide 1 grain, Sodium Iodide *q.s.*, in 64 minims.

In syphilis seldom gives trouble, and can be used in large doses.—Brit. Jl. Derm., Aug. 1905; but is painful.

Sterules, Hypodermic contain $\frac{1}{12}$ grain in 8 minims for a dose.

Injectio Hydrargyri Iodidi (Danlos).

Dose.—15 minims (0·9 Cc.).

Mercuric Iodide 0·01 Gm., Sodium Iodide 0·01 Gm., Subcutine (Anæsthesine Para-phenol Sulphonate) 0·05 Gm., Sodium Chloride 0·02 Gm., Sterile Ozonised Water 1·00. This solution is painless (comparatively). Injections are made into the muscles. Crystals may form in the ampoules supplied, which will re-dissolve on warming.—L.ii./05,1582. (There is an error in the quantity of water given in the "Lancet.")

Hydriodol, Mercuric Iodide Oil.—*Syn.* Cypridol.

Dose.—3 to 6 minims.

Contains 1% of the Iodide in sterilised oil, for hypodermic injection by syringe with screw piston.

For syphilis this has no advantage over aqueous solutions and all their disadvantages.—B.M.J.ii /05,1255.

Detachment of the retina has been treated by 0·4% solution in sterile oil. An injection daily into the lumbar region after cleansing the skin with ether. Suspension during 20 days after 10 of treatment.

Hydriodol Capsules contain of the Oil = $\frac{1}{32}$ and $\frac{1}{16}$ grain of Mercuric Iodide, and given *per os* are slowly absorbed by the biliary and pancreatic secretions, the Oil does not prove irritating to the digestive organs.

'**Collapsubes**' of Mercuric Iodide Ointment 1% with catheter attachment, are useful for the treatment of gonorrhœa.

Pilula Arsenii et Hydrargyri Iodidi.

Dose.—1 or 2, two or three times a day.

Arsenious Iodide, Mercuric Iodide, of each 1 grain, Distilled Water *q.s.* to dissolve, Sugar *q.s.* to make 12 two-grain pills (or 1 Gm. of each Iodide in 180 pills). May be combined with 2 grains of Iodide of Iron pill.

Wool, Mercuric Iodide. $\frac{1}{4}$% 1 lb. rolls.

Hydrargyri et Potassii Iodidum.

$HgI_2.2KI$ = 780·06 (786·18 I. Wts.).

Dose.—$\frac{1}{16}$ to $\frac{1}{4}$ grain (0·004 to 0·016 Gm.), in pill.

In yellow crystalline prisms; has been administered for syphilis. Is formed in solution when the perchloride is given in excess of solution of potassium iodide. The crystals are decomposed by water, depositing half the mercuric iodide.

In lupus erythematosus, 1 in 1,000 solution on gauze covered with protective (at night) acts like a charm. May have to be continued for months.—B.M.J. i./06,120.

Mistura Hydrargyri Biniodidi, K.C.H.

Dose.—1 ounce (30 Cc.).

Solution of Mercuric Chloride 30 minims, Potassium Iodide 10 grains, Ammonium Carbonate 5 grains, Decoction of Cinchona to one ounce.

U.C.H. has Solution of Mercuric Chloride 60 minims, Potassium Iodide 4 grains, Water to one ounce.

St. M.'s. H. has solution of Mercuric Chloride 1

drachm, Potassium Iodide 5 grains, Glycerin 10 minims, Water to 1 ounce.

Mayer's Reagent.

Mercuric Chloride 13·546 grammes, Potassium Iodide 49·8 grammes, Distilled Water to 1 litre.

This reagent gives a precipitate with alkaloids.

Pilula Hydrargyri Iodidi Rubri ($\frac{1}{8}$ gr.) **et Potassii Iodidi** (4 gr.). *Dose.*—1 twice daily.

Soaps containing respectively 3, 1 and $\frac{1}{2}$% of Mercuric Iodide are prepared. Useful for eczema, acne, scabies, ringworm, and desquamation after fevers.

Unguentum Hydrargyri et Potassii Iodidi, U.C.H.

Mercuric Iodide 4 grains, Potassium Iodide 4 grains, water 1 drachm, lard 3 drachms, Hydrous Wool Fat to 1 ounce. B. S. H. has 5 grains each of the salts, Water *q.s.*, Lard 1 ounce.

'Solubes' Biniodide.

Contain Mercuric Potassium Iodide 8·75 grains (0·57 Gm.). One dissolved in 1 pint of water forms a solution of the strength of 1 in 1,000—suitable for wounds. For lotions and instruments this may be diluted with from 1 to 3 or more parts of water.

Hydrargyri Iodidum Flavum. Yellow Mercurous Iodide. $Hg_2 I_2 = 649·4$ (653·94 I. Wts.); Hg I. U.S. = 324·4 (U.S. Wts.). P. Austr.

Prepared by double decomposition between freshly made Mercurous Nitrate and Potassium Iodide. (Must not be confounded with the yellow variety of Mercuric Iodide.) *Dose.*—$\frac{1}{8}$ grain (0·008 Gm.).

Pills and Tablets contain $\frac{1}{8}$ grain. Is given for syphilis, but the following preparation is better known:—

Hydrargyri Iodidum Viride. (B.P. 1867). Green Iodide of Mercury, Mercurous Iodide.

Dose.—$\frac{1}{6}$ to 1 grain (0·01 to 0·065 Gm.). **Pills** contain $\frac{1}{6}$ and $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{2}$ grain, and **Tablets** contain $\frac{1}{8}$ grain. May be given with opium and pepper to prevent looseness of bowels. ***Incompatible*** with other iodides.

This salt should be kept from the light, be of a yellowish-green colour, and contain slight excess of mercury; otherwise, as the late W.M. showed, it is unstable and dangerous.—P.J. 1890,259; B.M.J. ii./90,642.

The mercury may be subdivided by shaking with 3 or 4

times its volume of chloroform. The iodine, finely powdered, is then added. When action complete wash the precipitate with boiling alcohol and dry in the dark.—C.D. i./o5,163.

Under treatment of syphilis, in diabetic patient, by the green iodide, amount of sugar fell from 4—6% to 1% without change of diet.—Pr. li.134.

Hydrargyri Lactas, Mercurous Lactate.

$Hg_2(CH_3.CH.OH.COO)_2$=574·34 (578·08 I. Wts.).

Dose.—Hypodermically ¼ grain (0·015 Gm.) in 15 minims (1 Cc.) of water per diem, *per os* ⅓ grain (0·013 Gm.) well diluted.

A white crystalline compound, containing over 50% of mercury, soluble about 1 in 7 of water, insoluble in alcohol 90%.

This salt is recommended as antisyphilitic on account of its safety, solubility, and non-irritability.

Hydrargyi Nitras, Mercurous Nitrate.

$Hg_2(NO_3)_2.2H_2O$=556·52 (560·112 I. Wts.).

In colourless monoclinic crystals, generally either damp (from adhering acid) and soluble in water, or yellow tinted (from basic salt), then not perfectly soluble in water. Used for syphilitic sores, 1 in 30 or more, as a lotion or ointment, and occasionally internally in same dose as mercuric chloride.

Liquor Hydrargyri Nitratis Acidus. (*Off.*).

Used as a caustic for syphilitic warts, and lupus.

Urethral injection 1 in 1,000, or more, in gonorrhœa and for syphilitic sore throat as gargle.

Unguentum Hydrargyi Nitratis. (*Off.*).

Syn. Citrine Ointment.

Mercury 1, Nitric Acid 4 (fluid), Lard 4, Olive Oil 7 (weight).

Dissolve the mercury in the nitric acid without the aid of heat, agitating gently from time to time. Melt the lard in the oil contained in an evaporating dish capable of holding six times the quantity; heat the mixture to a temperature of about 280° F. (137·7° C.), add by degrees very carefully the cold mercurial solution, stirring constantly until cold. The product should be of a pale lemon colour.

Some mercurous nitrate remains in the mercuric solution before this is added to the fats. There being also an excess of acid present, the chemical action is thus intensified, and by the time the process is completed, by constant and vigorous agitation, all further chemical action will cease, and the

ointment will keep of a good colour for months without generating more gases and thus becoming spongy. Its preparation by this, the official process, requires care, skill, and constant attention. Alternative process:—

Dissolve the Mercury in the Nitric Acid with the aid of a little heat; place the Lard and the Oil contained in a porcelain vessel capable of holding six times the quantity, in a water bath, and heat the mixture to about 190° F. (87·7° C.), add gradually the solution of Mercury also at about the same temperature; mix thoroughly, modifying the action by the water-bath. The mixture should froth up, and be stirred until cold. The ointment made by this process, however well stirred, is apt to become spongy.

Suggested improved wording for B.P. monograph:—"Sufficient heat should be used to ensure vigorous chemical action" in place of specified temperature.—C.D. i./06,110.

U.S. has Mercury 70, Nitric Acid 175, Lard 760.

Unguentum Hydrargyri Nitratis Dil. (*Off.*).

Mercuric Nitrate Ointment 1, Soft Paraffin (yellow) 4.

In tinea tarsi of great value, employed with a brush to the eyelids, also in chronic eczema and psoriasis.

Unguentum Acidi Carbolici Compositum.

Mercuric Nitrate Ointment 2, Sublimed Sulphur ½, Phenol 1, Olive Oil 1, Yellow 1, Wax 1.—V.H.C.

Unguentum Metallorum, G.H.

Diluted Mercuric Nitrate Ointment, Lead Acetate Ointment, Zinc Ointment, of each equal parts.

St. J. H. has Mercurous Chloride 10 grains, Zinc Oxide 20 grains, Lead Acetate 10 grains, Nitrate of Mercury Ointment 10 grains, Lard to 1 ounce.

Unguentum Hydrargyri Nitratis Perdilutum.

St. G. H. has Mercuric Nitrate Ointment 1, Simple (B.P.1885) Ointment 7.

Hydrargyri Perchloridum. Mercuric Chloride (*Off.*); **Hydrargyri Chloridum Corrosivum. U.S.;** Corrosive Sublimate. $HgCl_2 = 269{\cdot}18$ (270·9 I. Wts.) (268·86 U.S. Wts.).

In heavy colourless crystalline lumps, ***soluble*** 1 in 17·9 water at 60° F., 1 in 3·64 of Alcohol 90% at 60° F., 1 in Ether, B.P. (0·720) 4·35 at 58·5° F.—P.J. ii./03,881, and 2 in 3 of Glycerin, *vide infra.*

Dose.—$\frac{1}{32}$ to $\frac{1}{16}$ grain (0·002 to 0·004 Gm.), increased to ¼ grain.

The official preparations are Lotio Hydrargyri Flava (0·46 to 100, or 2 grains to 1 ounce solution of lime

and Liquor Hydrargyri Perchloridi [Mercuric Chloride 1, Distilled Water 875; *dose*, ½ to 1 dr.]*

Incompatibles.—It precipitates most alkaloids from solutions, and should therefore not be ordered with them; the alkalis and the salts of silver and lead are attacked also. Steel surgical instruments should not be dipped in this solution. It forms insoluble compounds with albuminous fluids (*v. infra*), also incompatible with bodies containing tannin, soap, iodine and potassium iodide.

Uses.—Given in small doses in syphilis and has an antiseptic intestinal action and is employed in some forms of diarrhœa of infancy.—(R.), B.M.J.E. ii./04,60; L. ii./04,1405.

For eye lotions 1 in 4,500 parts of water, and for lotions for the nose and mouth and for vaginal leucorrhœa the same strength is suitable. R.O.H. gives 1 grain in 8 ounces of water for eye lotion.

The researches of Koch and others having proved this corrosive poison to be the most powerful antiseptic, solutions of it are much used as surgical dressings. A solution 1 in 1,000 of water, or preferably an equivalent of the strong **Glycerin Solution** (Perchloride, 2; Glycerin by weight, 3, dissolved without heat; heat reduces the salt to calomel), a fluid drachm, containing about 40 grains of the sublimate, to 4½ pints, suggested for military use.—B.M.J. i./84,365,1018. As dressings, lint, absorbent wool, gauze, or **Wood Wool**, *q.v.*, may be impregnated with ½% of each, corrosive sublimate and glycerin. Wood wool enclosed in sublimate gauze,

* Formerly equal weights of mercuric chloride and ammonium chloride were contained in the official solution. The late W. Martindale showed that in this solution a double salt was formed, ammonio-mercuric chloride or *Sal Alembroth*, with an excess of chloride of ammonium present. The solution thus prepared with common water (containing carbonate of lime) in place of distilled, or if even diluted with common water lets fall a white precipitate, if diluted much scarcely a trace of mercury is left in solution.—P.J. 1870,544. **Van Swieten's Solution** (Codex) F.E. consists of one part of mercuric chloride in 900 of water and 100 of alcohol; the B.P. *Liquor* was intended to supplant this. Exposure to sunlight reduces a solution of sublimate. Acidulating with hydrochloric or tartaric acid is said to prevent the precipitation of insoluble albuminate of mercury, and thus to increase and render its antiseptic power continuous.—B.M.J. i./88,148; P.J.1889,841.

both charged with ¼% of sublimate, the best artificial sponges.—B.M.J. i./91,448.

Sublimate injection in the uterus produced abortion and death.—B.M.J. i./06,1063.

For gonorrhœa and gleet a lotion of 1 to 2 gr. in 8 ounces is recommended.

For ear discharges, syringing with 1 in 10,000 is antiseptic. The glycerin solution is recommended as a pigment in diphtheria.

In syphilis the perchloride was found slow in action and is painful. Mercuric Perchloride 32 grains. Ammonium Chloride 12 grains, Water to 1 ounce. 10 minims as injection every third day.—B.M.J. ii./05,1255.

Further results in syphilis.—B.M.J. i./06,62.

Corosuccin. A mixture of Mercuric Chloride 1 in 20,000 and Succinic Acid 2% is said to be a bactericide equal in strength to Corrosive Sublimate Solution 2% (?).

Gargarisma Hydrargyri Perchloridi, St. M.'s H. (1 in 1,800). Mercuric Chloride ¼ grain, Hydrochloric Acid 1 minim, Glycerin 30 minims, Water to 1 ounce.

Lotio Hydrargyri Acetica.

Mercuric Chloride 1, Acetic Acid 75, Glycerin 75, Alcohol (90 %) 250, Rose Water 500. To destroy pediculi and detach their ova.

Pigmentum contra Tineam.

Mercuric Chloride 1, Salicylic Acid 9, Phenol 10, Glycerin 80. Efficient in ringworm.

Pills are made containing $\frac{1}{40}$, $\frac{1}{32}$, $\frac{1}{20}$, $\frac{1}{16}$, and $\frac{1}{12}$ grain of Mercuric Chloride.

Ophthalmic discs contain $\frac{1}{100,000}$ grain **Mercuric Chloride** combined with gelatin.

Sublimate Disinfectant.—*Local Government Board.*—L. ii./92,682; B.M.J. ii./93,18.

Sublimate ½ ounce, Hydrochloric Acid 1 ounce, Soluble Aniline Blue 5 grains, Water 3 gallons.

Lotio Hydrargyri Perchloridi Acida, St. Th. H., has Sublimate 1 ounce, Hydrochloric Acid 25 ounces, water to 500 ounces for the disinfection of excreta. This is a *powerful caustic*, and is not a lotion in the ordinary sense of the word.

Lotio Parasiticidus, St. M.'s H.

Mercuric Chloride ¼ grain, Acetic Acid 2 drachms, Water to 1 ounce.

Perchloride 'Solubes' are made of three sizes, combined with sodium chloride, and coloured blue. They are convenient for surgical purposes, the *largest* containing 17½ grains, making 20 ounces, 1 in 500; the *next smaller* containing 8·75 grains, 20 ounces of lotion, 1 in 1,000. These should be further diluted with from one to three or more parts of warm water before use. The *smallest* (½ grain) produce a solution of 1 in 4,500 when dissolved in a tumbler of warm water, suitable for ophthalmic work.—L. ii./90,72; P.J. ii./90,83.

NOTE.—'Solube' signifies material for preparation of solutions for external or local use.

Strengths of Solutions for use.

Solutions 1 in 10,000 to 1 in 1,000 may be used for infected linen, the walls and floors of infected rooms, the hands of surgeons and gynæcologists, and as a lotion to superficial wounds. For continuous applications, 1 in 10,000 forms an active lotion, and 1 in 500, with the same quantity of permanganate of potassium, is an efficient disinfector of an equal bulk of liquid fæcal infected discharges, if in contact for two hours.

There is risk of poisonous effects from vaginal injections of 1 in 1,000; watch for the occurrence of diarrhœa.

Experiments have shown that 1 in 1,000 solution kills anthrax spores in 15 minutes. The bacilli themselves being killed by 1 in 15,000 in 1 minute. The growth of the bacilli in question is prevented by 1 in 500,000 strength. A solution coming in contact with albumin has its power considerably reduced owing to formation of an albuminate of mercury, but 5 of hydrochloric acid or tartaric acid added to 1 of corrosive sublimate effectually prevents this change.—Hale White.

Tablets, $\frac{1}{100}$, $\frac{1}{32}$ and $\frac{1}{10}$ grain are for internal administration. **Hypodermic**, $\frac{1}{60}$, $\frac{1}{50}$, $\frac{1}{30}$ gr.

Wool, Perchloride ('Sublimate') 2% 1 lb. rolls.

Poisoning by 2½ grains accidentally contained in a headache powder. Treated by Olive Oil, Magnesia and emetics (Apomorphine). Lived 21 days.—B.M.J. i./05,767.

Tinea destroyed by solution of 3 grains in an ounce of spirit of nitrous ether.—B.M.J. i./85,434.

Hypodermic injection of 1 in 1,000 solution successful in 3 cases of anthrax.—B.M.J. ii./90,16; L. ii./91,658.

Lupus, in initial stage, subcutaneous injection of 1% solution into affected tissue successful.—L. ii./95,965.

Leprosy, two cases, relieved by subcutaneous injection of $\frac{1}{5}$ grain per week.—L. ii./96,364.

Empyema, three tappings and two injections of ¼ gr. Perchloride in 2½ ounces of water with marked improvement.—B.M.J. i./03,78.

For nævi apply a 6% Solution of Perchloride in Collodion.—B.M.J.E. ii./03,96.

Bilharzia (endemic hæmaturia). — Associated with this disease is almost invariably the appearance of blood and pus in the urine. Mercuric chloride intravenously is given with good results, the solution consisting of 1 mgr. of Perchloride in 5 minims of normal saline solution.

Sal Alembroth.—*Syn.* **Ammonio - Mercuric Chloride.** $HgCl_2.2NH_4Cl,H_2O = 393\,32$ (395·96 I. Wts.).

May be made by mixing solutions of equivalent quantities and evaporating; 3 grains represent approximately 2 grains of sublimate. In flattened crystals. Possesses powerful antiseptic properties, but does not combine with albumin so quickly as the pure sublimate, and therefore is not so irritating to the tissues. ***Uses.***—In medicating dressings (which are dyed blue), also as an intramuscular injection for syphilis.

Soluble 2 in 1 of Water, 1 in 4 of Alcohol 90%, also soluble in Glycerin.

Hypodermic Injection of Sal Alembroth.

Sal Alembroth 5, Sterile Water 100. *Dose*—10 minims,

Bandages, Alembroth Gauze, 6 yds., 3, 4, 5 inches wide.

Gauze, Alembroth, containing 1% of Sal Alembroth, is in 6 yard pieces, tinted with aniline blue. It is also supplied with **cotton wool tissue** of 2% strength in 1 lb., ½ lb., and ¼ lb. packages.

Wool, Alembroth. Absorbent 2%, 1 lb. rolls.

Hydrargyri Salicylas, Hydrargyrum Salicylicum, P.G. iv.

$$C_6H_4\begin{cases} O-- \\ CO.O \end{cases}>Hg = 333{\cdot}81\ (336{\cdot}032\ \text{I. Wts.}).$$

Dose.—⅓ grain (0·02 Gm.).

A white powder containing about 59% of mercury, slightly ***soluble*** in water (about 1 in 400), scarcely soluble in alcohol 90%. ***Used*** as an antiseptic and antisyphilitic, and as a dusting powder or ointment for specific sores. Should not be given in large doses with potassium iodide.

This is the basic mercuric salicylate as distinguished

from the neutral or normal salt (*vide* below). Hydrogen sulphide distinguishes easily, the normal salt being precipitated at once, the other slowly. Two mercurous salts are also known.—Y.B.P. 1903,294.

In syphilis suspended in almond oil, 1 in 10, with cocaine added, not so good as metallic mercury.—B.M.J. ii./05,1256; and in liquid paraffin, 1 in 10.—B.M.J. i./04,609,816

As an injection for gonorrhœa 15 minims of a mucilage suspension 1—300, has been used.

Hydrargyri Salicylas, Neutrale.

$(C_6H_4.OH.COO)_2Hg$=470·82 (474·08).

Dose.—Hypodermically $\frac{3}{10}$ to 1 grain suspended 1 in 10 in Liquid Paraffin. Comparatively non-irritant.

Hydrargyri Subchloridum, Mercurous Chloride. *Syn.* Calomel (*Off.*), Mercurius Dulcis, Ph. Ned. Hg_2Cl_2=467·98 (470·90 I. Wts.) Hg Cl=233·68 U.S. Wts.

Hydrargyri Chloridum Mite. U.S. *Syn.* Precipité Blanc (distinguish from British White Precipitate, *p.* 389).

Dose.—$\frac{1}{2}$ to 5 grains (0·032 to 0·32 Gm.). U.S. *average laxative* 2 grains, *alterative* 1 grain.

Heavy white powder. ***Insoluble*** in water, ether or alcohol.

Incompatible with acids, alkalis (*see* Lotio Nigra below), with sodium and potassium chloride and with bromides, iodides, sulphur, cherry laurel water, and antipyrine.

Uses.—Alterative and purgative. Was always considered a cholagogue, but at the present time is thought to empty the gall bladder only and not to increase the actual amount of bile formed. Most useful purgative for congested liver and dyspepsia generally. To be given at bed-time, followed by morning saline draught. For torpid liver ½ grain doses hourly valuable. As dusting powder to ulcers and many skin diseases (but not to the cornea of the eye if Potassium Iodide is being given).

Calomel in very large doses (100 to 150 grains) were given on the first day of acute peritonitis, and if the stomach were rebellious free inunction of calomel was made use of instead.

At the present time it is customary to administer fairly large doses (½ to 1 grain) of Calomel immediately after a major surgical operation.

For neurasthenia and neuralgia, intestinal antisepsis is required. Begin with full doses of calomel.—B.M.J. i./06,492.

Applied dry relieves pruritus ani.—B.M.J. i./04,982. In enteric.—B.M.J. ii./04,1450. In optical neuritis weekly injections of ¾ gr. successful.—B.M.J.E. ii./04,72.

In syphilis, Calomel 10 grains, suspended in Liquid Paraffin containing 2% carbolic acid ½ ounce. 10 minims to be injected once a week. Calomel is quickly absorbed but intensely painful, best used only as heroic measure.—B.M.J. ii./05,1255. Instead of Liquid Paraffin, Sterile Olive Oil can be used. 10 to 20 minim doses of a 10% suspension are employed. Morphine ¼ grain should be given afterwards to relieve pain.

Prophylactic against syphilis. Use of Calomel 1 in Lanolin 3—Metchinikoff.—L.i./06,1629.

Enuresis, give ¼ grain daily to regulate bowels.—B.M.J. i./06,905.

Calomel Tablets, $\frac{1}{10}$, $\frac{1}{6}$, ½, 1, 2, 3, 4 and 5 grains.

Lotio Hydrargyri Nigra (*Off.*). BLACK WASH.

Mercurous Chloride 30 grains, Glycerin ½ ounce, Mucilage of Tragacanth, 1¼ ounces, Solution of Lime *q. s.* to 10 ounces (about 1 in 150).

Gargarisma Hydrargyri Composita.

Black Wash 1 ounce, Potassium Chlorate 10 grains, Water 1 ounce. For syphilitic throats.

Pilula Hydrargyri Subchloridi Composita.—*Syn.* PLUMMER'S PILL (*Off.*).

Dose.—4 to 8 grains (**0·26 to 0·52 Gm.**).

Mercurous Chloride 25, Sulphurated Antimony 25, Guaiacum Resin 50, Castor Oil (by weight) 10·3, Alcohol (90%) 3 or *q.s.*

Pulvis Basilicus.

Dose for a child of 2 years, 4 grains (**0·26 Gm.**); of 6 years or upwards, 8 grains (**0·52 Gm.**).

Mercurous Chloride 3, Scammony 3, Acid Potassium Tartrate 3, Jalap 1, Ginger 1, Antimonial Powder 1.

Unguentum Hydrargyri Subchloridi.—*Syn.* CALOMEL OINTMENT. (*Off.*).

Mercurous Chloride 1, Benzoated Lard 9. A skin application which may relieve itching.

Calomel Cream, L.L. Calomel 10 grains to Vaseline 1 ounce.

Injectio ex Fernandez, F.E. ("Collyrium," *i.e.*, Urethral Injection).

Mercurous Chloride 3 Gm., Oil of Turpentine 20 Gm., Gum Arabic 60 Gm., Potash Alum 6 Gm., Spirit of Ether (Hoffman's Anodyne) 6 Gm., Camphor 6 Gm., Water 895 Gm. *s.a.*

Calomelol. Calomel in colloidal form with egg albumin. Soluble in water. Produces a useful ointment though not desirable for internal use.—B.M.J. i./05,197.

Herb Calomel in Astbury's Pills is calomel.—L. ii./05,978.

Hydrargyri Succinimidum, Imido-succinate of Mercury.

$(C_2H_4 \begin{cases} CO \\ CO \end{cases} > N)_2 Hg = 393{\cdot}48$ (396·164 I. Wts.).

A white silky powder, freely soluble in water; does not precipitate albumin or fluids of pleuritic effusion or hydrocele. Recommended as a hypodermic injection in syphilis, in 2½% solution=slightly over 1% of mercury. Addition of cocaine nitrate diminishes pain. Is said to preclude the formation of abscesses; and does not prevent patients following their vocation.

Dose by injection, ¼ to ⅓ grain (0·016 to 0·02 Gm.).

Unguentum Rubrum (Blackfriars). N.H.W.

Vermillion 6 grains, Red Mercuric Oxide 6 grains, Creosote 2 minims, Lard to 1 ounce.

Hydrargyri Sulphas. Mercuric Sulphate. *Syn.* Hydrargyri Persulphas. $HgSO_4 = 294{\cdot}14$ (296·06 I. Wts.).—B.P. 1885.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

A white powder (made by dissolving Mercury in strong Sulphuric Acid); water decomposes it with formation of **Turpeth Mineral** (Hydrargyri Subsulphas or Mercuric Oxysulphate, $HgSO_4 2HgO = 723{\cdot}5$ (728·06 I. Wts.).

A prompt emetic which has been given to children in croup and diphtheria to expel false membrane.

Mercurous Sulphate, $Hg_2SO_4 = 492{\cdot}94$ (496·06 I. Wts.).

A whitish crystalline powder slightly soluble in water and in dilute nitric acid. Is used for construction of standard electrical cells.

Unguentum Hydrargyri Sulphatis Flavi (Turpeth Mineral Ointment, Bazin's Ointment).

Yellow Mercuric Sulphate 15 grains, Benzoated Lard 1 ounce. Used for ringworm.

Hydrargyri Tannas, Mercurous Tannate.

Dose.—1½ grain (0·1 Gm.) in a pill. Should it cause diarrhœa in weakly patients add ¾ grain of tannic acid to each, or $\frac{1}{12}$ grain of powdered opium.

In dark green, odourless and tasteless powder or scales, containing 50% of mercury. It is not soluble or materially affected by diluted hydrochloric acid, but is decomposed by alkalis. Chemical composition varies. Pills are made containing 1, 2, 3, and 4 grains.

Unguentum Hydrargyri Oxidi Flavi. (*Off.*).

Yellow Mercuric Oxide [Hg O = 214·68 (216·0 I.Wts.) made by precipitating Mercuric Chloride with Sodium Hydroxide Solution] in very fine powder 1, Soft Paraffin, yellow, 49. ***Used*** for inflamed eyelids. **Pagenstecher's Ointment** is 4%, *i.e.*, double this strength; ointments of 1·25, 2·5, 5, and 10% are also prepared.

Mercuric oxide (orange) for ophthalmic use may be made by precipitating a boiling dilute solution of mercuric chloride with a dilute solution of potassium carbonate: wash by decantation with distilled water until washings do not react with silver nitrate or phenolphthalein. Organic matter in soft paraffin employed for the ointment (causing reduction) to be removed by boiling with potassium permanganate solution. —P.J.ii./04,609. We have tried this precipitation. The oxide is certainly more red than orange. We prefer the B.P. method.

'Collapsubes' are the most satisfactory means of dispensing, and are supplied of all the above strengths.

U.C.H. has this ointment in strengths (No. 1) 1 to 7, (No. 2) 1 to 16, (No. 3) 1 to 60.

Eczema is well treated by this ointment 0·25%.

U.S. has Yellow Oxide 1, Water 1, Hydrous Wool Fat 4, Petrolatum 4.

Injections of 2 grains yellow oxide of mercury suspended in liquid paraffin useful in syphilis.—L.ii./89,757.

The moist precipitated oxide (prepared in the dark) may be incorporated with a base consisting of Anhydrous Wool Fat 10, Spermaceti Ointment (without benzoin) or White Paraffin to 100.—P.J.ii./05,359.

The following formula is also suggested:—

Red Mercuric Oxide 10, Castor Oil 10, Petrolatum 85. Cover with water to prevent access of air.—P.J. ii./05,553.

Injectio Hydrargyri Oxidi cum Asparagin.

Dose.—10 minims (0·6Cc).

Mercuric Oxide, freshly precipitated, 2½, dissolved in Asparagin Solution (saturated—1 in 50) 100.

This injection is said to have no special advantages for syphilis, yet chemically the preparation is interesting.

Injectio Hydrargyri Oxidi cum Formamido [the amide of Formic Acid, $H.CO.NH_2 = 44·73$ (45·064 I.Wts.)]. Supplied in 1, 2, and 10% solution (of the oxide).

Dose.—15 minims (1 Cc.) of the 1% solution = $\frac{1}{6}$ grain (0·01 Gm.). The 2 and 10% solutions are for dilution at time of use.

Unguentum Hydrargyri Oxidi Rubri.

Syn. RED PRECIPITATE OINTMENT. (*Off.*)

Red Mercuric Oxide, in very fine powder, 1, Paraffin Ointment 9. For use in chronic skin affections.

The Yellow and Red Oxides are chemically identical.

The red is crystalline, and the yellow amorphous by precipitation.

U.S. has Red Oxide 1, Water 1, Hydrous Wool Fat 4, Petrolatum 4.

Unguentum Rubrum cum Cantharide. V.H.C.

Red Mercuric Oxide 1 drachm, Vinegar of Cantharides 1 drachm, Soft Paraffin to 1 ounce.

Hydrargyri Naphthol-acetas, Mercuric-β-Naphthol Acetate, $Hg.C_{10}H_7O.CH_3.COO = 399·36$ (402·08 I. Wts.).

Dose.—$\frac{1}{2}$ to 1 grain (0·032 to 0·065 Gm.).

An amorphous odourless yellowish-white powder, melting to a green oily liquid, insoluble in the usual solvents, excepting dilute alkalis. Diluted with kieselguhr, or in gauze or salvemull, or triturated with fresh albumin and diluted with water, has been used to promote healing of wounds; it is also a mild antisyphilitic.

Hydrargyri Thymolacetas, Mercury Thymol Acetate $(CH_3COO)_2\,Hg\,(CH_3COO.C_{10}H_{13}O)Hg = 721·32$ (726·176 I. Wts.). A white powder practically insoluble in water.

Use.—In syphilis as an intra-muscular injection, 1 in 10 of liquid paraffin (suspension), also in pills, in doses of $\frac{3}{4}$ to 1½ grains (0·05 to 0·1 Gm.).—P.J. 1888,427; 1889,607,341.

Injections of insoluble mercurials sometimes followed by intestinal disturbances and dysenteric conditions, cough, cyanosis, and back pains.—B.M.J. ii./89,1062.

HYDRASTIS RHIZOMA (*Off.*).

Syn. GOLDEN SEAL.

Dose.—10 to 30 grains (0·65 to 2 Gm.).

The dried rhizome and rootlets of *Hydrastis canadensis* (*Ranunculaceæ*).

U.S. is standardised to 2·5% Hydrastine.

Assay Method.—The drug in No. 60 powder is treated with ether, ammonia and water. A volume of the filtrate is shaken out with sulphuric acid and water. The acid solution is rendered alkaline with ammonia and shaken out with ether, the ethereal solution is evaporated and the residue weighed. Rapid estimation method.—P.J. ii./05,580.

Uses.—Externally stimulates unhealthy ulcers, and as a lotion (1 in 20 liquid extract) checks profuse local sweating, and employed in acne and seborrhœa, and stops nose bleeding. In gonorrhœa, more particularly the late stages, Hydrastis both locally and internally is of value; as an injection 1% solution of the liquid extract (or combined with 1% of Protargol and 5% Glycerin) is recommended.—H. It possesses tonic stomachic properties, is used in intermittent fevers, and causes uterine contraction. It contains, in addition to Hydrastine, a quantity of Berberine, *q.v.*

Infusion of 1 drachm in 8 ounces boiling water useful in vaginal gonorrhœa and leucorrhœa.—H.

Extractum Hydrastis Liquidum. (*Off.*)

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Hydrastis in No. 60 powder, with 45% alcohol (60% better.—Dott, P.J., July 28, 1906), prepared as Extractum Hamamelidis Liquidum; 1=1 of rhizome.

Extractum Hydrastis fluidum, P. Austr., has 10% of glycerin.

Capsules are prepared each equivalent to 30 minims of the liquid extract.

Fluidextractum Hydrastis, U.S., 1=1. *Average dose.*—30 minims (1·8 Cc.) Glycero-hydro-alcoholic percolate standardised to 2% hydrastine. The P.G. preparation is of the same standard.

Ph. Ned. prepares 1=1. Tartaric Acid 0·25% is employed with alcohol to Extract. Standard 2% Hydrastine.

Powdered Extract of Hydrastis of commerce contains 10% Hydrastine.

In pruritus ani for the varicosity inject daily one or two ounces of the following, mixed :—Liquid Extracts of Hydrastis 2, Hamamelis 16, Ergot 2, Compound Tincture of Benzoin 2.—M.A./1906,410.

Mistura Hydrastis et Ergotæ.

Liquid Extracts of Hydrastis and Ergot of each 30 minims. Chloroform Water to 1 ounce for a dose.

This is one of the most powerful remedies for menorrhagia, and so also is a mixture of Hydrastis and Hamamelis.—W.W.W.

Extractum Hydrastis.—Prepared by evaporation of the liquid extract.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

That of *Codex Supp.* is prepared with 60% alcohol.

Glyceritum Hydrastis, U.S.

Average dose.—30 minims (1·8 Cc.).

Concentrated alcoholic percolate, from which resinous matter is precipitated, by adding to ice cold water, filtering and finally making up to strength 1=1 by addition of glycerin. Is miscible with water in all proportions, but is not standardised as is the fluidextract.

Hydrastina, Hydrastine, U.S.

$C_{21}H_{21}NO_6$=380·33 (383·208 I. Wts.; 380·32 U.S. Wts.)

Dose.—$\frac{1}{2}$ to 1 grain (0·032 to 0·065 Gm.).

Pills containing $\frac{3}{4}$ and 1 grain are made.

An alkaloid in white prismatic crystals, insoluble in water, but soluble in alcohol 90% 1 in 150, chloroform, and ether; taste very bitter.

To distinguish from Hydrastinine :—A crystal dissolved in dilute sulphuric acid, and 1 in 10 solution of potassium permanganate added, blue fluorescence develops. (U.S.)

Has been found to produce uterine action and induce abortion, without danger to the patient, injected hypodermically.—L. i./86,991.

Hydrastinæ Hydrochloridum, P. Belg.

$C_{21}H_{21}NO_6.HCl$=416·52 (419·666 I. Wts.) + Aq.

Dose.—$\frac{1}{2}$ to 1 grain (0·032 to 0·065 Gm.).

A crystalline soluble salt; is used like the alkaloidal base, and is said to act as an expectorant.

General research on the action of Hydrastine Hydrochloride.—B.M.J. ii./98,1052.

Hydrastinæ Tartras Acidus.

$C_{21}H_{21}NO_6.CHOH.COOH.CHOH.COOH.4H_2O$= 600·77 (605·32 I. Wts.).

Dose.—½ to 1 grain (0·032 to 0·065 Gm.).

In fine white needles, sparingly soluble in water.

Hydrastininæ Hydrochloricum, P.G. iv., U.S.

$C_{11}H_{11}NO_2.HCl$ (Schmidt and U.S.)=223·9 (225·586 I. Wts.; 223·88 U.S. Wts.).

Dose.—½ grain (0·032 Gm.). *Per os* or hypodermically in 10% solution.

A salt of **Hydrastinine**, $C_{11}H_{11}NO_2$ = 187·71 (189·128 I. Wts.) + Aq. An oxidation product of Hydrastine, is allied to Cotarnine, *q.v.*

In pale citron yellow crystals, ***soluble*** 1 in 1 of water (with blue fluorescence when considerably diluted).—M.P. 212° C. Has been used for internal hæmorrhage hypodermically. Useful in menorrhagia and dysmenorrhœa.

Hydrastinine is probably the active constituent of the drug. It acts immediately, while other preparations require some days' administration before any decisive effect is produced.

Purulent ophthalmia neonatorum well treated by 1% solution containing 0·1% Morphine Sulphate.

Hydrastinum, B.P.C.

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) in pill.

This is made by extracting with 60% alcohol, but should be made with stronger alcohol and standardised to contain 20% of total alkaloids, of which ⅖ should be Hydrastine.—P.J.ii./01,140. It is of yellow colour.

Uses.—Aperient, cholagogue, stomachic, and tonic; is also used as a dressing to ulcers, acting as an antiseptic.

3 to 6 grains in a pill, followed by Effervescing Sodium Sulphate, is a useful biliary stimulant.

Tinctura Hydrastis (*Off.*).

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

Hydrastis, in No. 60 powder, 1 in 10 of Alcohol (60%). U.S. 1 in 5 of a mixture of Alcohol 94·9% by volume and water in proportion of 650 and 350. Standardised to contain not less than 0·4% Hydrastine.

In gastric catarrh from chronic alcoholism is about the best substitute for the stimulant when this is abandoned. Useful in atonic dyspepsia, habitual constipation due to inaction of the liver, and in general debility it is very efficacious, its action being not unlike that of quinine.

It is also employed as an injection for gonorrhœa, 2 drachms to a pint of water used very frequently at first. As a lotion it is employed in chronic inflammation of the mucous membranes, also for cracks and fissures of the nipple.

It is useful in fibroid tumours; does not cause painful contractions, and the application of hydrastis is often successful in chronic pharyngitis.

Successful use in goitre.—B.M.J.E. i./02,67.

Given for hæmoptysis in phthisis entirely prevented night sweats.—Ed.M.J., 1891,473.

Liquor Sedans. *Dose.*—½ to 1 drachm (2 to 4 Cc.).

A specialty said to contain in 1 ounce Hydrastis (represented by white alkaloid Hydrastine) 60 grains; Black Haw (*Viburnum Prunifolium*) 60 grains; Jamaica Dogwood 30 grains; with aromatics. To restrain nervous irritability and as ovarian and uterine anodyne.

Berberinæ Carbonas $C_{20}H_{17}NO_4\ H_2CO_3 + 2H_2O$ (Schmidt) = 429·97 (433·224 I. Wts.).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Although contained in Hydrastis and Calumba, is obtained principally from the bark of *Berberis vulgaris* and other species of Barberry. It is in bitter, yellowish-brown, acicular crystals, insoluble in water. It forms with chloroform, ether, and alcohol, crystalline compounds. Its salts, the **Hydrochloride, Phosphate, and Sulphate,** are bright yellow in colour, and soluble in water, the hydrochloride about 1 in 400, the phosphate 1 in 12, and the sulphate 1 in 150. *Dose* of each.—½ to 6 grains (0·13 to 0·4 Gm.). Given for indigestion, diarrhœa, malaria, and sickness in pregnancy.

Occurrence of in plants.—Y.B.P. 1902,40.

Berberis Aquifolium is official in U.S.

Fluidextractum Berberidis. U.S. *average dose.* 2 Cc. (30 minims). By hydro-alcoholic percolation.

Composition of Berberine Phosphate.—Y.B.P., 1900,507.

HYDROGENII PEROXIDI LIQUOR. (*Off.*).

H_2O_2 = 33·76 (34·016 I. Wts.).

Syn. Aqua Hydrogenii Dioxidi, U.S. Hydrogenium Hyperoxydatum Solutum, P.Austr.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

The official solution should contain ten volumes of

available oxygen when decomposed—*i.e.*, 1 Cc. will evolve 10 Cc. of oxygen, or 1·45% of its weight = 3·04% by weight H_2O_2. It is also made two and three, and even ten times (Perhydrol, Merck) this strength. Hydrogen Peroxide is produced naturally in many ways, as by the rapid oxidation of some essential oils, oil of turpentine, oil of eucalyptus, &c. It forms the active ingredient in the disinfectant known as Sanitas (*v.p.*564). The solution possesses bleaching properties (is used for bleaching ladies' hair), has a harsh, bitter taste, is odourless, or nearly so. It has the second atom of oxygen in a very loose state of combination. It readily decomposes, especially in contact with a metallic oxide, such as that of silver or manganese, these if moist, and freshly precipitated, cause oxygen to be briskly evolved from it. Ether restrains this decomposition, and this fact is made use of for making Ozonic Ether.

In the official process of estimation, saturated magnesium sulphate solution is better than sodium chloride solution.

Iodometric Determination.—Y.B.P. 1901,71.

Rapid Method of Estimating:—Titrate 2 Cc. in presence of a little dilute Sulphuric Acid with a solution of Potassium Permanganate 5·62 Gm. per litre until decolorised. Each volume of this solution is equivalent to an equal volume of Oxygen. 1 Cc. of 10 volume H_2O_2 decolorises 10 Cc. of the Permangate, and 1 Cc. of 20 volume will decolorise 20 Cc. of it. —C.D. i./06,211. We may append explanation :— $2KMnO_4$ = 5 atoms oxygen .·. 313·74 Gm. = 55·8 litres Oxygen, *i.e.*, 5·62 Gm. = 0·999 litres Oxygen, .·. 1 Cc. of the Permanganate Solution of this strength = 1 Cc. of Oxygen.

Benzoic Acid 0·05% added to Hydrogen Peroxide Solution is said to be a good preservative.

Uses.—Internally is non-poisonous and has been given in diabetes, uræmia and epilepsy, also for pertussis, flatulent dyspepsia and enteric fever. For diarrhœa, vomiting of pregnancy, furunculosis and diphtheria. Is useful for assisting in removing surgical dressings which adhere obstinately. It is valuable as a pigment or spray (M. Arch., 1904, 361) for diphtheria, tonsillitis, laryngeal tuberculosis, putrid bronchitis and non-syphilitic ozœna. Does not precipitate albumin. For tuberculous ulcers, gangrene, malignant pustule and for purulent discharges, is astringent and antiseptic. Wasp and hornet stings are at once relieved.

Guttæ. Otitis may be treated with 10 to 15%, and diphtheritic conjunctivitis with a 3% lotion. Empyemal cavities have been washed out with diluted solutions,

but danger has arisen from embolism by the oxygen evolved.

Heals corneal ulcers.—B.M.J. i./04,432.

Gastric disturbances treated by peroxide of hydrogen internally, 1 drachm before meals.—B.M.J.E. ii./92,43.

Chilblains are well treated with—if broken, borax may be added to it.—P.J. ii./02,17.

Hydrogen Peroxide Solution in ulcerative stomatitis diluted 2 to 3% as a mouth wash; also applied to suppurating buboes and gangrenous or serpiginous forms of soft chancre, comedones, acne and syphilides. For cystitis, an injection 1 to 3% of the solution; in chronic gonorrhœa ½ to 1% generally combined with 1 in 1,000 to 1 in 4,000 solution silver nitrate, good results.—B.M.J.E. i./94,23; i./05,60.

Dioxogen. A coined name for 3% Hydrogen Peroxide solution.

Hydrozone is also a solution of hydrogen peroxide.

Glycozone is a glycerin solution, it evolves oxygen.—L, ii./04,1576.

Capsules (Glass) of Hydrogen Peroxide, 10 volume and 20 volume, are prepared containing 20 minims. These have pointed ends to snap off, and are useful in dentistry and for purposes where a small quantity of solution is required.

Dental Use.—The 20-volume strength can be used for acute or chronic periodontitis and gouty periodontitis by syringing out pockets around affected teeth after removing any calculous or other matter. May also be used for septic root canals.

Ozonic Ether.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Ether containing in solution hydrogen peroxide of 30-volume strength with some alcohol. It is miscible with water, possesses properties similar to the above, and is more stable. In conjunction with Tincture of Guaiacum, it is employed as a test for blood, *v.p.* 832. Hydrogen Peroxide and Ozonic Ether have been given internally for diabetes and whooping-cough, and Ozonic Ether is used locally for scarlet fever.

Under the name **Pyrozone**, an ethereal solution of hydrogen peroxide is much used by dentists for bleaching teeth which have become discoloured from death of the pulp, etc.

Method of Dental Use.—Isolate the tooth with rubber dam, and seal the apex with gutta-percha. The

pyrozone is placed in the cavity on a pledget of cotton wool and volatilised with an air blast from the hot air syringe. Continue treatment for ¼-hour when a small amount may be retained in the cavity by a filling of gutta-percha or oxy-phosphate. Use with great caution in living teeth.

Magnesii Peroxidum is contained in "HOPOGAN."

Dose.—"One third to one whole teaspoonful."

Consists of a white tasteless powder, insoluble in water, containing 15% of Magnesium Peroxide, MgO_2= 55·94 (56·36 I. Wts.), and some Magnesium Oxide, and is for use where increased oxidation is desired; given for anæmia, and in diarrhœa, phthisis, vomiting, etc.—B.M.J. i./03,205; P.J. ii./03,764; L. i./04,35; ii./04,82.

For anorexia, flatulence and pyrosis.—B.M.J.E. i./04,44. Tests suggested.—P.J. ii./04,85.

Tablets contain 0·3 Gm.

Magnesium Perhydrol is similar; useful in uric acid diathesis.—Aertz. Mitteilung, 1905, No. 36.

Oxygen Baths are produced by the interaction of Sodium Perborate and Manganese Dioxide.

Zinci Peroxidum. *Syn.* EKTOGAN, DERMOGEN.

ZnO_2 = 96·67 (97·4 I. Wts.).

A white powder insoluble in water. Has been used locally in skin affections.—P.J. ii./03,764; L. i./04,35.

Promotes the healing of chronic ulcers.—B.M.J.E. i./04,44; L. ii./04,82.

Zinc Perhydrol is similar. 10% ointment or dusting powder are used.

Sodii Peroxidum, Sodium Dioxide, F.E.

Na_2O_2 = 77·52 (78·1 I. Wts.).

A white amorphous deliquescent powder, dissolves in water with production of heat and evolution of oxygen. 1 part mixed gradually with 8 of ice forms a bleaching and antiseptic solution useful in tooth stopping.

Anhydrous Soap containing 10 to 20% Sodium Dioxide and made into a paste with liquid paraffin, used by Unna with success in acne.—P.J. ii./99,506.

Cubes of Sodium Peroxide.

Commonly known as "Solid Oxygen." Are supplied for producing oxygen in a patented **Oxygenator**. This is capable of producing 25 cubic feet of pure oxygen when fully charged.

By patent, No. 11,466, 1901, Jaubert employs a mixture of 200 parts of chloride of lime or the equivalent

quantity of alkaline earth or alkaline hypochlorite in powder, titrating 35·5% of available chlorine, well dried, with 78 parts of Sodium Peroxide.

Oxygen.

O = 15·88 (M.Wt. 31·76) (16 I.Wts., M.Wt. 32).

Oxygen is obtained from the air by first dehydrating and decarbonising it with quicklime; the oxygen is then separated from the nitrogen by being absorbed by caustic baryta exposed under pressure to a high temperature; the barium peroxide formed yields pure oxygen on being heated at a lower pressure; it is sold compressed in **Cylinders** containing 12 or 20 cubic feet and upwards for inhalation from an **Inhalation Bag**. By the aid of this, if desired, the oxygen may be mixed with air as it is administered to the patient. Failing this apparatus the gas may be passed direct into the patient's mouth by means of a glass mouthpiece, or by a glass funnel which is suspended above the face.

Ozone. O_3=47·64 (48 I. Wts.).

Is known as active or tri-atomic oxygen. It is a very powerful oxidising agent, the third atom of oxygen in the molecule being in the labile condition.

The effect of passing electrical currents through oxygen is to produce ozone, which may be recognised by the peculiar scent. When in large quantity it is irritating to the air passages, giving rise to cough and also producing headache. Mildly ozonised air may be inhaled for a few minutes several times a day with advantage in the spasmodic stage of whooping cough.—M.A. 1904,572.

Uses of Oxygen.—Inhalation of **oxygen** is of great service in pneumonia (L. ii./01,840), bronchitis, asthma, angina, and some stages of phthisis, it relieves dyspnœa, and reduces temperature. May be used after chloroform to accelerate recovery. It is the best cardiac and respiratory stimulant. It is inhaled with success in cardiac failure and Bright's disease.

A successful antidote to morphine, opium, strychnine, cyanide, and carbon monoxide poisoning; for resuscitation after partial drowning, and threatened death from inhalation of nitrous oxide.

Its local use is valuable in ulcers and alopecia.

Endovenous injection of 120 Cc. of oxygen slowly in the case of a patient *in extremis*.—L. i./03,75.

Injected hypodermically into the cellular tissue is rapidly absorbed, and produces local mechanical and chemical action.—L.i./06, 1268.

Consumption arrested at the Oxygen Hospital, also ulcers distinctly improved by.—L.ii./03,274.

Liquid Air.

Consists mainly of oxygen and nitrogen, and when freshly

prepared is a nearly colourless liquid boiling at −190°C. As the more volatile nitrogen evaporates the temperature rises and the liquid assumes a bluish tinge—the colour of liquid oxygen. With the exception of oxygen, and chlorine which has a yellowish tinge, most gases are colourless in the liquid condition.

Air Liquefying Apparatus (Hampson's Patent).

This apparatus depends upon a method by which a moderate amount of refrigeration, produced by the expansion of a gas, may be accumulated and intensified till it reaches the point at which the gas becomes liquid under atmospheric pressure. The method consists in directing all the expanded gas, immediately after its expansion, over the coils which contain the compressed gas that is on its way to the expansion point. The cold developed by expansion in the first expanded gas is thus communicated to the on-coming compressed gas, which consequently expands from, and therefore to, a lower temperature than the preceding portion. It communicates in the same way its own intensified cold to the succeeding portion of compressed gas, which in its turn is made colder both before and after expansion than any that had gone before. This intensification of cooling goes on until the expansion temperature is far lower than it was at starting, and the effect is so powerful that even the small amount of cooling due to the free expansion of gas through a throttle-valve may be made to liquefy air without using other refrigerants.

The amount of refrigeration due to free expansion was ascertained by Joule and Thomson, and is in the first place proportional to the fall of pressure. Air at 0°C. is cooled 0·29 of a degree C. for every atmosphere of pressure-drop. This cooling, however, increases with the descent of the temperature from which expansion takes place, and the law is that it is inversely proportional to the square of the absolute temperature. Thus expansion of air from 4½ atmospheres to 1, and from a temperature of 0°C., *i.e.*, 274° Absolute, gives about 1° of cooling in the air itself. But when the air expands from $\frac{2}{3}$ of that absolute temperature, *i.e.*, from 91°C., the cooling for the same pressure drop is $\frac{9}{4}$ of 1°, or 2¼°.

In the liquid state air occupies $\frac{1}{800}$th part of its ordinary volume, or in other words if liquid air be vaporised and restored to normal temperature it will expand 800 times.

Vacuum Vessels (Thermo-Isolators)

Are necessary for the storage of liquid air and those gases which only liquefy at low temperatures.

Vacuum vessels are either cylindrical or globular in shape, and consist of one glass vessel enclosed within another. The space between these vessels is thoroughly exhausted and sealed under a high permanent vacuum. Heat radiates across the vacuous space very slowly, consequently liquid stored in a vacuum vessel is admirably insulated from the action of external heat and only vaporises slowly.

The efficiency of the vacuum vessel is increased by silvering as radiation from outside is thus partially reflected.

Liquid air evaporates from vacuum vessels at the rate of from 5% to 15% per 24 hours, according to the size of the

essel, the evaporation from small vessels being more rapid han from large—Brin's.

A charcoal vacuum (*c.f.* p. 217) is employed in the new metallic containers for liquid air.—Dewar, C.D. i./06, 909.

Hydrogen Liquefying Apparatus of Prof. Morris W. Travers.

It has been found that hydrogen, when compressed at ormal temperatures and allowed to expand in an apparatus ike the Hampson Air Liquefier, does not become cooled, but n the contrary, slightly heated. When, however, its temperature is reduced to −80°C., or lower, before it enters the egenerator coil, it becomes further cooled on free expansion, o that the principle of self-intensive cooling employed in Hampson's Air Liquefier can then be applied to the liquefaction of this gas.

For further information on liquefaction of gases, *see* "The Experimental Study of Gases," by Prof. Morris W. Travers.)

HYDROQUINONE.

Syns. QUINOL, HYDROCHINON (German).

Dose.—½ to 5 grains (0·032 to 0·32 Gm.).

$C_6H_4(OH)_2$ 1 : 4 = 109·22 (110·048 I. Wts.).

An isomeride of Resorcin $C_6H_4(OH)_2$ 1 : 3, and Pyrocatechin 1 : 2. May be prepared from quinic acid by dry distillation, but is principally obtained as a derivative of coal tar. It has a sweetish taste, is ***soluble*** 1 in 20 of water, also in alcohol and ether, and slightly in olive oil. It possesses stronger antiseptic and antipyretic properties than Resorcin, also resembles carbolic acid.

Is used as a developer (*v.p.* 604.).

HYOSCINA.

$C_{17}H_{21}NO_4 = 300·93$ (303·208 I. Wts.) (+ Aq.)

A thick syrupy alkaloid, isomeric with cocaine (?) contained in *Hyoscyamus niger*, different species of *Scopola*, *Datura alba*, the flowers of which yield 0·5%, and other solanaceous plants.

Ernst Schmidt maintained that Hyoscine consists principally of **Scopolamine**, and that the commercial Hyoscine hydrobromide consists essentially of Scopolamine Hydrobromide. From a therapeutic point of view this is simply an alteration of name, *v.pp.* 153, 749.

According to Hesse, Hyoscine (optically active Scopolamine) in alcoholic solution containing a trace of alkali is quickly changed into Atroscine.

Atroscine or *i*-Scopolamine is an isomer of Hyoscine. It was obtained by him from commercial Scopolamine

Hydrobromide as two hydrates. Anhydrous Atroscine Hydrobromide melts at 181°C. and is optically inactive. Atroscine splits up into Oscine and Atropic acid—

$C_6H_5.C<^{CH_2}_{COOH}$ α phenyl acrylic acid = 146·95 (148·364 I. Wts.), when treated with dilute potash. He indicates the following relationship of these alkaloids :—

Hyoscyamine ⟶ Atropine ⟶ Tropine + Atropic Acid.
Hyoscine ⟶ Atroscine ⟶ Oscine + Atropic Acid.—
P.J. i./∞,116.

Oleum Hyoscinæ, 1% in Castor Oil. Causes a mydriasis which is certain, quick in onset, and of transient effect. **Unguentum Hyoscinæ**, Hyoscine ½, Lard 99½, heat to dissolve. (R.O.H. has Hyoscine Hydrobromide ½, Glycerin *q.s.*, Soft Paraffin 100.)

Hyoscinæ Hydrobromidum (*Off.*). **Scopolaminum Hydrobromicum, P.G. iv., U.S., Ph. Ned.** $C_{17}H_{21}NO_4.HBr.3H_2O$ = 434·92 (B.P. and U.S. Wts.) (438·224 I. Wts.).

In white rhombic crystals, soluble 1 in 4 of water, 1 in 14 of alcohol. Melts at 193° to 194° C. (*Off.*); 180° C.—P.G. iv. *Dose.*—$\frac{1}{200}$ to $\frac{1}{100}$ grain (0·00032 to 0·00065 Gm.), increased to $\frac{1}{50}$ grain.

Guttæ Hyoscinæ, R.O.H., 0·5 in 100.—**St. Thos. H.**, 0·5 or 1%.

Guttæ Hyoscinæ et Cocainæ, St. Thos. H. Hyoscine Hydrobromide 0·5, Cocaine Hydrochloride 1·0%

Injectio Hyoscinæ Hypodermica. 1 grain in 200 minims. *Dose.*—1 to 2 minims.

Liquor Hyoscinæ Hydrobromidi, 1 in 1,000 of chloroform water. *Dose*, 3 to 15 minims (0·18 to 0·9 Cc.)

Pilula Hyoscinæ Hydrobromidi, $\frac{1}{150}$ grain.

Hypodermic Tablets, $\frac{1}{200}$, $\frac{1}{100}$ and $\frac{1}{75}$ grain in each. Severe poisonous effects from $\frac{1}{12}$ grain.—L. i./04,24.

Scopolamine-Morphine Anæsthesia (Schneiderlein). This has been used to produce general anæsthesia. Scopolamine Hydrobromide $\frac{1}{200}$ to $\frac{1}{64}$ grain (B.M.J.E. ii./01,44) or more, and a salt of Morphine $\frac{1}{7}$ to $\frac{1}{2}$ grain are injected on the evening before the operation, and a similar or higher dose in the morning before the operation. This alone may suffice to produce deep sleep. If not, ether may be given, or Schneiderlein applies a few drops of chloroform or ether until complete anæsthesia occurs. Patients

sleep for hours through the first painful periods after the operation.

Scopolamine Hydrobromide $\frac{1}{500}$ grain, Morphine Hydrochloride $\frac{1}{5}$ grain in 15 minims of water at 4, 2, and 1 hour before the operation. Anæsthesia lasts 24 hours.—B.M.J. i./05,445. Volckman's method is similar. $\frac{1}{1000}$ grain with $\frac{1}{6}$ grain, also $\frac{1}{1200}$ grain with $\frac{1}{12}$ grain respectively.—L. i./06.24. There is marked reduction in the liability to vomit.

Hyoscinæ Hydrochloridum.

$C_{17}H_{21}NO_4.HCl.2H_2O = 372{\cdot}88$ (375·698 I.Wts.).

In large crystals, similar to the hydrobromide.

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ (0·00032 to 0·00065 Gm.).

Hyoscinæ Hydriodidum.

$C_{17}H_{21}NO_4.HI = 427{\cdot}83$ (431·186 I. Wts.).

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ (0·00032 to 0·00065 Gm.), increased. In crystals, with properties like above.

Ophthalmic Discs contain $\frac{1}{500}$ and $\frac{1}{200}$ grain.

Uses.—Hyoscine is a powerful narcotic, especially useful in cases of insomnia, in calming excitement and delirium and producing sleep in acute mania. In such cases even double doses may be given. It is said to have no influence on the respiration, but to increase the action of the heart and circulation.

As little as $\frac{1}{480}$ gr. dilates the pupil in 18 minutes.—Dixon, *q.v.* for further details of its actions and constituents.

Relieves chorea, asthmatic attacks, pertussis and paralysis agitans, and the tremor of alcoholic excess.

Locally applied it produces rapid, energetic, but brief mydriasis; should be avoided in acute glaucoma.

May be used in solution one-fifth the strength of atropine solution, and does not cause dryness of throat.—P. J. ii./94,545. Preferred to atropine in ophthalmic practice.—L.ii./93,1503.

In treatment of morphine and cocaine habits hyoscine certain and devoid of danger.—P.J. ii./05,617; but reports are contradictory.—M.A. 1904,542.

Given in doses of $\frac{1}{200}$ to $\frac{1}{180}$ grain in Chloroform water by the mouth, checks nocturnal spermatorrhœa.—A.W.W.

As ***Antidote*** Pilocarpine or Caffeine should be administered, also Tannin and Tea, after emetics and use stomach pump.

HYOSCYAMINA.

$C_{17}H_{23}NO_3 = 287{\cdot}05$ (289·224 I. Wts.).

Dose.—$\frac{1}{120}$ to $\frac{1}{40}$ grain (0·00054 to 0·0016 Gm.), in cases of mania increased to $\frac{1}{15}$ or $\frac{1}{8}$ grain dissolved in water by means of diluted sulphuric acid, or in a pill.

Antidotes. *See* Atropine.

An alkaloid obtained from *Hyoscyamus niger*, Henbane.

Hyoscyami Folia (*Off.*). (Henbane Leaves.) Consist of the fresh leaves, flowers and branches, also the leaves and flowering tops separated from the branches and carefully dried. Collected from the flowering biennial plants.

Uses.—Similar to those of belladonna and stramonium. U.S. directs flowering leaves and tops (second year's growth) yielding not less than 0·08% mydriatic alkaloids.

Extractum Hyoscyami Viride (*Off.*).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

The juice of fresh henbane heated to 93·3° C. (200° F.) and the coagulated albuminous matter rejected.

Succus Hyoscyami (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.). The juice expressed from fresh Henbane 3 with Alcohol 90% 1.

Tinctura Hyoscyami (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.). Powdered Hyoscyamus leaves and tops 1 in Alcohol 45% to 10.

Oleum Hyoscyami, P.G.iv. Macerate Hyoscyamus leaves 4, in Alcohol 90% 3, several hours, then mix with Olive Oil 40, and drive off the alcohol on a water bath.

Extractum Hyoscyami, U.S. Contains 0·3% mydriatic alkaloids, is made by concentrating fluidextract. *Average dose.*—1 grain (0·065 Gm.).

Powdered Extract of Hyoscyamus of Commerce contains 0·5% alkaloids.

Fluidextractum Hyoscyami, U.S. *Average dose.*—3 minims (0·18 Cc.). Strength 1=1; hydro-alcoholic percolate, standardised to 0·075% mydriatic alkaloids.

Extractum Hyoscyami, Ph. Ned., is made with alcohol 60% from the leaves; that of **P. Belg.** contains 0·3% alkaloids.

The dried leaves are said to contain as much as 0·25% of total alkaloid of which three-fourths may be Hyoscyamine. (Hyoscyami Folia should consist of leaf only—not the branches and flowers. The *tincture* should be 10% strength in alcohol 70%, the *extract* should be solid "containing about 10% of water," and should be prepared by alcohol 70%—C.U.D.) Hyoscyamine is also contained in *Atropa*

Belladonna, Duboisia myoporoides, Datura Stramonium, Scopola Carniolica, S. Japonica, and other atropaceous plants.

Lactucarium, U.S. *Average dose.*—15 grains (1 Gm.).

The concrete milk juice of *Lactuca virosa* (*Compositæ*). Brownish masses with opium-like odour and bitter taste, partly soluble in alcohol and in ether.

Tinctura Lactucarii, U.S. 1 in 2. *Average dose.*—30 minims.

Syrupus Lactucarii, U.S. (1 in 20). Tincture of Lactucarium, U.S., 100, Glycerin 200, Citric Acid 1, Orange Flower Water 50, Syrup to 1,000. *Average dose.*—2 drachms for insomnia.

The presence of a mydriatic alkaloid in this plant, the strong scented lettuce, has also been determined. Its identity with Hyoscyamine is, however, not as yet certain.—P.J. i./04,186.

Schmidt recently found in :—

Datura Metel.—Leaves 0·55%, and the seeds 0·5% of scopolamine.

Datura arborea.—All parts of this plant contain scopolamine principally, with some hyoscyamine.

Datura quercifolia.—Leaves contain 0·4% and the seeds 0·28% of alkaloid calculated as scopolamine ; hyoscyamine is also present.

Hyoscyamine is an isomer of Atropine, into which it can be converted by heating or acting upon it with alkali. It is in light snow-white crystals.

Soluble 1 in 120 of water, freely in alcohol, chloroform and ether. Is alkaline in reaction, and melts at 108°—109° C.

Hyoscyaminæ Hydrobromidum, $C_{17}H_{23}NO_3HBr$ = 367·4 (B.P. and U.S. Wts.) ; (370·192 I. Wts.).

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain (0·00032 to 0·00065 Gm.), increased.

In small white crystals, soluble about 2 in 1 of water.

Does not yield precipitate with platinic chloride (difference from most alkaloids) U.S.

Hyoscyaminæ Sulphas. (*Off.*)

$(C_{17}H_{23}NO_3)_2H_2SO_4,2H_2O$ = 707·2 (712·556 I.Wts.). (U.S. without water = 671·43.)

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain (0·00032 to 0·00065 Gm.)

In small white granular deliquescent crystals, soluble in water 2 in 1 and about 1 in 4 of alcohol 90%.

Injectio Hyoscyaminæ Hypodermica.

Hyoscyamine Sulphate 1 grain, Distilled Water 2 drachms. *Dose.*—1 to 2 minims.

Hypodermic Tablets of Hyoscyamine Sulphate contain $\frac{1}{100}$ and $\frac{1}{50}$ grain.

Ophthalmic Discs contain $\frac{1}{5000}$ grain.

Pills and **Granules** of **Hyoscyamine** containing $\frac{1}{100}$ grain (or 0·00065 Gm.) are used for sea-sickness. *Dose*, one hourly if required. Given occasionally a day or so beforehand, and for the first few days on board.—B.M.J. ii./93,596.

Uses.—As a mydriatic it acts like atropine, but with greater intensity, while the duration of effect is about equal. Is twice as powerful.—Dixon.

It removes the pain of neuralgia, has cured mercurial tremor, senile trembling, and paralysis agitans, and relieves puerperal mania and delirium tremens.

When used hypodermically, is most valuable in calming the violence of a furious maniac, or a noisy general paralytic.

Use in mania, $\frac{1}{16}$ grain given three times a day, increased to $\frac{1}{8}$ or $\frac{1}{4}$ grain as single doses; requires care.—B.M.J. ii./85.629.

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Duboisinæ Sulphas. From the leaves of *Duboisia myoporoides*; is in amorphous granules, very hygroscopic. Duboisine is identical chemically with, and physiologically similar to hyoscyamine.

It has been recommended as a sedative in mania and hystero-epilepsy, and for paralysis agitans.

Cases of toxic symptoms, giddiness, delirium, and dryness of the mouth from use of eyedrops 4 grains to the ounce.—B.M.J.E. i./93,72.

Guttæ Duboisinæ Sulphatis R.O.H. 0·25 in 100.

Ophthalmic Discs are prepared containing $\frac{1}{5000}$ grain of Duboisine Sulphate combined with gelatin.

ICHTHYOCOLLA (P. Belg.)

Isinglass.

The swimming bladder of certain species of *Acipenser* (Sturgeon—*Sturiones*), and the hake; dried and sliced into thin pieces. Is used in the form of jelly, about 3 drachms to the pint of water. Is also employed for

refining wine. ***Soluble*** in warm water, not in cold. Added to milk to prevent formation of tough curds difficult of digestion.

Solution of Isinglass (*Off.*) Isinglass 2, warm water *q.s.* to 100.

Isinglass has been obtained from *Polynemus Indicus*, *P. plebejus*, *Arius* species, *Belone megalostigma*. Information is, however, scanty as to its source.—P.J.ii./04, 891.

It is very suitable for making Plasters and Gold Beaters' Skin (*c.f. also* **Animal Membrane**), *e.g.*, the following:—

Isinglass on Muslin, 8 inches wide, yard rolls. White, black, or flesh-coloured.
Isinglass on Muslin, 11 inches wide, 5 yard rolls. White, black, or flesh-coloured.
Isinglass Tapes, ¼, ½ and 1 inch, 10 yard lengths.
Isinglass on Silk, 7 inches wide, flesh coloured, black, and white, yard rolls.
Isinglass on Gold Beater's Skin, 6 in. wide, 1 yard rolls, Zinc Oxide, Tapes, ½ and 1 inch, 5 yard lengths.

ICHTHYOL (F. Ital.)

Syn. AMMONIUM SULPHO-ICHTHYOLATE (P. Belg.)

Dose.—10 to 30 grains (0·65 to 2 Gm.) per diem.

A viscous, brownish, substance, with a disagreeable tarry odour, containing about 15% of sulphur, is obtained by treating the products of distillation of a bituminous quartz of fish origin (hence its name), found in the Tyrol, with sulphuric acid and neutralizing with ammonia. The ammonia combination is distinctively known as **Ichthyol**.

Soluble in water, glycerin, ether, fats, oils, and partially in alcohol 90%. ***Uses.***—Internally has been given for rheumatism and skin affections, and as an intestinal antiseptic in constipation and dyspepsia. It forms a valuable application for chronic skin diseases, as eczema, psoriasis, acne, and favus; as an embrocation, it relieves the pains of chronic rheumatism. The odour may be disguised with Oil of Citronella, which is itself used in Ceylon for rheumatism. Applied on wool as vaginal tampon, and as pessaries and suppositories, and as injections 1 to 3% in gonorrhœa, cystitis and vaginal discharges. Also applied to cracked nipples, superficial burns and erysipelas. For prurigo senilis a 30% solution in water is

recommended; for pruritus, and ulcers a 10% solution; may be combined with preparations of lead and mercury without the formation of sulphides.

Lithii Sulpho-ichthyolas.
Dose.—10 to 30 grains (0·65 to 2 Gm.) per diem.

Sodii Sulpho-ichthyolas.
Dose.—10 to 30 grains (0·65 to 2 Gm.) per diem.

Zinci Sulpho-ichthyolas: For external use.

Capsules of **Ammonium-Ichthyol** and of **Lithium-Ichthyol,** 4 grains (0·25 Gm.) separately (or combined 2 grains of each). *Dose*—1 or 2.

Collodion 7 parts, with Ichthyol 1 part, is used for eczema, erysipelas, and other skin diseases.

Mistura Ichthyol.
Dose.—1 to 3 drachms in water.
Ichthyol 6, Simple Elixir 5, Water 2. Another form is Ichthyol 2, Peppermint Water 16, Syrup 4.
Reduces expectoration and cough in phthisis,

Pills of *Ammonium Ichthyol, 2½, **Lithium-Ichthyol,** 1½, or **Sodium-Ichthyol,** 1½ grains.

Tablets, 2½ grains (0·165 Gm.). *Dose.*—1 or more.

Pessaries of Ichthyol, 10% strength, with either Gelatin or Cacao butter basis are used for leucorrhœa, and 2 to 5% in gonorrhœa of the female.—L. ii./04,1223; also made with **Resorcin** 3%; and can be prepared with glyco-gelatin basis. Should be recently made. *See also* **Ovules,** *p.* 527.

Suppositories of Ichthyol may contain 3 grains (0·2 Gm.) with a basis of beeswax 1 and oil of theobroma 2, or may be made very satisfactorily with Glyco-gelatin basis. They may also be prepared with starch jelly with a little formalin added as preservative.

Unguentum Ichthyol may be made to contain from 20 to 50% with lanolin or with olive oil and lard. For psoriasis.

Ichthyol Resorcin. Ichthyol mixed with 10% of Resorcin for external application.

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* To make small, mix Ammonium-Ichthyol 120, Magnesium Oxide 15, Water 120, and evaporate to dryness with stirring, may be massed again with water, 2 grains = 3 grains Ichthyol.—C.D. i./04,444.

Unguentum Ichthyol Compositum, G.H. Ichthyol 1, Solution of Lime 9, Hydrous Wool Fat 5, Soft Paraffin 10, Zinc Ointment 5.

Ichthyol Paste, recommended by Unna for acne rosacea. Starch 40, moisten with Water 20, and rub in Ichthyol 40, and lastly strong solution of Albumen, 1 or 1½. This is painted on the skin, quickly dries, and is easily washed off. Another formula:—Ammonium Ichthyol 25, Carbolic Acid, 2½. Dissolve in warm water 22½, and mix with starch 50.—L. i./91,622; B.M.J.E. i./91,102.

In anal fissure unsuitable for operative treatment, or where such is refused, the following paste has been tried applied warmed once or twice daily.

Ichthyol 80, Belladonna Extract 8, Cocaine Hydrochloride $\frac{1}{20}$.—N.Y. Med. Jl., June 11, 04; in M.A. 1906, 123.

Gonorrhœa, treatment by irrigation with 1 to 2% solution.—L.i./97,1195. **Lock Hospital** uses 2 to 5%.

Gauze wick soaked in Ichthyol 4% to 10% with Silver Nitrate 4% to 10% introduced with aid of a tube which contains the wick. The tube is pulled out leaving the wick *in situ*, in gonorrhœa.—M.A., 1906, 235.

For burns it may also be used dry, diluted with zinc oxide or bismuth (the powder being spread evenly over the surface), in ointment (10 to 50%), or as combination of above methods.

Internal use checks the suppuration of tubercular glands.—L. ii./03, 384; L. i./04,296.

In smallpox 40-grain doses thrice daily of doubtful advantage.—Glas. Med. Jl., Nov. 1905, 343.

Petrosulfol.

An Ammonium compound prepared from a pitch containing sulphur, has similar properties physical, chemical, and therapeutical to the corresponding Ichthyol compound. Used for boils, chilblains, eczema and impetigo.

Ichthalbin. *Dose.*—¾ to 15 grains (0·05 to 1 Gm.).

A combination of ichthyol and albumen, is an odourless and tasteless brown powder. Used internally for eczema, nervous intestinal affections and during convalescence from fevers.

Ichthyol-Salicyl is a powder made with either 25, 33⅓ or 50% of sodium salicylate; recommended for

psoriasis, acne rosacea and for rheumatic pains, and has been given internally in pills for tuberculosis.

Ichthoform. A compound of Ichthyol and Formaldehyde. Insoluble in water.

Dose.—1½ to 5 grains (0·1 to 0·3 Gm.).

Used as antiseptic in the intestinal disorders occurring in tubercular diseases.—L. i./04,717. Combined with Salacetol in a cachet this substance acts as a useful intestinal antiseptic in catarrhal conditions.

Thigenol is similar but a sodium salt; a 5% ointment relieves eczema.—B.M.J.E.ii./03,15.

Sphagnol.

A native tar product said to be produced by the decomposition of peaty deposits in the earth. Sphagnol is employed with success in blepharitis, eczema, piles, sores and burns. Is detergent and relieves insect bites in tropical countries.

Sphagnol Ointment 10%. **Medical Soap** (15%) and **Toilet Soap** (5%) are prepared.

Sphagnol Suppositories, 3 grains in each, are used for piles.

Thiol. *Dose* (of dry) 2 to 10 grains (0·13 to 0·65 Gm.) in pills.

A mixture of sulphonised hydrocarbons, prepared by heating gas oil, obtained in the distilation of coal, with sulphur. Occurs in two forms, (1) in dry black laminæ or powder; and (2) **Thiol Liquidum**, a syrupy liquid containing about 40% of the latter. Is miscible with vaseline, lanolin and other ointment bases. Thiol is soluble in water, alcohol, and ether; but is precipitated on addition of acids. It is very similar in composition and properties to ichthyol, and is recommended in eczema, intertrigo, erysipelas and burns. For uterine inflammation and ulcerations of the cervix.

In skin affections:—

Pigment, Thiol Liquid 4, Glycerin 2, to be painted on the part with camel's hair brush,

Ointment, containing Thiol Liquid 1, Vaseline 3, Lanolin 6.

Collodion, containing Thiol Powder 1, Collodion 19.

Pills, Thiol Liquid 1 drachm, Althæa Powder *q.s.* For 40 pills. Two thrice daily.

Pasta Thiol et Zinci contains 10% Thiol and 20 Zinc Oxide. In pruritus of the female genitals.

Isarol is a preparation similar to Ichthyol.

Tumenol is similarly a sulphonised mineral oil in the form of a brown mass. Has antiseptic properties, 2% dusting powder is employed for eczema and lupus.

Ferrichthol. *Dose.*—1 to 3 tablets thrice daily.

A preparation of Iron and Ichthyol in tablet form.

INFUSA CONCENTRATA.

It is acknowledged to be a difficult matter to preserve the flavour of drugs in concentrated infusions. The process usually employed for making concentrated infusions commercially is to percolate with a dilute alcohol, *e.g.*, 20%. For export 25% is used.

Recently Farr and Wright have recommended dilute Chloroform Water (Chloroform 1 in Water 1,000).—either (*a*) by **Macero-Expression** in which the amount of drug required per pint is macerated in 15 ounces of the menstruum in a closed vessel for 24 hours, strained, pressed and the alcohol or tincture necessary then added and maceration repeated two or three times. The two latter liquors are evaporated and added to the first and made up to one pint. (*b*.) The **Repercolation Method** consists in moistening half the drug with the menstruum and percolating. The other half is then moistened and percolated with the first percolate—percolation being continued to complete exhaustion. The weak liquors are evaporated and added to the stronger. The bulk is then made up to volume. This is the easier procedure.

Broom, by (*b*), but not very satisfactory. **Buchu**, by (*a*) using dilute alcohol and add tincture 1 ounce, to each pint. Diluted, however, not equal to the fresh article. **Calumba**, by (*a*) heating finally to 85° C. for 5 minutes. **Cascarilla**, by (*a*) adding 6 drachms tincture to each pint. Diluted as good as infusion. **Chamomile** (*b*), with dilute alcohol, adding 1 drop of oil for each ounce of flowers used. **Chiretta** (*b*), satisfactory. **Clove**, not satisfactory. **Cusparia** (*a*), good. **Digitalis** (*a*), similar to B.P.C., good. **Gentian Compound** (*a*), adding 2 drachms of orange and lemon tinctures to the pint. **Hops** (*a*), with alcohol. Use old hops. **Orange** (*b*), adding tincture 1 ounce. **Orange Compound** (*a*), adding 1 ounce orange and lemon tinctures. **Quassia** (*b*). **Rhatany** (*a*), if with alcohol more body, but not like official article. **Rhubarb** (*b*). **Roses** (*b*), with acidulated alcohol. **Senega** (*b*), with alcohol and a little ammonia. A little wintergreen oil to be added to finished product. Deposits in time. **Senna** (*a*), with alcohol and add essence of ginger ½ ounce to pint. Diluted is as good as the fresh infusion. **Serpentary** (*b*). **Valerian** (*b*), with addition of a little ammonia. Diluted, is superior to the fresh infusion.—P.J. i./06,163; C.D. i./06,252. Yields of extractive.—P.J.i./05,435.

IODOFORMUM.

Iodoform (*Off.*) TRI-IODOMETHANE.

CHI_3=390·61 (B.P. and U.S. Wts.) (393·918 I. Wts.).

Dose.—½ to 3 grains (0·032 to 0·2 Gm.)

Iodoform is ***manufactured*** by acting upon Alcohol with Iodine in the presence of Caustic Potash solution at a temperature of about 70° C. It is also produced by the electrolysis of an aqueous solution of Potassium Carbonate, Potassium Iodide and Alcohol.

In yellow hexagonal crystals, with disagreeable odour, containing 96·7% iodine.

Soluble 1 in 8 of absolute ether, 1 in 10 of ether (Sp. Gr. 0·735), 1 in 12 of chloroform, 1 in 95 of 90% alcohol, 1 in 14 of oil of eucalyptus, 1 in 10 of collodion, 1 in 60 of vaseline and oil of almonds, and about 1 in 30 of olive oil. It is almost insoluble in water, but dissolves 1 in 10 of Rubini's solution of Camphor, which disguises its odour.

Iodoformi Pulvis, as sold, is in reality in very minute crystals. It is preferred for surgical purposes; it does not clot, can be used in a dredger.

Iodoformum Præcipitatum has a slight tendency to agglomerate. It is used for dusting on sores, and should be employed for preparing ointments for the eyelids.

Method of determination of purity and amount in gauze.—P.J. i /05,721.

Iodoformum Aromaticum is scented with Coumarin, 1 in 50.

Iodoform when used for chancres is best applied in ethereal solution, or as powder dusted on and covered with boric acid ointment or gold-beater's skin, or painted over with flexible collodion.

Uses.—Iodoform possesses powerful antiseptic as well as slight anæsthetic or sedative properties. It is most poisonous to the virus of syphilis and gonorrhœa and, although it contains $\frac{2}{3}\frac{9}{0}$ of its weight of iodine, it is not an irritant, like the latter, either taken by the stomach or applied topically.

To cover its characteristic odour it may be mixed with balsam of Peru, oil of geranium or eucalyptus, phenol, oil of anise, Sanitas oil, otto of rose, tannic acid, oil of sassafras, creolin, thymol, menthol or coumarin.

Other suggestions for covering the odour of iodoform:—(*a*) Carbolic Acid 1% and Peppermint Oil 2%, (*b*) Cyllin $\frac{1}{2}$ to 1%, (*c*) Rosemary Oil 1%, (*d*) Thymol 1%, (*e*) Powdered fresh roasted Coffee 10%.

Taken internally, Iodoform decomposes, and iodine is soon found in the urine; not being an irritant like iodine, it has been given with good effect when the latter is indicated, and has been of service in cases of irritation of the brain and spinal cord, tertiary syphilis and cirrhosis of the liver, also given to kill tapeworm.

Incompatible with calomel, silver and other nitrates, potassium chlorate, and nitrites.

A formula for a **Liquid Iodoform Soap** compound is given (C. D. i./06,162, abstracted from a foreign journal), but our experiments, in the hope that this would prove a useful preparation, failed entirely, as the iodoform is thrown out in a crystalline condition.

A modified formula, P.J.i./06, 599 is given;—

Dissolve Potassium Hydroxide 35 Gm. in Water 25 Gm. Pour in gently 50 Gm. Oleic Acid and 30 Gm. of a mixture of 90 volumes of Alcohol 94% (V.) and 10 volumes of Ether. Add 30 Gm. of finely powdered Iodine, in portions of 3 to 4 Gm. at a time, waiting for solution of each before adding further. Finally make up to 500 Gm. If "made up" with alcohol a clear liquid is produced with white sediment, which we found to contain Potassium Iodide and Potassium Iodate. If "made up" with water, as directed by the original paper, a thick soapy liquid is produced, from which the Iodoform very shortly crystallises in fine yellow scales. It is obvious that in the above form there is at the outset about 25 Gm. of Potash in excess of the amount necessary to combine with the Oleic Acid. Furthermore, theoretically, about 33½ of Potash reacts with 101 of Iodine and 4½ of Alcohol to form 39½ of Iodoform, so that roughly the Liquid Iodoform Soap contains a little over 2% Iodoform. As is well known more than ½ the Iodine is lost, being converted into Iodide and Iodate.

$(6KOH + 4I_2 + C_2H_5OH = CHI_3 + HCOOK + 5H_2O + 5KI.)$

Buginarium Iodoformi.

Nasal bougies having a gelato-glycerin basis and containing $\frac{1}{6}$ to $\frac{1}{2}$ grain of Iodoform in each. As they gradually dissolve, the action of the Iodoform is sustained.

Glutoid Capsules of Iodoform.

Capsules (to show absence of pancreatic secretion), containing iodoform surrounded by glutoid (*v.p.*363), a substance which is insoluble in the gastric and intestinal secretions but soluble in the pancreatic secretion, are prepared. If the pancreatic secretion is active, the glutoid wall of the capsule is dissolved and the iodoform is set free. Iodine in the form of iodides and iodates can then be demonstrated in the saliva by testing with chloroform and a little dilute nitric acid. The test is a useful means of demonstrating, firstly the length of time that food (in this instance the capsule) remains in the stomach, and secondly whether the pancreatic secretion is active or not. If no iodine reaction is obtainable in the saliva after the administration of the capsule it may be

concluded either that the capsule has not passed from the stomach, or that the pancreatic secretion is in abeyance.

An individual suffering from pancreatic infantilism took a capsule. No iodine could be detected in the saliva, but the capsule had passed the stomach, for it was found undigested in the stools. A healthy person was tested in a similar manner and the iodine demonstrated in the saliva. The patient before mentioned took, as a second experiment, a capsule of iodoform, and one hour afterwards a dose of Pancreatic Extract was given—in two hours the iodine could be demonstrated in the saliva.—Byrom Bramwell, Clinical Studies, vol. ii., 1904, p. 350.

Pancreatic Infantilism is improved by administration of Pancreatic Extract ¾ and 2 grains—0·05 and 0·15 Gm. respectively.

Ceratum Iodoformi, R.D.H. Iodoform 1, Hard Paraffin 1.

Collodium cum Iodoformo.

Iodoform 1, Flexible Collodion 12.

Dissolve. Used as a pigment to venereal sores.

Emulsio Iodoformi, U.C.H., G.H.

Iodoform, in fine powder, 1 (Alcohol 90% *q.s.* to moisten, St. Barts., G.N.C., G.H.), Glycerin 7, Boiled Distilled Water 2. Mix well in above order. For injection into sinuses. One or 2 in warm water 80, a useful bladder antiseptic, *vide* also Injectio Iodoformi below.

L. H. has Iodoform 1 shaken in Formaldehyde solution 10% 2; allow to stand, decant as much as possible of the liquid and add sterilised Glycerin to 10.

Another form is Iodoform 2, Mucilage of Acacia 4, Glycerin 2, Water 20; for use in ulcerated or irritable bladder.

Other formulæ and uses.—B.M.J. i./90,922. Lister used simply 1 in 10 of glycerin. In **Glycerinum Iodoformi, K.C.H**, the Iodoform is washed with 1 in 20 Phenol Solution. Watson Cheyne, in preparing the Emulsion, has recommended the Iodoform to be sterilised by previously digesting it three days in 5% Phenol Solution containing Perchloride 1 in 2,000 (all vessels to be sterilised).

Injectio Iodoformi, U.C.H.

Iodoform, in fine powder, 1, Mucilage of Tragacanth 2, Water 7, for bladder injection this is less irritating than the Glycerin Emulsion. C. L. T. E. has Saturated Solution of Iodoform in Ether 1, Olive Oil 2. For injecting in goître.

Iodoform Bone Plugging.

Iodoform 60, Spermaceti (Sterile) 40, Sesame Oil (Sterile) 40.

This forms a stiff mass, becoming fluid at 50° C. Used for temporarily filling excised bone cavities—which must first be thoroughly dried before pouring in the melted plugging.—L. i./05,146.

Iodoform Gauze, 5, 10 and 20% strength, 6 yard pieces; also 5% in 1 and 2 yards in cartons; soothes the pain of burns.

Iodoform Gauze Bandages, 4 inches wide.

Iodoform Gauze soaked in adrenalin solution, packed into apex of vagina, has been employed to arrest hæmorrhage.—B.M.J. ii./04,1054.

As a packing after operation for septic thrombosis of the lateral sinus the gauze should be used thoroughly well saturated with 1: 1,000 sublimate solution, not employed dry.—Archives of Otology, Aug. 1905 (per Glasgow Med. Jl., Dec. 1905,468).

Insufflatio Iodoformi.

Iodoform 2, Starch (carefully dried) 1. In specific affections of the throat, antiseptic and mildly caustic.

Insufflatio Iodoformi Composita.

(W. H. has under the name of **Insufflatio Iodoformi et Morphinæ**) Iodoform 1 grain, Boric Acid 1 grain, Morphine Acetate, $\frac{1}{6}$ grain (**Vict. Park** has Bismuth Oxychloride 1 grain *vice* Morphine).

Iodoform and Eucalyptus Bougies, Cereolus Iodoformi et Eucalypti.

Iodoform, precipitated	...	5 grains (0·32 Gm.).
Oil of Eucalyptus	...	10 minims (0·6 Cc.).
Oil of Theobroma	...	35 grains (2·32 Gm.).

To make a bougie 4 in. long. Used for acute gonorrhœa. For further details *see* earlier Editions.

When the symptoms have subsided, any remaining discharge may be treated by injections of tannin or sulphate or acetate of zinc.

Cereoli, *Wundstäbchen*, P.G. iv., are flexible urethral bougies, tapering at one end, variously medicated, either throughout or on their surface.

Iodoform Varnish (after Whitehead).

Benzoin 4, Storax 3, Balsam of Tolu 1, Purified

Ether 40; dissolve, strain, and add Iodoform 4. For surgical application.

Iodoform Vaseline. Iodoform 1, Vaseline 9. A useful surgical dressing for wounds.

Ophthalmic Discs, contain $\frac{1}{1000}$ grain of **Iodoform** combined with gelatin.

Pasta Iodoformi, R.D.H.

Iodoform 60 grains, Tannic Acid 10 grains, Liquified Carbolic Acid *q.s.*

Cinnamon Paste and Iodoform Paste are also used by Dentists and are understood to mean Iodoform Powder mixed into a paste with Cinnamon Oil. Used for treating septic root canals.

Pastillus Iodoformi.

Contains 1 grain of Iodoform (more or less if prescribed) with 18 grains of glyco-gelatin in each pastil. Useful in syphilitic eruptions of the tongue, mouth, and throat, and in chronic pharyngitis.

Pencils of Iodoform, the thickness of a No. 9 catheter, for uterine medication, are prepared with iodoform, glycerin *q.s.*, and gum acacia 1 in 6.

Pigmentum Iodoformi. *See* **Collodium cum Iodoformo,** *p.* 428.

Pilula Iodoformi. 2 grains.

Dose.—1, two or three times a day.

Plaster Mulls of Iodoform contain 10 grammes in $\frac{1}{5}$ square metre.

Suppositoria Iodoformi (*Off.*) contain 3 grains (also 1 and 5 grains) in each, with Oil of Theobroma *q.s.* For fissure of the anus and irritated hæmorrhoids. May also be used as a **Pessary.**

Unguentum Iodoformi (*Off.*).

Iodoform 1, Paraffin Ointment, yellow, 9.

R.O.H. has 1 to 7. U.S. has 1 in Lard 10.

Unguentum Iodo-Paraffini, U.C.H., Iodo-Vaseline.

Iodoform 1, Oil of Eucalyptus 8; heat gently till dissolved and add to Paraffin 27, Soft Paraffin 6, melted together. Stir till cold.—B.M.J. ii./82,904.

Collapsubes (with Catheter attachment) of **Iodoform and Eucalyptus Ointment** of each 5%, and of **Iodoform 5% and Cocaine Ointment 2%** are useful for the treatment of gonorrhœal diseases.

Wool Absorbent, Iodoform.

50% in 1 lb. rolls, also 10% and 4%. A dressing for wounds and sores.

Iodoform is used in syphilis and naso-pharyngeal affections; in doses of 1 to 2 grains internally, and externally for venereal sores and indolent ulcers where there is no active inflammation. In phlyctenular ophthalmia and ciliary blepharitis an ointment of 1 in 12 of lard has been found useful.

Alveolar abscesses treated by iodoform in conjunction with oil of eucalyptus.—B.M.J. i./80,621.

Soft sores treated by painting with ethereal solution of Iodoform and then covered with a film of collodion or gold-beater's skin.—B.M.J. i./82,340.

Iodoform injections beneficial in goitre.—Pr. lvi.334; P.J. ii./96,59; L. ii./99,516.

Iodoform emulsion injected into tuberculous joints with success.—B.M.J. ii./03,77.

Tuberculous peritonitis, a case of, rapidly recovered under Mercury and Chalk $\frac{1}{2}$ grain with Iodoform $\frac{1}{2}$ grain thrice daily.—L. ii./05,291.

Phthisis treated by intravenous injection of Iodoform $\frac{1}{6}$ grain dissolved in Ether 10 minims containing 40% Liquid Paraffin.—B.M.J. i./05,65.

Succedanea or Substitutes for Iodoform.

Aristol. *Syn.* DI-THYMOL-IODIDE.

Thymolis Iodidum, U.S.

$C_6H_2(CH_3)(C_3H_7)OI$
|
$C_6H_2(CH_3)(C_3H_7)OI$ =545·76 (B.P. & U.S. Wts.) (550·132 I. Wts.)

Obtained by mixing a solution of iodine in potassium iodide with an alkaline thymol solution.

A reddish brown powder, containing 46·2% of iodine, insoluble in water and glycerin, soluble in ether, collodion, and oils; must not be heated or exposed to light. Recommended for psoriasis, lupus, eczema, and for ozæna; and as a dusting powder alone or mixed with 3 parts of talc, for wounds and burns. May be employed (5 to 10%) with soft paraffin, lard, wool fat, or zinc and starch paste basis, such as Lassar's paste, *v.p.* 720.

Unguentum Aristol, St. J. H.

Aristol 9 grains, Soft Paraffin to 1 ounce

Suppositoria Aristol contain 1 grain each and weigh 15 grains (Theobroma basis).

Used with success as insufflation in cancer of cervix uteri —relieves pain, stops bleeding, lessens discharge—is not absorbed, therefore non-toxic.—B.M.J.E. ii./91,155.

'Collapsubes' of Aristol Ointment 10% for venereal diseases of the urethra.

Di-iodoform.—ETHYLENE PERIODIDE.

$C_2 I_4 = 527{\cdot}42$ (531·88 I. Wts.).

In yellow crystals, almost inodorous, soluble in chloroform and slightly in alcohol and ether, insoluble in water; partly decomposed by light. Said to contain 90% iodine.

Europhen.—ISO-BUTYL-ORTHO-CRESYL-IODIDE.

$$\left.\begin{matrix} C_6H_3\,(CH_3)\,(C_4H_9)\,O \\ C_6H_3\,(CH_3)\,(C_4H_9)\,O \end{matrix}\right\rangle IH$$ (?–Schmidt)=450·68 (454·218 I. Wts.)

A yellow powder, containing 27·9% of iodine, with slight odour, insoluble in water and glycerin, soluble in alcohol, ether and chloroform: must not be heated to prepare solutions or ointments. Is non-poisonous, and acts only when brought into contact with secreting surfaces, which decompose it and liberate iodine. ***Incompatible*** with starch and metals. Powder or ointment (1 to 10%) in simple and venereal ulcers, and in oily solution (1 or 2 grains), injected daily for syphilis and may be applied for ozæna and otitis. Tubercular leprosy has been treated by inunction and injection.

Iodoformal.

A compound of ethyl-hexamethylene hydriodide and iodoform; may be used as a dusting powder, or 10% ointment or 20% sticks with gum arabic for chronic gonorrhœa.

Iodol.—*Syn.* TETRA-IODO-PYRROL. **U.S.**

$$\begin{matrix} CI{=}CI \\ | \qquad \rangle NH = 566{\cdot}18 \\ CI{=}CI \end{matrix}$$ (570·928 I.Wts.) (U.S. 566·17)

Dose.–1 to 3 grains (0·065 to 0·2 Gm.).

An almost odourless crystalline, brownish powder, containing 89% iodine, obtained by precipitating pyrrol with iodo-iodide of potassium. It gives off iodine on heating. It explodes if rubbed with mercuric oxide. Decomposes at 140° C. Tests for organic impurities, free iodine, and other iodine compounds are given in U.S.

Soluble 1 in 145 of glycerin, 1 in 6 of absolute alcohol, 1 in 27 of 90% alcohol, freely in ether; also in chloroform and oils. Insoluble in water.

Uses.—Wounds are dressed with it, and its applica-

tion is painless; useful in buboes, indolent and corneal ulcers, and ear discharges.

An ointment, 1 to 5 of vaseline, and a solution, 3 parts to 35 of alcohol and 62 of glycerin, have been used for granular and chronic conjunctivitis with good results; and a solution of iodol 1, alcohol 3, glycerin 21, as a pigment in diphtheria. Also iodol 2, menthol 1, almond oil 96, for throat spray or pigment.

'**Collapsubes**' with catheter attachment of iodol ointment 5, with eucalyptus oil 10%, with soft petroleum basis are useful for urethral medication in the treatment of gonorrhœa.

Iodomenthol. 1% of menthol covers odour of iodol, and is said to render it more active.

Hard and soft chancres and varicose ulcers much improve under its use.

Loretin. META-IODO-ORTHO-OXY-CHINOLIN-ANA-SULPHONIC ACID. $C_9H_4I\,N(OH)\,SO_3H = 348{\cdot}37$ (351·118 I. Wts.).

A yellowish crystalline powder, slightly soluble in water and alcohol, for burns, ulcers, and other wounds.

Griserin.

Dose.—5 to 8 grains (**0·32 to 0·52 Gm.**). To be taken in the morning *fasting* and two hours or so before bedtime.

Consists of **Loretin**, rendered more soluble by addition of sodium carbonate. Internal bactericide used in tuberculosis, lupus, psoriasis, eczema; locally has been used in diphtheritic throats and for wounds as dusting powder. 2% solutions have been tried as urethral injections, *e.g.* in gonorrhœa.

These remarks apply to Griserin-α; Griserin-β, is used externally.

Losophan. Meta-tri-iodo-Cresol.

$C_6HI_3.CH_3OH = 481{\cdot}95$ (485·95 I. Wts.).

A greyish crystalline powder containing 80% Iodine. Soluble in Alcohol 1 in 7, Chloroform 1 in 6, Ether 1 in 4, and in oils and fats. Lotion 1 or 2% in diluted Alcohol has been found useful in parasitic skin affections.

Nosophen. Tetraiodophenolphthalein.

$(C_6H_2I_2OH)_2C-O-C_6H_4CO.$ or $C_{20}H_{10}I_4O_4 = 815{\cdot}32$ (821·96 I. Wts.).

Dose.—3 to 8 grains (**0·2 to 0·52 Gm.**).

A cream-coloured insoluble powder, containing 60% Iodine. Is a dusting powder and insufflation in coryza and rhinitis.

Antinosin. $C_{20}H_8Na_2I_4O_4$=859·08 (866·044 I. Wts.).
The sodium salt of Tetraiodophenolphthalein, *p.* 433.
Dose.—3 to 8 grains (0·2 to 0·52 Gm.).
A soluble blue powder; as an antiseptic for throat affections, and for irrigation in cystitis.

Eudoxin.—The bismuth salt of Tetraiodophenolphthalein, *p.* 433.
Dose.—3 to 8 grains (0·2 to 0·52 Gm.).
A reddish-brown insoluble powder, recommended for use internally in stomachic and intestinal affections.

Isoform. Para-iodo-anisol.
Dose.—2 to 4 grains (0·13 to 0.26 Gm.).
Crystals difficultly soluble, explosive when heated. Supplied mixed with calcium phosphate (equal quantities) as Isoform powder.—P.J. ii./04,634.
Isoform Paste is Isoform and Glycerin, equal parts. Gelatin Capsules and Isoform Gauze are prepared.—B.M.J. ii./04,1324.
2 to 4 grammes daily as an intestinal antiseptic.—B.M.J.E. i./05,91; *e.g.* in dysentery, typhoid and intestinal ulcers.

Vioform (Iodochloroxy-quinoline).
Yellowish powder, insoluble in water. Emulsion: Vioform 1, Glycerin 4, Sterilised Water 4, Alcohol 2.—B.M.J.E. i./03,31.
For dressings.—P.J. ii./05,724; Y.B.P. 1905,271.

Sozoiodol. Di-Iodo-para-Phenolsulphonic Acid.
$C_6H_2I_2\begin{cases}OH\\SO_3H\end{cases}$ (1:4)=422·6 (426·032 I. Wts.).
Contains 59% of Iodine and 7·5% of Sulphur. Has been combined with Sodium $C_6H_2I_2(OH)SO_3Na.2H_2O$=480·24(484·106 I.Wts.),Potassium $C_6H_2I_2(OH)SO_3K$=460·43(464·174 I.Wts.),Mercury $[C_6H_2I_2(OH)SO_3]_2Hg_2$=1240·8 (1250·048 I. Wts.), and Zinc $[C_6H_2I_2(OH)SO_3]_2Zn6H_2O$ = 1015·39 (1023·544 I. Wts.) to form salts which have been suggested as odourless substitutes for iodoform.
The first mentioned is ***soluble*** 1 in 14 of water. It has been given internally in doses of 15 grains for diabetes, and is well tolerated as an external application.
Sozoiodol-Mercury is an orange-yellow powder, and a solution of $2\frac{1}{2}$ grains with Sodium Iodide 5 grains, in 100 minims, has been given in 10 to 15-minim

doses for intramuscular injection in syphilis. Is generally safe, efficacious and painless; but see B.M.J. ii./05,1255 for objections. It is applied to venereal sores, cracked nipples and parasitic skin diseases.

Traumatol, an Iodo-Cresol compound.

A greyish amorphous powder, used as a non-toxic antiseptic. A **Liquid** preparation is also made.

IODUM. (*Off.*)

I = 125·9 B.P. and U.S. Wts. (126·97 I. Wts.).

The following medicinal inorganic iodides contain the halogen in these proportions:—Ammonium Iodide (NH_4I = 143·84) 87·5%, Lithium Iodide (Anhydrous) (Li I = 132·87) 94·75%, Potassium Iodide (K I = 164·73) 76·43%, Rubidium Iodide (Rb I = 212·47 I. Wts.) 59·75%, Sodium Iodide (Na I = 148·78) 84·62%, Strontium Iodide ($Sr I_2 + 6 H_2O$ = 446·02 U.S. Wts.), 56·45%.

Solubilities.—In Water 1 in 5,000, readily in Alcohol 90%, Ether 1 in 4, Chloroform 1 in 30 about, slightly in Glycerin. Very soluble in Potassium Iodide Solution.

Antidotes.—Stomach pump, Emetics, Apomorphine Injection, Starch, Saccharated Solution of Lime, Demulcents and Stimulants; finally, Opiates.

Uses.—Rarely employed internally in free state, *see* Tinctura Iodi. Has, however, been given in epilepsy, and to reduce obesity.

Externally.—Irritates the skin, if too strong will blister and cause scars. Used as counter-irritant painted on chilblains, over inflamed joints, spots of pleurisy, sore gums and scrofulous glands, to abort boils, and is injected in form of tincture to cure hydrocele, *cf.* also Morton's Fluid for spina bifida. For ringworm (*cf.* Coster's Paste). Is inhaled to check profuse expectoration in chronic bronchitis.

Iodine is a powerful germicide. A 1% solution has been stated to be equal to Mercuric Chloride 0·5%.

It has been seriously discussed whether a tolerance of Iodine is not a proof of the existence of syphilis.

Skin rash due to Iodine may resemble variola.

Poisoning by 4 ounces of liniment.—L. i./05,793.

Incompatible with alkalis, alkaloids, starch, soluble lead and mercury salts, carbolic acid, chloral hydrate and sodium thiosulphate.

Calcii Iodidum, $CaI_2 = 291{\cdot}51$ (294·04 I.Wts.).

Dose.—2 to 4 grains (0·13 to 0·26 Gm.) Deliquescent crystalline powder. Excellent results in foul ulcers and chilblains.—B.M.J. ii./06,138.

Chloroformum Iodi, 1 in 10.

Stains less and does not promote desquamation, itching or dermatitis like alcoholic solution.—L. i./06,1190.

Glycerinum Iodi.

Iodine 1, Glycerin 50. Heat carefully till dissolved—is not a mere solution, some decomposition of glycerin takes place. A useful pigment, the skin does not harden by repeated application, nor peel off. Water helps solution, *c.f.* Morton's Fluid.

Glycerinum Iodi, G.H., is Morton's Fluid, C.L.T.E., *sine Aqua.*

Injectio Iodi Hypodermica Fortissima.

Iodine 360 grains, Potassium Iodide 360 grains, Distilled Water 4½ drachms. Should measure exactly 1 ounce and contain ¾ grain free Iodine in each minim.

Dose.—3 to 5 minims for fibrous bronchocele.

A grain of Iodine may be held in solution in a minim of fluid, by employing Sodium Iodide in the proportion of Iodine 3, Sodium Iodide 2, and Water *q.s.* to 3 volumes.

Iodo-Glycerin Solution. **Injectio Iodi, C.L.T.E.** *Morton's Fluid.*

Iodine 10 grains, Potassium Iodide 30 grains, Water 25 minims, dissolve and add Glycerin to 1 ounce.

In spina bifida about 30 minims have been injected into the tumour, also injected into solid goitre.

Iodinoleum, Iodinol.—*Syn.* IODIPIN. 25% and 10%, analagous to Brominol, *q.v.*

Dose.—30 to 45 minims of the 25% = about 10 to 15 grains of Potassium Iodide. Hypodermically 15 minims (1 Cc.) of the 10% preparation.

Soluble in ether, both the 10% and 25% iodinol and chloroform in all proportions, insoluble in alcohol.

An additive compound of Iodine and Sesame Oil, readily absorbed and easily assimilated, prepared similarly to Brominol by repeated iodisation of Sesame Oil by means of Iodine-Monochloride in alcoholic solution. The

preparation is a thick yellow oil. Iodine can be detected in the urine within 10 minutes after a dose.

The 25% is used externally and subcutaneously.

Capsules contain 2 grammes of the 25% = about 9 grains of potassium iodide. (The weaker Iodinol was originally used internally.)

A similar compound with 40% of Iodine has been made with Poppy Seed Oil.—P. J.ii./01,65.

Iodinol may be given in beer, wine, milk, shaken with syrup or emulsified as **Emulsio Iodinol**:—Iodinol 25% 2 ounces, Gum Acacia 1 ounce, Chloroform 12 minims, rub together and add quickly with vigorous agitation Water *q.s.* to 6 ounces. Dose of 2 drachms = about 7 grains potassium iodide.

Iodipin Solidum. *Dose.*—30 grains thrice daily.

An odourless compound containing 40% of the 25% Iodipin, *i.e.*, contains Iodine 10%. Is made with **Roborat** (*see* M. 1900,140), used in bronchial asthma, bronchitis, arteriosclerosis, syphilis. **Tablets** (sugar-coated) of this are also made (M. 1906), and contain 3 grains of the 25% Iodipin, *i.e.*, ¾ grain Iodine.

Iodinol cum Extracto Malti.

Dose.—1 ounce (30 Cc.).

Iodinol 25% 1, Malt Extract (thick) to 4. A palatable method of administration.

Scrofulosis, convulsions of children, tuberculous induration of the larynx, pleuritic induration, facial paralysis, and syphilis have been treated by internal and local use. In actinomycosis markedly good results have been produced by Iodinol and Potassium Iodide, and it has been found useful instilled for eye affections.

Uterine fibroids treated with Iodine injections.—L.i./03,958; B.M.J. ii./04,1085.

Syphilitic disease of the nervous system—treatment by Potassium Iodide or Iodinol and Mercury. The two former can be administered in almost any quantity. Mercury can only be gradually introduced. They are equally useful, but mercury (in the form of oleate *q.v.*) is more powerful where there is inflammation. Potassium Iodide in 40 grain doses, thrice daily, was given as far back as 1847. Iodide or Iodinol should be given after the mercury treatment for 3 or 4 weeks, every 4 or 6 months; for 3 or 4 years.—Gowers; B.M.J. i./03,773.

In osseous tuberculosis Iodine injected with good results. Red blood corpuscles, hæmoglobin and globulin increased.—B.M.J.E.ii./05,28.

Found useful for inunction, also employed hypodermically

in 15 minim doses.—Pr. July, 1904; gonorrhœal rheumatism 10 Gm. doses injected in affected region.—B.M.J.E. ii./04,75.

Injected under the skin in arterio-sclerosis, aneurism, and syphilitic affections. Large doses in angina. In locomotor ataxy 120 grains daily with best results.—L. i./06,1250.

Iodum Oleatum.

An Iodine-Oleic Acid compound containing 10% of Iodine. When thoroughly rubbed into any part does not stain the skin, but is rapidly absorbed, and its specific effect is soon apparent.

Liquor Iodi Oleicus, St. M.'s H. Iodine 1, Potassium Iodide 1, Oleic Acid to 20. A pale yellow liquid which stains the skin slightly on inunction.

Liquor Iodi (B.P. 1885).—*Syn.* LUGOL'S SOLUTION. Iodine 2, Potassium Iodide 3, Water 40.

Liquor Iodi Compositus, U.S. Iodine 5, Potassium Iodide 10, Water to 100.

Liquor Iodi Dilutus, U.C.H. Iodine 22 grains, Potassium Iodide 33 grains, Water to 1 ounce.

Liquor Iodi Fortis, Strong Solution of Iodine (*Off.*).—*Syn.* LINIMENTUM IODI (B.P. 1885).

Iodine 5, Potassium Iodide 3, Distilled Water 5. Dissolve and add Alcohol (90%) 36.

Pigmentum Iodi, U.C.H., Mid.H.

Tincture of Iodine 1, Strong Solution of Iodine 1.

Pigmentum Iodi, St. Th. H., has Iodine 100 grains, Potassium Iodide 100 grains, to water 1 ounce.

Pigmentum Iodi et Aconiti, K.C.H. Tincture of Iodine 1, Tincture of Aconite (Fleming's) 1.

Periodontitis is relieved by Iodine or Iodine and Aconite Pigment.

Pigmentum Iodi Æthereale.

Iodine ½, Alcohol 90% 3, Methylated Ether 2½. Has the advantage of drying rapidly.

Pigmentum Iodi et Olei Picis, Mid. H.

Syn. (as Pasta Iodi et Picis) COSTER'S PASTE.

Iodine 1, Light Oil of Wood Tar 4.

Mix carefully, applying heat if necessary; after ebullition preserve for use. Ebullition generally takes place by the chemical action between the two ingredients, a part of the oil is oxidised and forms a resinous deposit.

Similar, but more irritating, applications are made by combining Iodine with creosote or *huile de cade* in the same proportions as above.

Uses.—For ringworm of the scalp; after well shaking the bottle, it should be well brushed in with a stiff brush; a scab will be produced which should be removed in a few days, the part cleansed by soaking with oil, and then soap and warm water; after drying, more paste should be applied. It seldom causes pain.

Iodine, Chloral Hydrate, and Carbolic Acid, equal parts, have also been recommended for ringworm.

Pigmentum Mandl, T.H.

Iodine 6 grains, Potassium Iodide 20 grains, Oil of Peppermint 5 minims, Glycerin to 1 ounce. Use as a throat stimulant.

Iodised Absorbent Wool 6% supplied in 1 lb. rolls. Is said to have saved life in a case of double pneumonia.

Syrupus Iodo-Tannicus (Martindale).

Dose.—½ to 2 drachms (1·8 to 7·0 Cc.), containing 1 to 4 grains of Iodine, in water or wine.

Iodine 2½ Gm., Tannic Acid 4 Gm., Alcohol 90% 38 Cc., Syrup (with flavourings and carminatives) *q.s.* to 75 Cc.

Dissolve the Iodine in the Alcohol, add the Tannic Acid and 30 Cc. of Syrup, heat until no indication of free Iodine with starch, cool and add the other ingredients.

This contains the Iodine to a great extent in the form of Hydriodic Acid.

Uses.—Of great value for enlarged glands in children and also as a tonic after removal of tonsils and adenoids. And is suggested in lymphæmia, anæmia, dysmenorrhœa and pulmonary affections.

Specially useful in cases of chronic lymphadenitis associated with or independent of adenoids. In atrophic rhinitis has given good results especially when combined with arsenic, and in simple bronchocele supplemented by the external use of Iodine Oleate or **Unguentum Iodi Intinctum** (*q.v.*)—B.M.J.i./04,724; L.i./04,994.

The combination of Iodine and Tannin discussed.—P.J. ii./01,147,173; i./02,193; C.D. ii./04,416; ii./05, 184.

In arterio-sclerosis often more valuable than Iodides or Thyroid preparations.—B.M.J. i./06,126. A formula containing 0·2% of Iodine made with Iodine 2, Tannin

4, Distilled Water 360 and Sugar 640, may find a place in the New Codex.

Ph. Ned. has—Mix Iodine Tincture (1 to 9) 10, Rhatany Extract 4, and add to Warm Water 80. Set aside in closed vessel 24 hours, or warm to 50° for 1 hour or until no iodine reaction is observed. Add Water 100, and dissolve Sugar 310.

Syrupus Tann-Iodo-Phosphoratus.

Dose.—½ to 2 drachms. Contains 5 grains Mono-Calcium Phosphate in 2 drachms of the Syrupus Iodo-Tannicus.—*Martindale.*

Vinum Tann-Iodo-Phosphoratus.

Dose.—½ to 2 ounces (containing 1 to 4 grains of Iodine). Is eight times weaker than the syrup above; is made with Malaga. These two preparations are elaborations of the Syrupus Iodo-Tannicus above, and are suitable as tonics for children and invalids.

Tinctura Iodi (*Off.*). *Dose* (for vomiting).—2 to 5 minims (0·12 to 0·3 Cc.).

Iodine 1, Potassium Iodide 1, Distilled Water 1; dissolve, add Alcohol (90%) *q.s.* to 40. U.S. Iodine 7, Potassium Iodide 5, Alcohol 94·9% vol. to 100.

C.U.D. proposes 10% strength with alcohol 95%. This is more in accord with several foreign pharmacopœias. Small doses are useful in sea-sickness.

Tincture of Iodine is given as a tonic before meals in tuberculosis, *e.g.*, teaspoonful doses of the following:—Iodine Tincture (Codex—Iodine 1, Alcohol 12) 20, Potasssium Iodide 2, Glycerin 40, Syrup of Orange 50, Water to 1,000.

Tinctura Iodinei, P. Ed., 1 grain Iodine to 16 minims of Alcohol 90%. For external use, and is preferred as an injection for hydrocele and for dry inhalation; it is not miscible with water.

Tinctura Iodi Ætherea.

Iodine 1, Pure Ether 40. For skin diseases.

Tinctura Iodi Decolorata, B.P.C.

Iodine 250 grains; Alcohol 90% 5½ ounces. Dissolve with a gentle heat, and add when cold Strong Solution of Ammonia 10 drachms. Keep the mixture in a warm place until decolorised*, after which dilute it with (about 2 to 1 is required) Alcohol 90% *q.s.* to 1 pint.

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* In this concentrated form it may be prescribed as Tinctura Iodi Decolorata Fortior.—B.P.C.

Mix. It forms a useful application for chilblains and for painting on exposed affected parts. Some iodoform is formed in solution.

Tinctura Iodi Oleosa.

Iodine 1, Alcohol (90%) 9; heat to dissolve, and add Castor Oil 2. Repeatedly applied as a pigment, it does not crack the skin, as the tincture does.

Unguentum Iodi (*Off.*).

Iodine 1, Potassium Iodide 1, Glycerin (by weight) 3; dissolve, and add Lard 20. (U.S. Benzoated Lard 80.)

Ph. Ned. has Iodine 2, Potassium Iodide 3, Water 5, Simple Ointment 90.

Unguentum Simplex, Ph. Ned., is Yellow Wax 30, Sesame Oil 70.

Unguentum Iodi Intinctum, Stainless Iodine Ointment, *Martindale*.

Iodine 1, Oleic Acid 4, Soft Paraffin 14, Hard Paraffin 1.

Possesses iodising properties (*c.f.* Iodum Oleatum, the liquid equivalent).

Kelpion is a specialty containing Iodine and is similarly stainless.

Amyli Iodidum. IODIZED STARCH.

Iodine 1, distilled water *q.s.* to moisten. Triturate and add gradually wheat starch in powder 20. Continue the trituration until of uniform colour, and dry below 104°F.

Dose.—½ to 4 drachms (2 to 16 Gm.), in water, water-gruel, or arrowroot with water. As a local application, is said to be as valuable as iodoform.

This is a mild form of administering iodine in very weak combination for syphilis and other diseases; the dose is pushed until free iodine can be detected in the urine. It is recommended as an antidote when poison is unknown, and for sulphuretted hydrogen, the alkaloids, alkaline sulphides, caustic alkalis, and ammonia.

In lupus erythematodes, doses of 1 to 4 teaspoonfuls three times a day have been found very successful.

Pasta Iodi et Amyli, U.C.H.

Starch, in powder, 1, Glycerin 2, Water 6; boil, and when nearly cold add Dilute Solution of Iodine U.C.H. 1. Mix well. Useful to cleanse and heal foul sores, especially such as are syphilitic.—Tilbury Fox. It rapidly heals syphilitic ulcers, especially those of the face; if applied on lint during the night, the sores may be hidden with calamine lotion during the day.

Iodalbacid. *Dose.*—15 grains (1 Gm.).

A brown powder, tasteless and odourless albuminous compound; said to contain 10% of Iodine. Has been given for epilepsy and syphilis; is suitable for prolonged administration.

Acidum Hydriodicum. *Syn.* Acidum Hydriodicum Dilutum, U.S.

Dose.—5 to 10 minims (0·3 to 0·6 Cc.) in syrup.

May be made by interaction of potasssium iodide, potassium hypophosphite and tartaric acid in hydro-alcoholic solution.

A colourless, sour liquid, which becomes dark in colour on exposure to light; it has Sp. Gr. 1·085, and contains about 12% of Hydrogen Iodide. (U.S. contains 10%.) HI=126·9 (*Off.* and U.S. Wts.) (127·978 I. Wts.).

Syrupus Acidi Hydriodici, U.S.

Average dose.—60 minims (well diluted).

Diluted Hydriodic Acid 1, Water 3, Syrup 6. Contains 1% HI.

Glycerinum Acid Hydriodici.

Dose.—20 to 60 minims (1·2 to 3·5 Cc.).

C. D. ii./04,498 gives a method for making a preparation of this kind from potassium iodide (with a little hypophosphite) and tartaric acid, but experiments which we have conducted show that Dilute Hydriodic Acid, U.S., 1, Glycerin $4\frac{1}{3}$ and Water $4\frac{1}{2}$, produce a glycerole with good keeping qualities. Contains 1% hydriodic acid. (The Hydriodic Acid, U.S., already contains a proportion of hypophosphorous acid.)

Gardner's Syrup contains about $1\frac{1}{4}$% of Hydrogen Iodide. *Dose.*—1 to 3 fluid drachms in water.

Vapor Iodi Ætherealis.

Iodine 3 grains, Ether 2 drachms, Carbolic Acid 2 drachms, Creosote 1 drachm, Alcohol 90% 3 drachms. Ten minims to be dropped on the respirator for dry inhalation. Thymol may be substituted for creosote.

Vapor Iodi et Acidi Carbolici Ætherealis R.F.H.

Iodine 3 grains, Ether 2 drachms, Carbolic Acid 2 drachms, Alcohol 90% to 1 ounce.

Ten drops at a time in an inhaler, *e.g.*, the 'Ozonic.'

Iohydrin. *Syn.* JOTHION.

Di-Iodo-Isopropylalcohol. Glycerin Di-Iodohydrin.

$CH_2I.CHOH.CH_2I$=309·41 (311.988 I. Wts.)

Dose.—By inunction ½ to 1 drachm.

A yellowish oily liquid (Sp. Gr. 2·5) prepared by heating *s*-dichlorhydrin with potassium iodide solution. Contains about 80% iodine.

Soluble 1 in 75 of water. Being readily absorbed by the skin is employed for inunction of iodine in inflammatory conditions, scrofula, pulmonary tuberculosis, bronchial asthma, &c. For such purposes should be ordered diluted with almond oil in form of a cream 25% strength or with lanolin same strength.—B.M.J.E. ii./05,23; P.J. ii./05,253. Also for chronic metritis and in after-treatment of contusions, extravasations and scrofulous gland enlargements.

Sajodin. *Dose.*—15 grains (1 Gm.).

The name given to the Calcium Salt of mono-Iodobehenic Acid (Iodo-Sebacic Acid) $(C_{22}H_{42}O_2I)_2Ca$= 963·07 (970·712 I. Wts.). A tasteless powder containing about 26% Iodine and 4% Calcium, ***insoluble*** in water. In syphilis, bronchial asthma, arterio-sclerosis, &c., given as Potassium Iodide.—L. i./06,1254 (in which the formula is wrongly printed).

TO ESTIMATE THE 'IODINE NUMBER' OF A FAT OR OIL.

The Iodine Number indicates the percentage of iodine capable of absorption. Hübl's Iodine Solution is prepared: Dissolve Iodine 25 Gm. in Absolute Alcohol 500 Cc.; dissolve Mercuric Chloride 30 Gm. in a further 500 Cc. of Absolute Alcohol, filter and add to the first solution. Allow to stand 12 hours or so, and ascertain the strength of iodine by a standard sodium thiosulphate solution in the customary manner.

0·8 Gm. of the fat, or 0·3 Gm. of a drying oil, or 0·4 Gm. of a non-drying oil, is accurately weighed out and dissolved in 10 Cc. of chloroform. To the solution in a stoppered vessel 20 Cc. of the Hübl's Solution are added, and if the mixture becomes decolourised on standing a short time a further 10 Cc. of Hübl's Solution are added. Then add 10 to 15 Cc. of Solution of Potassium Iodide B.P. and dilute the whole with 150 Cc. of water. Determine the free iodine with thiosulphate and starch, shaking thoroughly. Conduct a blank experiment with the same quantities of chloroform, iodine, etc., deduct the quantity required in the original experiment from the volume of the thiosulphate solution used in this blank experiment and calculate into the equivalent of iodine—this again is to be calculated into units per cent of the oil.

Example.—0·8 Gm. of a fat required 36–7 Cc. of Thiosulphate Solution = 29 Cc = 0·3651 Gm. Iodine, therefore 100 of the fat combines with $\frac{0{\cdot}3651 \times 100}{0{\cdot}8}$ Iodine = 45·6 the Iodine Number of the fat.

IODINE NUMBERS (*Allen*).

Almond Oil 97·5–98·9
Apricot-kernel Oil 99–102.
Olive Oil 81·6–84·5
Sesame Oil 105–108
Cottonseed Oil 105–108
Linseed (raw) Oil 156-160
Linseed (boiled) Oil 148.
Castor Oil 84·0–84·7
Cod-liver Oil 155 - 170 (Parry, C.D. i./05,492.)
Sperm Oil 84·3
Neatsfoot Oil 66·0
Cacao-butter 34·0
Japan Wax 4·2
Lard 59·0

IPECACUANHA (*Off.*) U.S.

Dose.—As an expectorant, $\frac{1}{4}$ to 2 grains (0·016 to 0·13 Gm.), as an emetic 15 to 30 grains (1 to 2 Gm.).

The dried root of *Psychotria Ipecacuanha* (*Rubiaceæ*) from Rio De Janeiro; another variety is known in commerce as Carthagena Ipecacuanha. It is thicker, the annulations less marked (taking the form of narrow merging ridges) and its starch-grains are somewhat larger; this is less expensive.

Uses of Ipecacuanha.—Expectorant, emetic. Loosens phlegm, *e.g.*, in bronchitis, whooping cough and croup. In small doses is stomachic and increases the flow of bile. When de-emetinised is used in dysentery. Frequent doses, 1 to 2 minims of the Wine of Ipecacuanha sometimes check sickness.

Good reaction of doses of 20 grains in dysentery when acute, in strong persons.—L. ii./98,52; B.M.J. i./98,1056. In acute amœbic dysentery 20 grain dose.—R.A.M.C. Jl. 1905,362.

In anthrax has been employed successfully. The powdered root is dusted on the sores and 5 grain doses given every four hours.

Methods of assaying with results: Brazilian, alkaloidal content about 2·2%, Carthagena about 2·0%.—P.J. i./03,425.

Emetine constitutes 72% of the total alkaloid in the Brazilian root, Cephaëline 26, and Psychotrine the remaining 2%.—Ph.

In the Carthagena the proportions are reversed, namely, an average of 57 of Cephaëline and 40 of Emetine.

Assay and identification of the powdered root.—P.J. ii./03,73,101.

Review of the current methods of estimation. Titration of the residue should be insisted upon.—P.J. ii./05,124.

Colour reactions of the alkaloids similar to those of morphine.—Y.B.P. 1903,96.

C.U.D. suggests the root bark only to be powdered, rejecting the woody portion. The powder should have an alkaloidal strength of 2%. The alkaloidal content does not vary greatly.

U.S. allows both *Cephaëlis Ipecacuanha* (*Rio*) and *C. acuminata* (*Carthagena*) if yielding 2% alkaloids. (Average doses ½ the maximum B.P.)

P. Belg. also requires 2% alkaloids.

U.S. Assay Method.—Shake 15 Gm. of ipecacuanha in No. 80 powder with chloroform, ether and ammonia. A volume of the solution is treated with sulphuric acid, and this solution shaken out with ether in the presence of ammonia. The ether-soluble alkaloid thus obtained is dissolved in $^{N}/_{10}$ sulphuric acid, warming gently if necessary. The acid solution is then back-titrated with alkali, employing the factor 0·0238 to ascertain the percentage of alkaloids. (1 Cc. $^{N}/_{10}$ Acid = 0·02314 Gm. Cephaëline or 0·02453 Gm. Emetine—a mean of 0·0238.)

Tablets of Ipecacuanha Powder contain $\frac{1}{20}$, $\frac{1}{10}$, $\frac{1}{4}$ and 5 grains. **Pills** may be prepared salol-coated for dissolving in intestine only.—P.J. ii./04,580.

Pulvis Ipecacuanhæ sine Emetina (Ipecacuanha from which the emetine has been extracted) acts equally well, it is said, for dysentery, without causing vomiting. A small quantity of opium may be added if desired. *Dose.*—5 to 20 grains (**0·32 to 1·3 Gm.**).—Pr. l. 411; M.C. Aug. 93,338.

Acetum Ipecacuanhæ (*Off.*).

Dose.—5 to 30 minims (**0·3 to 1·8 Cc.**).

Liquid Extract of Ipecacuanha 1, Alcohol (90%) 2, Diluted Acetic Acid *q.s.* to 20. Alkaloids about 0·1%.

Ethyl Acetate may be formed in this preparation, as it is an aceto-alcoholic solution of the active principles. The advisability of employing the acid is questioned.

Acetracts. Acetic extracts of Ipecacuanha, Cinchona, Colchicum Seed and other drugs have been prepared, and have been suggested to replace alcoholic preparations.

The acidity of these preparations is, however, a slight disadvantage, as they would be frequently incompatible.

Extractum Ipecacuanhæ Liquidum (*Off.*).

Dose.—As an expectorant, ½ to 2 minims (**0·03 to 0·12 Cc.**); emetic, 15 to 20 minims (**0·9 to 1·2 Cc.**).

Ipecacuanha in No. 20 powder is percolated with 90% alcohol, and the marc mixed with calcium hydroxide and further percolated; the percolate is finally adjusted in strength to contain 2 to 2·25% of alkaloid. 1 = about 1 of root. Keeps indifferently.

The separation of the total alkaloid into emetine and cephaëline by Paterson's process would exclude the use of Carthagena Ipecacuanha. The cephaëline should not exceed 30% of the total.—B. & C.D. i./05,403.

Five samples gave 1·44 to 1·87% alkaloids. Carthagena contained from 2·07 to 2·31% alkaloids.—P.J.ii./04,475.

Fluidextractum Ipecacuanhæ, U.S. 1=1 by hydro-alcoholic percolation. Standardised to 1·75 Gm. alkaloids in 100 Cc. *Average dose.*—Emetic, 15 minims; expectorant, 1 minim.

Powdered Extract of Ipecacuanha of commerce is stated to contain 10% emetine.

An **Elixir** has been made with Liquid Extract 1, Alcohol 90% 1, Glycerin 5, Water to 20; may be dispensed with alkalis; strength same as Vinum Ipecacuanhæ (*Off.*). *Dose.*—As expectorant, 10 to 30 m.

Linctus Ipecacuanhæ. St. Th. H. has Vinegar of Ipecacuanha, Syrup of Tolu, Glycerin and Mucilage of Tragacanth equal parts. *Dose.*—1 drachm.

Linctus Glycerini, St. M.'s H.

Ipecacuanha Wine 5 minims, Paregoric 15 minims, Glycerin ½ drachm, Water to 1 drachm.

Mistura Ipecacuanhæ Ammoniata, St. M.'s H.

Ipecacuanha Wine 10 minims, Ammonium Carbonate 5 grains, Peppermint Water to 1 ounce.

Mistura Ipecacuanhæ Salina, St. M.'s H.

Ipecacuanha Wine 6 minims, Spirit of Nitrous Ether 20 minims, Paregoric 30 minims, Solution of Ammonium Acetate 1 drachm, Water to 1 ounce.

Pulvis Ipecacuanhæ Compositus.

Syn. DOVER'S POWDER. (*Off.*).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

Ipecacuanha 1, Opium 1, Potassium Sulphate 8. Is diaphoretic and anodyne; 10 grains at bedtime for an acute catarrh or coryza.

Should contain 10% of Pulvis Opii.—C.U.D.

Tablets of Dover's Powder, 5 grains (0·32 Gm.).

Tinctura Ipecacuanhæ et Opii, U.S.

Average dose.—8 mimims (0·5 Cc.). Equal to Opium ¾ grain and Ipecacuanha ¾ grain.

Represents Dover's Powder in liquid form.

U.S. Tincture of Deodorised Opium 10 (evaporated to 8), Fluidextract of Ipecacuanha 1, Alcohol 48·9% by volume to 10.

Pilula Ipecacuanhæ cum Scilla.

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Compound Powder of Ipecacuanha 3, Squill 1, Ammoniacum 1, Syrup of Glucose *q.s.*

Syrupus Ipecacuanhæ Aceticus, B.P.C.

Dose.—¼ to 2 drachms (0·9 to 7 Cc.).

Vinegar of Ipecacuanha 1 pint, Refined Sugar 2½ pounds. Dissolve by gentle heat. Sp. Gr. about 1·33.

Should be 10% of the C.U.D. tincture in syrup.—C.U.D.

Syrupus Ipecacuanhæ, P.G. iv.

Ipecacuanha 1, Alcohol (90%) 5, Water 40. Macerate 48 hours, filter 40, add sugar 60, and dissolve to make 100 of syrup.

U.S. orders Fluidextract 7, Acetic Acid 1, Glycerin 10, Sugar 70, Water to 100.

The Codex Sirop 1907 will probably be 1% intended as an expectorant. That of C.U.D. is intended to produce vomiting.

Tinctura Ipecacuanhæ, P. Belg., 10% prepared by percolation with Alcohol 70%.—As approved by C.U.D.

Vinum Ipecacuanhæ (*Off.*).

Dose.—As an expectorant, 10 to 30 minims (0·6 to 1·8 Cc.); as an emetic, 4 to 6 drachms (15 to 22 Cc.).

Liquid Extract of Ipecacuanha 1, Sherry 19. After 48 hours, filter.

Is better prepared with detannated wine.

Is given in 2 to 3 minim doses to allay the vomiting in pregnancy.

U.S. has Fluidextract 1, Alcohol 1, White Wine 8.

Emetine, Impure.—*Syn.* EMETIA.

A mixture of alkaloids, an amorphous mass, soluble in alcohol and dilute acids. Is a powerful emetic and depressent, and is given in doses of $\frac{1}{100}$ to $\frac{1}{25}$ grain as an expectorant, $\frac{1}{8}$ to $\frac{3}{8}$ grain as an emetic.

The pharmacology of ipecacuanha alkaloids.—L. ii./95, 274; P.J. ii./95,435; L.ii./02,654; B.M.J.E.i/03,83.

Emetina ($C_{15}H_{21}NO_2 = 245·35$ (247·208 I. Wts.) Paul and Cowley), is white and amorphous, sparingly soluble in water, soluble in ether, alcohol, and chloroform, insoluble in caustic alkaline solutions; rapidly darkening in colour on exposure, and forming crystalline salts of which the **Hydrochloride** $C_{15}H_{21}NO_2.HCl = 281·54$ (283·266 I. Wts.) and **Hydrobromide** $C_{15}H_{21}NO_2.HBr = 325·7$ (328·176 I. Wts.) (+Aq.). Contains 75% Emetine (*Dose* $\frac{1}{100}$ to $\frac{1}{25}$ grain [0·00065 to

0 0026 Gm.] as an expectorant) are freely soluble in water.

Of the Hydrochloride 4 grains in 8 ounces of Sherry forms **Vinum Emetinæ** equivalent to Ipecacuanha Wine. *Dose.*—5 to 40 minims (0·3 to 2·4 Cc.).

Cephaëline, $C_{14}H_{19}NO_2$=231·44 (233·192 I. Wts.) Paul & Cowley) is a crystalline alkaloid less soluble in ether than emetine, but soluble in caustic alkaline solutions, and also darkens on exposure.

The expectorant and emetic properties of **Cephaëline** and **Emetine** only result when administered *per os.*

Cephaëline Hydrochloride, $C_{14}H_{19}NO_2$,HCl (Paul & Cowley)=267·63 (269·65 I. Wts.) is the more powerful emetic in doses of $\frac{1}{12}$ to $\frac{1}{6}$ gr. and emetine the best expectorant, but this is emetic in large doses.

Dose.—A solution of **Emetine Hydrobromide** 1 grain to the ounce in 20% alcohol is employed. Of this, for adults 5 to 20 minims as expectorant and depressent, and 1 to 3 drachms as an emetic ($\frac{1}{8}$ to $\frac{3}{8}$ gr.). —M.A. 1904,24.

Emetine and Cephaëline in phthisis, comparative results.—B.M.J.E. i./05,19.

Emetin—Extractive.

Dose.—Expectorant $\frac{1}{15}$ to $\frac{1}{10}$ (0·0043 to 0·0065 Gm.), emetic $\frac{1}{2}$ to 1 grain (0·032 to 0·065 Gm.), in pill or solution. An extractive substance, soluble in water; must be distinguished from Emetine.

Trochisci Ipecacuanhæ.—$\frac{1}{2}$ grain (0·016 Gm.) in each, with Fruit Basis. (*Off.*).

Trochisci Morphinæ et Emetin (Trochisci Tussis) contain $\frac{1}{40}$ grain of Morphine and $\frac{1}{80}$ grain of Emetin in each. Useful in bronchial asthma.

Trochisci Morphinæ $\frac{1}{30}$ grain **et Ipecacuanhæ** $\frac{1}{12}$ grain (0·0054 Gm.) in each, with Tolu Basis.

Emetin is an emetic by reflex action, reduces the respiration and circulation, and it combats the convulsions caused by strychnine. Its action seems to be limited to the peripheric extremities of the vagus nerve.

Unguentum Ipecacuanhæ et Crotonis.—Sawyer.

Pulvis Ipecacuanhæ 4 drachms, Linimentum Crotonis 4 drachms, Adeps Benzoatus 1 ounce. A powerful counter-irritant, rubbed on skin of epigastrium relieves gastralgia.

IRIDIN. B.P.C.

Dose.—1 to 3 grains (0·065 to 0·32 Gm.), in a pill with tragacanth or with extract of henbane.

The powdered extract of a dark brown colour obtained by means of Alcohol 60% from the root of the blue flag, *Iris versicolor*, has a bitter, acrid taste, possesses cathartic, alterative, and diuretic properties, given in hepatic and intestinal disorders.

Extractum Iridis and Liquid Extract were contained in U.S. 1890, but were omitted in 1900.

Pilula Iridin.—Iridin 2 grains, Extract of Henbane *q.s.*, or with one grain of Euonymin; for biliousness.

Cholelithiasis successfully treated by 9 grain doses of iridin with urotropin.—B.M.J. i./06,264.

JABORANDI FOLIA (*Off.*). P. Austr. Pilocarpus, U.S.

Dose.—5 to 60 grains (0·32 to 4 Gm.)of the powder.

Average dose.—U.S. 30 grains.

The dried leaflets of a shrub, diagnosed by E. M. Holmes as *Pilocarpus Jaborandi* (*Rutaceæ*), imported from Brazil, principally from Pernambuco. The leaflets of *P. Selloanus* are also imported from Rio de Janeiro under the same name, but are much less active. Jaborandi was introduced into Britain by the late W. Martindale.

Assay.—U.S. method: Percolate 10 Gm. of the drug in No. 60 powder with ammoniated chloroform. Shake the chloroformic solution of the alkaloids with sulphuric acid twice, and finally with water. The combined acid liquor is evaporated and the residue dissolved in a volume of N/10 sulphuric acid, and excess of acid titrated with N/50 potash. The figure 0·2 is employed as representing the weight in centigrammes of the alkaloids (mainly pilocarpine) neutralising 1 Cc. of N/10 sulphuric acid.

Method of determination.—P.J. ii./05,123, 580.

P. Selloanus and *P. Microphyllus* are the leaves of commerce.—P.J. i./00,8; or the latter only.—P.J. i./04,54; another variety is *P. trachylophus*.

Holmes suggests that *P. Microphyllus* should be substituted for *P. Jaborandi* in the next B.P.—P.J. i./04,891.

U.S. also allows leaflets of *P. Microphyllus* yielding not less than 0·5% alkaloids.

Uses.—True Jaborandi is a powerful sudorific galactogogue and sialogogue; after a time a large dose

acts as an emetic, contracts the pupil of the eye, and causes the approximation of vision. These properties are principally due to an alkaloid **Pilocarpine** contained in it. For other constituents, *v.p.* 451.

Has been used in a great variety of diseases, most successfully in asthma, diabetes, dropsy and uræmia and as an antidote to belladonna poisoning. Children proportionately are not affected by the drug so much as adults. Externally promotes growth of the hair.

Description and physiological action (on the writer).—P.J. 1874,364. The best samples contain ½ to 1% of pilocarpine; of late inferior sorts have not yielded above $\frac{1}{10}$ %.

Antidotes to Jaborandi and its preparations:—

After evacuating the stomach, give Tannic or Gallic Acid, then Atropine Sulphate or Tincture of Belladonna.

Extractum Jaborandi (Hydro-Alcoholic). B.P.'85.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.), in pills.

Powdered Extract of Jaborandi of commerce contains 3·75% pilocarpine.

Extractum Jaborandi Liquidum (*Off.*), **Liquor Jaborandi.** 1=1 of leaves; in 45% Alcohol.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Fluidextractum Pilocarpi, U.S. 1 = 1 of leaves by diluted Alcohol. Standardised to 0·4% Alkaloids.

Average dose.—30 minims.

Tinctura Jaborandi (*Off.*). 1 in 5 of 45% Alcohol.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

The sweating and salivation from a full dose of Jaborandi or Pilocarpine persist from 2 to 4 or 5 hours, the symptoms come on in about 10 minutes after taking the dose if external conditions are favourable. Hypodermically the alkaloid acts in 3 to 5 minutes. A reduction of temperature on an average of 0·9° occurs under the influence of the drug.

Pilocarpina, $C_{11}H_{16}O_2N_2$=206·65 (208·208 I. Wts.).

The pure alkaloid is a colourless syrupy liquid, optically inactive, obtainable crystalline with great difficulty.

Pilocarpinum Hydrochloricum, P.G.iv., U.S.

$C_{11}H_{16}O_2N_2.HCl$ = 242·84 (242·81 U.S. Wts.; 244·666 I. Wts.).

Dose.—$\frac{1}{20}$ to ⅓ grain (0·0032 to 0·02 Gm.) by

mouth or $\frac{1}{10}$ to $\frac{1}{3}$ grain (0·0065 to 0·02 Gm.) hypodermically. In minute granular snow-white crystals, slightly deliquescent and very soluble in water. Melts at 204–205°C.—J. C. S. 1900,477. That in U.S. melts at 195·9° C.

In pneumonia 20 drops of 1% solution on sugar or in water have been given.

Hypodermic Tablets contain $\frac{1}{6}$ grain.

Pilocarpinæ Nitras, (*Off.*) U.S.

$C_{11}H_{16}O_2N_2.HNO_3 = 269·23$ (269·20 U.S. Wts.; 271·256 I. Wts.).

Dose.—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

In minute white granular snow-like crystals, but may be obtained in large white prismatic crystals. ***Soluble*** 1 in 8·2 of water, but very slightly in cold alcohol. This salt, preferred in England, was the first pure preparation of Pilocarpine prepared, and obtained by the late W. Martindale from an alcoholic solution.

It is principally now obtained from *Pilocarpus Microphyllus* (Maranham Jaborandi).—P J. i./04,54.

Pure Pilocarpine Nitrate melts at 177–178° C.; a 2% aqueous solution rotates $[a]_D = +82·2°$ C.; Isopilocarpine Nitrate melts at 159°C., its solution rotates $[a]_D = +38·5°$ C. Jowett. — P.J. i./97,466; i./04,54. That in U.S. melts at 170·9° C.

Jowett states that **Isopilocarpine** (a syrupy liquid) is an isomeride and conversion product of Pilocarpine. J.C.S.T., 1900,473. Pilocarpine cannot be converted into Pilocarpidine and Jaborine, a supposed fourth alkaloid, by chemical agents—the alkaloid Pilocarpine together with small quantities of Pilocarpidine, $C_{10}H_{14}O_2N_2 = 192·74$ (194·192 I. Wts.) (found in Pernambuco Jaborandi only) and Isopilocarpine constitute the 0·5 to 1 % of amorphous alkaloid in the leaves. — J. C. S. T., 1900,**77**,473; 1901,**79**, 580,1331; 1903,**83**,438; Y.B.P. 1899, 435.

Isopilocarpine possesses considerably less salivating and sudorific action than Pilocarpine.—B.M.J. ii./00, 1074; P.J. ii./00,464; i./04,54,827.

Jowett determines that Pilocarpine Solution with a molecular proportion of alkali becomes physiologically inert.—C. D. i./06,293.

Guttæ Pilocarpinæ Nitratis, 0·5 in 100, **R.O.H.**

Used to contract the pupil of the eye.

'**Sterules**' of Pilocarpine Nitrate Solution 2 grains to the ounce of water are prepared.

Injectio Pilocarpinæ Nitratis Hypodermica R.O.H. and T.H. *Dose.*—2 to 6 minims.

Pilocarpine Nitrate 1, Distilled water 20.

G. H. has 1 grain in 12 minims, with following directions:—"To prepare the patient for the injection remove the night-shirt, wrap him closely in a warm blanket, and cover him with two more blankets. Put hot water bottles to his feet, and give him hot drinks freely. After the sweating has ceased, remove the blankets gradually, dry the skin thoroughly, and leave him between warm dry blankets."

Tablets to be given *per os* contain $\frac{1}{10}$ and $\frac{1}{5}$ grain.

Hypodermic Tablets, $\frac{1}{10}$, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ grain (0·0065, 0·008, 0·01, 0·016, 0·02 and 0·032 Gm.).

Ophthalmic discs $\frac{1}{500}$ grain, combined with gelatin.

Lotio Pilocarpinæ, for the hair.

Pilocarpine Nitrate 2 grains, Quinine Hydrochloride 8 grains, Glycerin 2 drachms, Rose Water 6 drachms. Applied locally, and used internally or hypodermically, Pilocarpine seems to have an action in promoting the growth of hair in alopecia. Used also in **Ointment**, 4 grains to the ounce of a mixture of wool fat and soft paraffin ointment.

Pilula Pilocarpinæ Nitratis.

Pilocarpine Nitrate $\frac{1}{20}$ grain (0·0032 Gm.).

Pilocarpinæ Phenas.

$C_{11}H_{16}N_2O_2.C_6H_5OH$=299·99 (302·256 I. Wts.).

A colourless oily liquid, soluble in water and alcohol. In tuberculosis and in malaria 4 Cc. of a 0·02% solution have been injected subcutaneously.

Pilocarpinæ Salicylas.

$C_{11}H_{16}N_2O_2.C_6H_4.OH.COOH$ = 343·66 (346·256 I. Wts.). *Dose.*—$\frac{1}{20}$ to $\frac{1}{2}$ grain (0·0032 to 0·032 Gm.).

In small colourless tabular crystals or white crystalline powder, with bitter taste, easily soluble in water.

Bromocarpin. *Syn.* SYRUPUS PILOCARPINÆ ET POTASSII BROMIDI.

Dose.—For children 3 to 7 years of age 1 to 3 drachms daily; 7 to 15 years 1 to 6 drachms daily;

adults ½ to 1 ounce daily, *all spread over the day*. To be taken before meals.

Potassium Bromide 10, Pilocarpine Hydrobromide 0·005, Orange Syrup and Glycerin *q.s.* to 100.

This preparation is employed as a sedative in epilepsy and nervous affections.

The salts of pilocarpine possess all the before-mentioned properties of jaborandi in a marked degree; applied topically, they contract the pupil of the eye. Pilocarpine is antagonistic to atropine, and a complete **antidote** to poisoning by it and by morphine. It promotes the growth of the hair in alopecia. Large doses are powerfully diaphoretic, small ones ($\frac{1}{20}$ grain) check night sweating of phthisis—does not over-dry the skin.

Puerperal convulsions treated by injection of Pilocarpine, pains became stronger, fœtus expelled, and rapid recovery.—B.M.J. i./81,511; L. ii./86,1019.

In deafness useful.—L. ii./93,956; B.M.J. i./93,407.

Relieves itching of jaundice and assists passage of gallstones.—Pr. xlii, 210; B.M.J. i./89,119; L. i./89, 157. Useful in uræmia, $\frac{1}{8}$ grain doses to induce profuse diaphoresis.—B.M.J. ii./90,391; Pr. xlv., 464.

Pneumonia treated by hypodermic injections of $\frac{1}{10}$ grain and more.—L. ii./03,342,424.

Case of uræmic puerperal eclampsia cured by pilocarpine.—B.M.J. ii./90,748.

In Bright's disease to cause sweating.—L.ii./03,342; i./06,598.

Its action on the heart.—B.M.J. ii./04,740.

As sialogogne. Requires care in administering.—i./06,903.

JALAPA (*Off.*).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.). The dried tubercules of *Ipomœa Purga, U. S. Exogonium Purga*, (*Convolvulaceæ*).

Uses.—A powerful purgative producing watery stools, is apt to gripe; must be avoided if the bowels are inflamed. Used to reduce the dropsy of Bright's disease, and to relieve uræmia.

Extractum Jalapæ (*Off.*) Hydro-alcoholic.

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Powdered Jalap Extract of commerce contains 40% resin.

Jalapæ Resina (*Off.*) P.G. and U.S.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

This contains Mayer's two glucosidal resins, about 90% **Convolvulin**, $C_{31}H_{50}O_{16} = 673{\cdot}29$ (678·4 I. Wts.), soluble in alcohol and insoluble in ether, with his Jalapin $C_{34}H_{56}O_{16} = 715{\cdot}02$ (720·448 I. Wts.), about 10% (**Orizabin** of Flückiger), soluble in ether and in alcohol. The latter, the principal constituent of spurious Jalap (*Ipomœa simulans* and *I. orizabensis*), is identical with **Scammonin** (*dose*, 1 to 5 grains) from scammony root, *Convolvulus Scammonia* (*Convolvulaceæ*), *v.p.*647.

The average yield of resin from **Jalap Root** is 8%.

The B.P. requires 9 to 11—rather high.—P.J.i ./04,5.

U.S. requires at least 8% alcohol-soluble resin and not more than 1·5% ether-soluble resin. ***Assay*** (U.S.).—The evaporated ether percolate of the drug in No. 60 powder gives the ether-soluble portion. The marc is then again percolated with alcohol, and a volume of this percolate is shaken with an equal volume of chloroform and of water. The chloroform solution evaporated gives the percentage of resin insoluble in ether, which added to the first figure gives total resin.

The ether test for scammony was devised to detect the adulteration with jalap. Scammony resin of commerce is obtained from the roots and not from the gum resin. American scammony (*Ipomœa orizabensis*) is used as the source of the resin.—P.J. ii./05,583.

Jalapin of British makers (*dose*, 1 to 5 grains) consists principally of Convolvulin and the best is about 90%, soluble in alcohol, in whitish amorphous powder (the Jalapurgin of Maisch and Flückiger), obtained from true Jalap; unfortunately Mayer's **Jalapin** (**Orizabin**, *dose*, 2 to 6 grains), being cheaper, has tended to replace it, but is a less active purgative. The official resin is said to be more active than either.—P.J. 1892, 1079,20,86.

Sapo Jalapinus, P.G. *Dose.*—2 to 6 grains (0·13 to 0·4 Gm.). Jalap Resin 4, Medicinal Soap 4, Alcohol 8. Dissolve and evaporate to 9.

Pilula Jalapæ, P.G. Jalap Soap 3, Jalap 1. In pills of 0·1 Gm. each (1½ grains). *Dose.*—1 to 3.

Pulvis Jalapæ Compositus (*Off.*).

Dose.—20 to 60 grains (1·3 to 4 Gm.).

Jalap 5, Acid Potassium Tartrate 9, Ginger 1.

Tinctura Jalapæ (*Off.*). *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.). About 1 in 5 of Alcohol (70%). Standardised to contain 1·5% of Resin.

Tinctura Jalapæ Composita, I.C.Add., *v.p.*xxviii.

Dose.—30 to 60 minims (1·8 to 3·5 Cc.)

Jalap 8, Scammony 2, Turpeth Root 1, percolate with Alcohol (60%) *q.s.* to 100.

JAMBUL.

Dose, in cachets, 5 to 30 grains (0·32 to 2 Gm.).

The seeds of *Eugenia Jambolana* (*Syzygium Jambolanum*), also known in India as **Jamun**, have been used in diabetes; contain a glucoside Antimellin.

Extractum Jambul Liquidum. 1 = 1 of seeds.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

It is said to be contained in Diabene.—B.M.J. i./04, 708; and in Djocat. Mash 200 Gm. fresh Jambul fruit and seeds with 2 litres of water. Keep warm, and give 100 Cc. night and morning. This quantity lasts 10 days.—B.M.J.E. ii./04,36.

Acted almost specifically in reducing amount of sugar present; combined with meat diet.—B.M.J.E.i./92,39.

Valuable even in advanced diabetes.—B.M.J.ii./01,618.

Cortex Syzygii is official in **Ph. Ned.**

KAOLINUM.

Kaolin (*Off.*) **U.S.** **Bolus Alba, P.G., P. Jap.**

Native white aluminium silicate, $H_2Al_2Si_2O_8 + H_2O$ = 259·032 I. Wts., purified by elutriation from sandy matter; it is a pearly white powder. A useful absorbent powder for irritation of the skin. Cimolite is a special preparation, agreeably perfumed. Kaolin is unacted upon by most chemicals, hence used for making pills of Silver Nitrate, Gold Chloride, and Potassium Permanganate (*see* Unguentum Kaolini). It is useful for sprinkling on to the filter paper in clarifying liquids. According to **U.S.** it should leave not less than 85% non-volatile residue on ignition. Is also tested for iron.

Unguentum Kaolini.

Soft Paraffin 1, Hard Paraffin 1; melt, add Kaolin 1,

and stir till cold. Spread on rag to apply to abraded skin, it allays irritation. Also as excipient pill, *v.* above.

Caspari mentions the use of Anhydrous Sodium Sulphate 30 grains, with Kaolin 60 grains, and water 40 minims as a pill mass.

Unguentum Kaolini Compositum, St. M.'s H.

Kaolin, Liquid Paraffin, Starch, Soft Paraffin (white) of each 1 ounce, add Mercuric Ammonium Chloride 20 grains, Glycerin of Lead Subacetate 1 drachm, Solution of Tar 1 drachm.

Glycerinum Kaolini Aceticum.—Unna.

Glycerin 3, Kaolin 4, Acetic Acid 2 (shake before use). For extracting comedones use night and morning—they are then easily squeezed out.

Dusting Powders.

Dimatos. A light siliceous earth.—P.J. ii./96,xl.

Emol. A siliceous product containing alumina, lime and steatite. Softens horny epidermis, relieves itching, and is a good dusting powder.

Fuller's Earth (China clay) is a native aluminium silicate, with traces of iron and magnesia, brownish in colour when in powder. It is alleged that tetanus has followed its use on infants' sore buttocks.—W.W.W.

Talc, U.S., a native foliaceous magnesium silicate; that from the Tyrol—Venetian Talc—is soft and unctuous.

Talcum Purificatum, U.S., is the above purified by hydrochloric acid.

French Chalk, a harder silicate of magnesium.

Kieselguhr, a diatomaceous earth, known as white peat; burnt produces a light absorbent powder.

Oxide of Zinc, various **Starches,** powdered **Orris Root,** and mixtures of these, perfumed, are employed for toilet purposes; also **Zinc and Starch; Boric Acid and Starch; Boric Acid, Zinc and Starch Powder.**

Calamina Præparata, B.P. 1885.

Syn. Lapis Calaminaris Præparatus.

Impure zinc oxide prepared by calcining native Calamine (zinc carbonate) and reducing it to an impalpable powder. Genuine Calamine is useful as a dusting powder, and for making lotions, and may be mixed with Carmine Triturate to produce the desired tint.

Ceratum Calaminæ, P.L. *Syn.* TURNER'S CERATE.

Calamine and Yellow Wax, of each 15, Olive Oil 40. A useful application to burns.

Linimentum Calaminæ, G.H.

Rub prepared Calamine 20 grains, Zinc Oxide 15 grains (and other powders, if ordered) with Solution of Lime 2 drachms and Water 2 drachms, then incorporate Olive Oil to 1 ounce.

Linimentum Calaminæ, U.C.H.

Levigated Calamine 40 grains, Zinc Oxide 20 grains, Zinc Oleate 10 grains, Wool Fat 10 grains, Soft Paraffin 1½ drachms, Liquid Paraffin to 1 ounce.

Lotio Calaminæ, U.C.H.

Levigated Calamine 40 grains, Zinc Oxide 20 grains, Glycerin 20 minims, Water (or Rose Water) to 1 ounce. Elutriate the calamine and zinc oxide by triturating them in a mortar with successive portions of the water and decanting from the siliceous matter, and add the glycerin. Used in eczema, especially where the surface is red and tender, also to conceal acne spots on the face. One grain of mercuric chloride may be added to 6 ounces.

Lotio Calaminæ Oleosa, St. M.'s H.

Calamine 40 grains, Zinc Oxide 20 grains, Lime Water 3 drachms, Olive Oil 1 ounce.

Lotio pro Acne, N.H.W.

Calamine ½ ounce, Zinc Oxide 2 drachms, Glycerin 2 drachms, Solution of Mercuric Chloride 2 ounces, Water to 8 ounces.

Unguentum Calaminæ, B.P. 1885.

Prepared Calamine 1, Benzoated Lard 5.

KINO (*Off.*) U.S.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

The juice obtained from the trunk of *Pterocarpus Marsupium* (*Leguminosæ*) evaporated to dryness. Dark reddish-brown fragments or powder. Odourless, bitter, and astringent. Partially soluble in water, almost entirely in alcohol 90%, nearly insoluble in ether.

Uses.—Powerfully astringent for diarrhœa, and as **Trochisci** for relaxed condition of the throat. Its powder is also insufflated to check epistaxis.

Tinctura Kino (*Off.*).—1 in 10 of a mixture of Glycerin, Alcohol, and Water. U.S. 1 in 20 with Glycerin 3 in 20. *Dose.*—30 to 60 minims.

This is prone to gelatinise, due to an enzyme in the drug. **A stable tincture** may be made by adding Kino 2 to Boiling Water 10, and keeping the mixture at 100° C. 12 hours. After cooling, Alcohol 10 is added, the tincture set aside 12 hours and filtered. The enzyme is said to withstand a temperature of 90° C. Kino is a cheap source of Tannin.—P.J. ii./03,702.

Incompatible with mineral acids and alkalis and with substances precipitable by the tannin it contains.

KRAMERIÆ RADIX.

Rhatany Root (*Off.*).

The dried root of *Krameria argentea* (Para), and *Krameria triandra* (Peruvian). U.S. includes also Savanilla Rhatany, *i.e.* from *K. Ixina* (*Polygalaceæ*). Is much used for its astringent properties (*vide* Trochisci). Both contain about 8% of a tannin.

Uses.—Similar to the use of tannin, *e.g.*, in tooth powders when teeth are liable to bleed, in relaxed throat, bleeding from nose and bowels, also for diarrhœa.

Extractum Krameriæ (*Off.*) and U.S. *Dose*—5 to 15 grains (0·32 to 1 Gm.). An aqueous extract of the root.

Fluidextractum Krameriæ, U.S.

Average dose.—15 minims. Strength 1=1 by diluted alcohol. Of deep red colour and astringent taste.

Syrupus Krameriæ, U.S. *Average dose.*—1 drachm. Fluidextract of Krameria 45, Syrup to 100.

Suppositorium Krameriæ. 8 grains of Krameria Extract in each, with Cacao Butter basis. May contain in addition Morphine Hydrochloride $\frac{1}{10}$ grain.

Tinctura Krameriæ (*Off.*). 1 in 5 of 60% alcohol by percolation process. *Dose.*—30 to 60 minims (1·8 to 3·5 Cc.). Should not contain less than 5% of extractive.—Umney.

U.S. 1 in 5 of alcohol 48·9% by volume.

Trochisci Krameriæ (*Off.*) are of fruit basis, and contain 1 grain of Extract; are also combined with Cocaine Hydrochloride $\frac{1}{20}$ grain (*Off.*).

Krameria Wool, T.H. 1881. 1 lb. rolls.

LECITHIN, OVO-LECITHIN.

$C_{42}H_{84}NPO_9$ (?) = 771·88 (777·712 I. Wts.).

Choline Di-Stearo-Glycerophosphate.

Dose.—Internally 3 to 5 grains (**0·2 to 0·3 Gm.**) per diem. Subcutaneously ¾ to 2 grains (**0·05 to 0·13 Gm.**) in sterile olive oil, every second day.

A yellowish wax-like mass, insoluble in water, soluble in 1 in 5 of ether, twice its weight of chloroform, and 1 in 30 of alcohol 90%. This compound is a constituent of the brain and of yolk of egg; is used where the phosphates excreted by the urine are high. Given in neurasthenia, various nervous diseases, diabetes, tuberculosis, tabes and general paralysis; also in all diseases producing a disturbance of nutrition. It is said to cause a marked increase in patients' weight, and to improve the general well-being; augments the blood corpuscles. Rickets and marasmus have been successfully treated with lecithin, and intramuscular injections of Sterile Oil Solution have also given relief. Use suggested in incipient tuberculosis, osteomalacia, and the like.

Lecithin should be entirely soluble in chloroform indicating absence of added mineral phosphates. The total phosphorus should be estimated.—Y.B.P. 1903.

Injection (ampullæ). *Dose*—1 Cc., equivalent to ¾ grain (**0·05 Gm.**) of Ovo-lecithin.

Tablets ⅓ grain (**0·025 Gm.**). Pills and granules are also prepared.

Is contained in **Pilula Potentin Composita**, *q.v.*

Lecitogen. *Dose.*—3 to 4 drachms. Cocoa combination containing 1% Lecithin, 22% nitrogenous material, 25% fat, 8% starch.—B.M.J.E. ii./05,100.

LIQUORES CONCENTRATI.

This class of preparations introduced into the British Pharmacopœia was intended to take the place of commercial concentrated decoctions and infusions. One volume diluted with nine of water give the corresponding infusions and decoctions. Commercially the strength is 1 to 7.

Those of **Chiretta, Cusparia, Krameria, Quassia, Rhubarb,** and **Serpentary** are prepared by percolation with 20% alcohol; that of

Senega with slightly stronger alcohol. They are of the uniform strength of 1 in 2, except Quassia (1 in 10), and the *dose* of each is ½ to 1 drachm (1·8 to 3·5 Cc.).

Liquor Calumbæ Concentratus (*Off.*), 1 in 2, is prepared by double maceration with cold water, heating to 180° F., and adding Alcohol (90%) 4½ parts in 20. *Dose.*—½ to 1 drachm.

Liquor Sarsæ Compositus Concentratus (*Off.*) Sarsaparilla 20, Sassafras 2, Guaiacum 2, Liquorice 2, and Mezereon 1, are digested in three successive portions of water at 160° F., concentrated, and Alcohol (90%) 4½ added, to produce 20. *Dose.*—2 to 8 drachms (7 to 30 Cc.). *Vide also* Sarsaparilla.

Sarsaparilla preparations combined with Iodides are sold as "Blood Purifiers."

Liquor Sennæ Concentratus (*Off.*) is prepared by repercolation, with water as a menstruum, heating the product to 180°F., and preserving with Alcohol and Tincture of Ginger. Strength 1 in 1. *Dose.*—½ to 1 drachm (7 to 30 Cc.).

LITHIUM.

Li = 6·97 (7·03 I. Wts.).

Lithium Salts have long had a reputation for assisting in the elimination of Uric Acid, but doubts are now felt on the subject. They should be given freely diluted.

Lithii Benzoas, U.S. $C_6H_5COO\,Li$ = 127·10 (127·11 U.S.) (128·07 I. Wts.).

Dose.—2 to 10 grains (0·13 to 0·65 Gm.) or more.

Usually a light white crystalline powder, soluble about 1 in 4 of water, about 1 in 12 Alcohol 90% ; contains about 95% of Benzoic Acid, and generally a proportion of free Benzoic Acid, upon the amount of which the solubility depends. Used as an antilithic.

Lithii Bromidum, U.S.

Li Br. = 86·32 (86·34 U.S.) (86·99 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

A white granular salt, very deliquescent, odourless, having a sharp, somewhat bitter taste and neutral reaction ; very soluble in water and alcohol.

Contains 91% Bromine as against 67% in Potassium Bromide, hence effect greater, especially as a hypnotic,

and in epilepsy. Of great use in Bright's disease.—L. ii./95,685.

Lithii Carbonas (*Off.*)

Li_2CO_3 = 73·49 (73·51 U.S.) (74·06 I. Wts.)

Dose.—2 to 5 grains (**0·13 to 0·32 Gm.**). Slightly soluble in water (1 in 70).

Tablets, 5 grains (**0·32 Gm.**).

Lithii Citras (*Off.*) $C_3H_4OH(COO\,Li)_3.4H_2O$ = 280·05 (280·08 U.S.) (282·194 I. Wts.)

Dose.—5 to 10 grains (**0·32 to 0·65 Gm.**).

White crystalline powder. Diuretic. ***Soluble*** 1 in 2 of water, and almost insoluble in 90% alcohol.

Dott finds 27% moisture in place of B.P. 19%. Suggests formula with $9H_2O$.—C.D. i./05,489.

Tablets, 5 grains (**0·32 Gm.**).

Effervescent Lithium Citrate (*Off.*) **U.S.**

Dose.—1 or 2 drachms (4 to 8 Gm.). Contains 1 in 20.

'Vescettes' of Lithia, each containing 3 and 5 grains Lithium Citrate.

Lithii Glycerophosphas, *v.p.* 48.

Lithii Guaiacas, Lithium Guaiacate.

Dose.—5 grains (**0·32 Gm.**) in pill twice a day.

Prepared by digesting guaiacum resin in solution of lithium oxide, decanting the clear solution, evaporating, and scaling it. Contains Lithium Oxide 1, Guaiacum Resin 3. Given for chronic gout and rheumatism.

Pilula Lithii Guaiacatis, 5 grains.

Lithii Hippuras, Lithium Hippurate.

$CH_2 < \begin{matrix} NH.\,C_7H_5O \\ COO.\,Li \end{matrix}$ = 183·74 (185·134 I. Wts.).

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**).

In light white minute crystals, soluble in water 1 in $2\frac{1}{2}$, is a powerful solvent of lithates; useful in gout and rheumatism. **Vescettes** contain 5 grains. **Effervescent** Salt 5 grains in 1 drachm.

Lithii Iodidum Li I = 132·87 (134·0 I. Wts.).

Dose.—1 to 5 grains (**0·065 to 0·32 Gm.**).

White crystalline deliquescent powder. A salt rich in iodine,—containing 94·7%. An antiarthritic and has been employed in syphilis by kataphoresis, *q.v.*

Lithii Salicylas, U.S., P.G.iv. $C_6H_4OH.COO\,Li$ = 142·98 (142·99 U.S. Wts.; 144·07 I. Wts.).

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**) for

rheumatism and gout. A deliquescent white powder ***soluble*** 1 in 1 of water.

Effervescent Lithium Salicylate contains 1 in 30

Dose—1 or 2 drachms.

Lithii Tartras Acidus.

CHOH. COOLi. CHOH. COOH + $1\frac{1}{2}$ H_2O = 181·71 (183·094 I. Wts.).

Dose.—5 to 20 grains (**0·32 to 1·3 Gm.**).

A finely crystalline white powder, of special use in gouty cases with gum affections.—L. i./94,1614.

Lithion is a granulated (non-effervescent) preparation composed of lithium citrate, magnesium sulphate, sodium sulphate, &c. *Dose.*—One half to one teaspoonful taken in a little warm water.

Thialion is a laxative Lithia Compound.

Uricedin. A German specialty.

Dose.—1 to 2 drachms (**4 to 8 Gm.**).

In brownish-yellow granules, soluble in water, containing lithium and sodium citrates with sodium sulphate.

Tablets of 15 grains (**1·0 Gm.**).

LUPULINUM (*Off.*).

Dose.—2 to 5 grains (**0·13 to 0·32 Gm.**) in pill, with glycerin and spirit.

The bright yellowish glandular powder — lupulinic glands—separated from the strobiles of the hop—*Humulus Lupulus* (*Moraceæ*). It is aromatic and bitter, and contains the properties of the hop—the resin and volatile oil.– Naylor, P.J., July 28,06. It is used in insomnia and for alcoholism. Inhalation 30 grains to a pint of warm water.

Oleoresina Lupulini, U.S.

Average dose.— 3 grains (**0·2 Gm.**). Is made by acetone extraction.

Tinctura Lupulinæ, U.S., 1870. 1 in 8 S.V.R.

Dose.—10 to 60 minims (**0·6 to 3·5 Cc.**).

Tinctura Lupuli (*Off.*) *Dose.*—$\frac{1}{2}$ to 1 drachm (**1·8 to 3·5 Cc.**). The dried strobiles 1 in 5 Alcohol (60%). A much more aromatic preparation is made from fresh hops.

The extractive varies greatly. A standard of 4% for the tincture has been suggested.

Hop Pillows used to induce sleep are prepared, and it has been suggested that **smoking** the dried strobiles has a somniferous effect.

Fluidextractum Lupulini, U.S.

Syn. **Extractum Humuli Fluidum.**

Average dose.—8 minims. An alcoholic extract, 1 = 1.

Solid Extract by concentration. *Dose.*—2 to 6 gr.

LYCOPODIUM.

Clubmoss Spores.

The spores of *Lycopodium clavatum* (*Lycopodiaceæ*) form a fine, yellow powder. It forms a good pill powder, protecting hygroscopic pills, is useful as a diluent for insufflations for the throat and ear, and as an inert dusting powder for excoriated and weeping surfaces of the skin. When ignited, it explodes with a flicker.

Tinctura Lycopodii. *Dose.*—15 minims to 1 drachm (0·9 to 3·5 Cc.). Lycopodium, first soaked in ether and dried, 1, Alcohol (90%) 10.

Has been given in cases of frequent micturition, and irritation or spasm of the bladder.

MAGNESIUM.

Mg = 24·18 (24·36 I. Wts.)

The metal magnesium is largely used for burning to produce a white light for photographic purposes.

Magnesii Carbonas Levis (*Off.*) 3 ($MgCO_3$), Mg ($HO)_2$, $4H_2O$ = 380·65 (383·52 I. Wts.). Is prepared by precipitation of Magnesium Sulphate Solution with Sodium Carbonate. **Magnesii Carbonas Ponderosus,** similarly in more concentrated solution and with evaporation to dryness. *Dose.*—5 to 30 grains repeated, or 30 to 60 grains as a single administration.

Liquor Magnesii Carbonatis (*Off.*) Fluid Magnesia. *Dose.*—1 to 2 ounces (30 to 60 Cc.)

A colourless liquid, containing 10 grains of Magnesium Carbonate in 1 ounce of Carbonic Acid water.

Magnesia Levis and Magnesia Ponderosa, Mg O = 40·06 (40·36 I. Wts.) are prepared from the respective carbonates by exposure to a dull red heat. *Doses* as for carbonates. Antacid, antilithic, diuretic, laxative.

Magnesii Citras Verus.

Dose.—30 to 120 grains (2 to 8 Gm.).

White crystalline powder or in scale form, soluble in water about 1 in 17. A mild purgative.

Liquor Magnesii Citratis, U.S.

Average daily dose.—12 ounces.

Magnesium Carbonate 15, Citric Acid 33, Syrup of Citric Acid 60, Potassium Bicarbonate 2·5, Water *q.s.* to nearly 360.

Syrupus Acidi Citrici, U.S.

Citric Acid 1, Water 1, Tincture of Fresh Lemon Peel 1, Syrup to 100.

Magnesii Chloridum, $MgCl_2, 6H_2O$ = 201·80 (203·356 I.Wts.). *Dose,* ¼ to 1 ounce (8 to 30 Gm.).

Deliquescent crystals, very soluble in water. Is a mild purgative useful in constipation.

Magnesii Glycerophosphas, *v.p.* 48.

Magnesii Hydroxidum, $Mg(OH)_2$=57·94 (58·376 I. Wts.). *Syn.* MAGNÉSIE HYDRATÉE. *Codex.*

Dose.—5 grains to 2 drachms (0·32 to 8 Gm.)

Prepared by double decomposition of Magnesium Sulphate 24½ and Sodium Hydroxide 8 in solution, the precipitate washed free from sulphate and dried cautiously.

According to the Codex, calcined magnesia is boiled with 20 to 30 times its weight of water 20 minutes. Dry as much as possible by collecting on calico and finally at 50°C. until it no longer loses weight. Thus prepared Magnesium Hydroxide contains 31% H_2O.

Pulvis Magnesii Hydroxidi cum Carbone.

Dose.—1 to 2 drachms in a little water after meals.

Magnesium Hydroxide 1, Wood Charcoal 2.

Is suggested in dyspepsia. The Magnesium Hydroxide is antacid and the charcoal has the useful property of gas absorption. Furthermore, the charcoal would tend to preserve the hydroxide.

A little cinnamon powder is occasionally added.

Cremor Magnesiæ. MAGNESIA CREAM.

Dose.—1 to 4 drachms in a little water.

A palatable concentrated preparation. Each ounce

represents 24 grains of suspended Magnesium Hydroxide. Antacid without evolving Carbon Dioxide—hence no distension is caused.

Uses.—In indigestion, dyspepsia, acidity, rheumatism, and as an alkaline mouth wash, forming a film of Magnesium Hydrate over the tooth surface. A useful antidote in case of poisoning by mineral acids.

Magnesii Peroxidum, *v.p.*412.

Magnesii Sulphas. (*Off.*) **U.S.**

$MgSO_4.7H_2O$=244·68 (246·532 I. Wts.) (244·69 U.S. Wts.)

Dose.—30 to 120 grains repeated, or ¼ to ½ ounce for a single administration.

Soluble 10 in 13 of water—measuring 18.

Incompatible with Soda Tartarata.

Dysentery in South Africa treated by the "Evacuant Method"—Magnesium and Sodium Sulphates, Castor Oil, Calomel, also with Ipecacuanha Powder.—L.ii./03.7.

Solutions kept ready for dispensing should be well sterilised, this will effectually prevent the fungoid growth which occasionally occurs.

Intraspinal Anæsthesia has been induced by injecting Magnesium Sulphate in dilute solution. Intracerebral injection cured tetanus (desperate case in which 115 Cc. of Antitoxin had failed).

The highest dose employed was 0.2 Gm. per kilo, or 15 drops of a 25% solution for each twenty pounds of body weight.—M. Arch. 1906,28; L. i./06,127.

Intravenouslymagnesium salts are very toxic, notably on the respiration centre.—J.C.S.A., April, 1906,244.

Used with injurious effect in the manufacture of cheap varieties of flannel and linen.—L.i./06,49.

Magnesii Sulphas Effervescens (*Off.*) **U.S.**

Dose.—½ to 1 ounce (15 to 30 Gm.), or 1 to 4 drachms (4 to 16 Gm.) repeated.

Magnesium Sulphate 50, Sodium Bicarbonate 36, Tartaric Acid 19, Citric Acid 12½, Refined Sugar 10½. U.S. has 50, 40·3, 21·1, 13·6 respectively and no sugar.

Enema Magnesii Sulphatis. ½ to 2 ounces in ½ to 1 pint of water.

Enema Magnesii Sulphatis Acida.

Syn. HENRY'S SOLUTION.

Magnesium Sulphate 7 ounces, Dilute Sulphuric Acid 1 ounce. Distilled Water 7 ounces.

'Vescettes' of Magnesium Sulphate, each containing 30 grains. To be crushed and dissolved in a small draught of warm water.

Mistura Alba. *Dose*—½ to 2 ounces.

This is a pleasant and efficient aperient.

St. Th. H. has Magnesium Sulphate 30 grains, Magnesium Carbonate 15 grains, and Peppermint Water 1 ounce.

U.C.H. has 60 and 80 grains respectively.

Magnesia Mixture.

Solution of Magnesium Ammonio-Sulphate (*Off.*). Dissolve Magnesium Sulphate 20, Ammonium Chloride 40, in water 160, add Ammonia Solution 84. Allow to deposit in stoppered bottle before use. Is employed for the gravimetric estimation of phosphates. Ammonium Magnesium Phosphate is precipitated and converted by incinerating into Magnesium Pyrophosphate $Mg_2P_2O_7 = 221{\cdot}12$ (222·72 I. Wts).

Mistura Magnesii Sulphatis Composita.

Dose.—2 to 4 drachms.

Magnesium Sulphate 8 ounces, Compound Tincture of Cardamoms ½ ounce, Vanillin Solution ½ drachm, Saccharin Elixir 2 drachms, Glycerin ½ ounce, Coffee Infusion (2 ounces to the pint) *q.s.* to 1 pint. Is useful in inebriety.

Magnesii Sulphis, *v.p.*70.

MALTUM.

Maltum, U.S. Grain of barley partially germinated artificially and then dried. Yields 70% extract. The acidity calculated as lactic acid should not exceed 0·3%.

Malti Pulvis. *Dose.*—1 to 2 drachms (4 to 8 Gm.).

Malt flour or entire malt powdered, is added to baked wheaten flour in various proportions to form the popular infants' foods, and is given to assist digestion. When these are mixed with hot water or a mixture of hot milk and water, the starch contained in the wheaten flour becomes soluble and digested into dextrin and malt sugar. The diastasic property of malt is most acute in aqueous solution at 104° F.—a boiling heat destroys it. A small teaspoonful of malt flour may be sprinkled over or mixed with cooked farinaceous foods, such as porridge, gruel, bread and milk, or arrowroot, when cool enough to sip, or it may be infused in a cup of coffee, glass of beer, or cold water; the latter form pleasant and useful beverages

when taken with meals, to assist the digestion of bread or other farinaceous food.

Diastase or *Maltine, Codex Supp.* Obtained by exhausting malt with tepid water, precipitating with alcohol, and drying under 45° C. Is a yellowish white powder or in translucent scales. Diastase should convert 300 times its weight of starch into sugar and dextrin. Its use is indicated by the presence of starch grains in the fæces, or urine.

Extractum Malti, U.S. B.P.C., G.H.—*Syn.* EXTRACTUM BYNES. *Dose.*—1 to 4 drachms (4 to 16 Gm.).

A syrupy, yellowish brown liquid, having a pleasant sweet taste, consisting principally of dextrin and malt sugar (maltose), and possessing some diastasic properties. It is made by mixing malt with tepid water, pressing, filtering, and evaporating below 130° F. Extract of Malt and its preparations are prescribed in cases of debility of all kinds, as a restorative, like cod liver oil, but particularly where digestion is weak. Its diastasic power is standardised by decoction of starch.

It should digest twice its weight of arrowroot starch in 30 minutes at 40° C. (B.P.C.)

Caspari recommends the titration of the resulting Dextrose with Fehling's Solution. 1 Cc. of this = 0·005 Gm. Dextrose =0·0045 Gm of starch converted thereinto.

Determination of Solids, Proteid, Diastase, in Commercial Extracts.—P.J. July, 28,06.

In addition to the nitrogenous constituent diastase, and maltose, the saccharine component, extract of malt contains a considerable proportion of phosphates, &c., albuminoid constituents as well as aromatic principles.

Maltine (a trade mark) is sold plain; with cod liver oil 30%; with iron pyrophosphate 8 grains to the ounce; with pepsin and pancreatin; with hypophosphites of lime 3 grains, of soda 3 grains, of iron 2 grains in the ounce; with phosphate of lime 4 grains, of soda 4 grains, and of iron 3 grains in the ounce (Malted chemical food); with iron pyrophosphate 4 grains, quinine 1 grain and strychnine $\frac{2}{15}$ grains in each ounce; with cascara=66 minims of liquid extract; and with creosote 4 minims to the ounce.

Extractum Malti Liquidum. Bynin.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

In place of evaporating malt infusion to the viscosity of the solid extract, if it be concentrated in vacuo to prevent decomposition of the ferment diastase until it has Sp. Gr. 1·375, and about 7% of alcohol added,

making the finished product of Sp. Gr. 1·250, a liquid extract is formed which is more convenient.

Bynin Amara.

Dose.—2 to 4 drachms well diluted.

Contains Quinine Phosphate 1½ grains, Iron Phosphate 2 grains, Strychnine Phosphate $\frac{1}{16}$ grain, in liquid malt extract (Bynin) 1 ounce. It is ¼ the strength of Easton Syrup.

Extractum Malti Siccum.

Contains about 75% Maltose, 1·5% Phosphates, 5% Albuminoids. *Dose.*—1 to 2 drachms.

A somewhat hygroscopic yellowish coarse powder, easily soluble in water.

By desiccation carefully *in vacuo* this powdered malt extract has the advantage of keeping qualities, particularly for export to all climates.

The digestive qualities of this dried malt extract have been the subject of careful investigation by us. Commercial samples, tested by the B.P.C. method, gave diastasic value in the following order:—

(1) Ordinary thick malt extract.
(2) Dried malt extract manufactured in England.
(3) ,, ,, ,, ,, ,, Germany.

There was not a very marked difference in time between (1) and (2).

Examination of commercial malt extracts.—P. J. ii./06,94.

Extractum Malti Ferratum, G.H.

Iron Pyrophosphate 2, Water 3. Dissolve and add Extract of Malt 95. *Dose*, 1 to 4 drachms (4 to 16 Gm.).

Extractum Malti cum Glycerophosphatibus, *v.p.* 50.

Extractum Malti cum Syrupo Ferri Phosphatis. *Dose.*—1 to 4 drachms.

Containing in each drachm: Phosphate of Iron ¼ grain, and ½ grain Calcium Phosphate, together with ¼ grain each of Sodium and Potassium Phosphates.

Extractum Malti cum Oleo Morrhuæ, G.H., B.P.C. *Dose.*—1 to 4 drachms (3·5 to 15 Cc.).

The amount of oil in this preparation is variable—it should be at least 15% (20 G.H.; 25 St. Th. H. and L.H.).—P.J. 1894,162. A little salicylic acid is often added to preserve it.

Taka-Diastase. *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.).

A whitish powder obtained by the cultivation of a fungus, *Eurotium Oryzæ*, on bran ; possesses amylolytic properties.—L. i./95,1332 ; i./96,856.

Useful for gouty dyspepsia and hyperacidity of the stomach.—L. ii./03,1052.

MANGANESIUM.

Mn=54·52 (55 I. Wts.) (54·6 U.S. Wts.)

Manganesii Oxidum Præcipitatum, U.S.

Dose.—3 to 10 grains (0·2 to 0·65 Gm.), or more, in pills with syrup. Tablets, 2 grains (0·13 Gm.).

Manufactured by removing the matter soluble in dilute hydrochloric acid from commercial manganese oxide, removing the acid and washing the residue with water, utilising the lighter portions only of the residue.

Consists principally of manganic oxide MnO_2 = 86·28 (87·0 I. Wts. ; 86.36 U.S. Wts.) (U.S. contains not less than 80% MnO_2), a bulky blackish brown powder, free from grittiness and entirely soluble in cold hydrochloric acid. ***Uses.*** — In gastrodynia, pyrosis, and in amenorrhœa taken 3 or 4 times a day before expected period.

In chlorosis it assists the action of iron salts, and is less irritant than the permanganates.

Manganesii Citras. 'Soluble.' *Dose.*—3 to 5 grains (0·2 to 0·3 Gm.).

This is a double salt with Sodium Citrate. **Ferro-Manganese Citrate.** *Dose.*—3 to 10 grains (0·2 to 0·65 Gm.) [and combined with Quinine 15%. *Dose.*—3 to 5 grains (0·2 to 0·3 Gm.) and with Strychnine 1%. *Dose.*—1 grain (0.065 Gm.)] and Ferro-Manganese Phosphate—*Dose.*—3 to 10 grains (0·2 to 0·65 Gm.)—are also prepared.—P.J. i./01,136 ; Y B.P. 1901,458.

Manganesii Hypophosphis, U.S. $MnP_2H_4O_4 + H_2O$ = 201·52 (201·54 U.S. Wts. ; 203·048 I.Wts.). *Dose.*—1 to 10 grains (0·065 to 0·65 Gm.).

A white or slightly rose-tinted powder, soluble 1 in 10 of water. A nerve stimulant.

Manganesii Phosphas $Mn_3P_2O_8.7H_2O = 477{\cdot}36$ (481·112 I. Wts.). *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.).

A white powder, generally with a pinkish tint, insoluble in water. From ½ to 1 grain is sometimes given in 1 drachm of syrup of ferrous phosphate.

Manganesii Sulphas, $MnSO_4 + 4H_2O = 221{\cdot}38$ (221·47 U.S. Wts.; 223·124 I. Wts.).

Dose, of powder.—2 to 10 grains (0·13 to 4 Gm.).

A white powder with a faint pink tint, due to a little manganic sulphate or in pink crystals. ***Soluble*** about 1 in 1½ water. For jaundice, 60 grains is a cholagogue purgative; not reliable, may cause sickness. Has been used for jaundice.

Potassii Permanganas (*Off.*). $K_2Mn_2O_8 = 313{\cdot}74$ (316·3 I. Wts.); U.S. $KMnO_4 = 156{\cdot}98$ U.S. Wts.

Dose.—1 to 3 grains (0·065 to 0·2 Gm.) in well-diluted solution, or in pill.

Capsules contain 1 grain (0·065 Gm.).

Potassium Permanganate may be prepared by oxidising manganese dioxide by the aid of potassium chlorate in the presence of potassium hydroxide.

Incompatible with all vegetable oxidisable matter, *e.g.*, glycerin, alcohol, sugar, fats and volatile oils, with ammonia, ammonium salts and alkaloids.

Uses.—The disinfecting properties of a solution of this salt are well known. The official **Solution** contains 1%. The **Saturated Solution** contains 1 in 20 of water. It has the advantage over other disinfectants in having a distinctive colour; it has no disagreeable odour, and besides being a deodoriser, it quickly disintegrates all fetid and decomposing organic substances and albuminoid bodies, whether in a solid form or in solution, living or dead, with which it comes in contact. It destroys bacteria with great rapidity.

A solution $\frac{N}{511}$ is antiseptic and $\frac{N}{458}$ is germicidal to *B. typhosus.*—J.C.S.A., April, 1906,245.

Potassium permanganate is used for dyeing white hair to a chestnut brown colour.

In amenorrhœa, 1 or 2 grains, in a pill 3 or 4 times a day for a few days before the time of the expected period, will bring on the flow almost to a certainty.

Danger of ulceration being caused by permanganate tablets.—B.M.J. i./85,308,413,516,764,974.

In gonorrhœa, solution of ½ grain in 1 ounce recommended as an injection.

Gargle, Mouth Wash, or **Vaginal Injection**, 1 of the official liquor in 50 of water is useful,

St. M.'s H. for gargle has official liquor 12 minims to water 1 ounce.

Rectal injections of 4 grains to the pint of water check asylum dysentery.—L. i./02,588.

Potassium Permanganate Pencils. Melt sodium phosphate (Na_2HPO_4 $12H_2O$) in a porcelain dish, and add prescribed amount of the permanganate. Pour into moulds greased with soft paraffin. Store in sealed glass tubes.—C.D. ii./05,1052.

Useful for applying to foul ulcers and patches of gangrene and to carbuncles as mild caustic.

In bromidrosis, wash the feet first in benzene, then in 1% permanganate (at night). Powder (during the day) with Potassium Permanganate 13, Alum 1, Talc 50, Zinc Oxide 18, Zinc Chloride 18. Bath of borax and benzoin also useful.—M.A. 1906,150.

Snake bite lancets are prepared containing the crystals.—C.D. ii./04,988.

Directions.—Squeeze the part so as to press out the venom, then cut with the lancet, making several incisions deeper than the bite, and rub in the dry crystals thoroughly, moistening with water if necessary. Tie a ligature or handkerchief between the bite and the heart as soon as possible to prevent the venom getting into the circulatory system. Equally good in all kinds of snake bite; results.—B.M.J. ii./05,1290.

Snake poisoning treated successfully by free injection of 15% solution. 90 grains used in multiple injections with free incisions.—B.M.J. ii./92,728.

Potassium permanganate is, perhaps, one of the best antidotes for morphine and opium poisoning, as it decomposes the alkaloid when in solution, but the two must come into contact.—B.M.J. i./94,649; ii./95,76; ./96,82,1193,1194; P.J. i./96,413; L. ii./97,1113.

A successful antidote to phosphorus, *v.p.*547.

Also antidotal to strychnine, colchicum, savin, and oxalic acid poisoning in animals; and if administered immediately, to cyanide of potassium.

A saturated solution applied to ulcerating lupus of the face with good results.—B.M.J. ii./03, 194.

Nebula Potassii Permanganatis, T. H. Potassium Permanganate 1 grain, Sodium Chloride 5 grains, water to 1 ounce.

Pilula Potassii Permanganatis.

Potassium Permanganate ... 1, 1½, 2, 3, 4 or 5 grains.
Kaolin Ointment, *q.v.* ... *q.s.*

To make a pill, care must be taken not to triturate Potassium Permanganate with any easily oxidised substance, like sugar, syrup, or glycerin, else spontaneous combustion may occur. The pills may be coated with sandarach solution and rendered tasteless. A solution of Potassium Permanganate is very nauseous.

Tablets contain 1, 2 and 3 grains. To be dissolved.

'**Solubes**' 5 grains for preparing lotions and vaginal injections; to be dissolved in ½ a pint or more of water.

Sal Hartini, Hartin's Crimson Salt, is said to contain Potassium Permanganate.

Calcium Permanganate.

$Ca(MnO_4)_2 + 5H_2O = 365{\cdot}19$ (368·18 I. Wts.).

Is preferred for making mouth lotions, as it has least taste. Very soluble in water. Possesses far greater sterilising power than potassium permanganate. 1 in 100,000 to sterilise water in 5 minutes.—P.J. i./95, 1092; ii./95,69.

Antidotal to strychnine, morphine and other alkaloids. —J.C.S.A. i./1905,107.

Sodium Permanganate,

$Na_2Mn_2O_8 = 281{\cdot}84$ (284·1 I. Wts.) in solution, red in colour, is used as a cheap disinfectant. **Condy's Red Fluid** contains this salt. This manufacturer's **green fluid** has Sodium Manganate $Na_2MnO_4 = 163{\cdot}8$ (165·1 I. Wts.) in solution.—L.ii./00,1587; i./03,971.

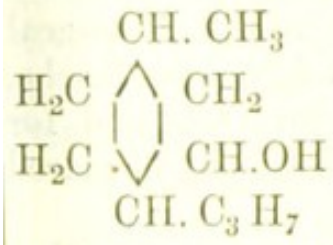
Zinc Permanganate,

$Zn(MnO_4)_2 + 2H_2O = 336{\cdot}75$ (339·432 I. Wts.). In deliquescent dark brown iridescent crystals, like the Potassium salt, is used for lotions and injections, 1 grain in 8 ounces, where the astringent action of the zinc is indicated, *v.p.*720.

Liquor Ferro-Manganesii Peptonati, *v.p.*344.

MENTHOL (*Off.*).

METHYL-PROPYL-PHENOL HEXAHYDRIDE.



$= 154{\cdot}98$ (B.P. and U.S. Wts.) (158·16 I. Wts.).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) or more in a pill with powdered soap, or in solution in olive oil.

A white crystalline substance deposited on cooling Oil of Peppermint.* Obtained from *Mentha arvensis, vars. piperascens et glabrata*, and of *M. piperita* (*Labiatæ*), it melts at 107·6° F.

Soluble 5 in 1 of 90% Alcohol, also in Ether 2 in 1, Chloroform 4 in 1 approximately, 1 in 4 of Olive Oil, and in Petroleum Spirit 10 in 7; sparingly soluble in water, but it imparts to it the odour and taste of mint; insoluble in glycerin.

It produces a warmth and glow on the tongue, and sensation of coolness on drawing the breath over it.

Uses.—Given internally, it acts as a diffusible stimulant. Its solutions, applied topically to the skin affect the nerves of the part somewhat like aconite, and form useful liniments for headache, rheumatic pains and neuralgia, having the advantage of being non-poisonous. It has antiseptic properties, and is not caustic; its action resembles that of an anæsthetic, and gives great relief in

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*U.S. requires not less than 8% ester calculated as Menthyl acetate, not less than 50% of total Menthol (free and as ester).

Oleum Menthæ Viridis, U.S., is distilled from fresh flowering Spearmint, *Mentha Viridis* (*Labiatæ*).

Spiritus Menthæ Viridis, U.S. Spearmint Oil 10, Spearmint 1, Alcohol to 100, macerate 24 hours. *Average dose.*—30 minims.

Spiritus Menthæ Piperitæ, U.S. Peppermint Oil 10, Peppermint 1, Alcohol to 100, macerate 24 hours. Dose as last.

Aqua Menthæ Piperitæ Concentrata. This in commerce is a solution of the Oil in Alcohol. Ph. Form., 555, gives Peppermint Oil 100 minims, Light Magnesium Carbonate 2 drachms, Alcohol 90% 3 ounces, Water 1 ounce. For dilution, 1 to 39.

Quillaia Tincture is suggested for use as follows: Peppermint Oil 4 drachms, Quillaia Tincture 2 drachms, Water to 2 ounces. For dilution, 1 drachm to water 6 ounces.—B.M.J. 1896,318 (Danger?) 480.

prurigo urticaria and pruritus ani. It is moulded into cones, sticks and pencils, for relieving neuralgia. It liquefies when gently rubbed on the painful part.

Pigment, 1 in 4 of oil, is used to relieve laryngeal tubercular ulceration. As an antineuralgic in toothache, 1 in 60 of Alcohol with a little Clove Oil, and for sciatica. The crystals also on cotton wool may be placed in the hollow of an aching tooth.

Menthol liquefies with an equal amount of either Carbolic Acid, Chloral Hydrate or Thymol, also 3 parts of Menthol and 2 parts of Camphor, 2 parts of Menthol and 1 part of Butyl Chloral Hydrate, and 2 parts of Menthol, with 1 of each Phenol and Butyl Chloral Hydrate. These form colourless transparent oily fluids; when applied on cotton wool are useful for relieving toothache arising from carious teeth, or preparing them for stopping; the pain is promptly relieved, and all symptoms obtunded during the process of filling. Its Camphor and Phenol combinations are used to medicate **oro-nasal 'Ozonic' and the Nasal 'Ozonic,'** and other **dry inhalers,** and are most beneficial for arresting and curing colds, and relieving influenza and chest affections.

For the inhalation of hot medicated moist air the **'Portable'** and **'Poor Man's Inhaler'** may be used, *c.f.* Creosote and other vapors.

Menthol Camphor and other combinations, diluted with a heavy mineral oil, or preferably in spirituous solution, for spraying into the nares or inhaled as above, relieves swelling and irritability of nasal catarrh, contracts capillary blood-vessels of mucous membrane, reduces swelling, relieves pain and fulness of head, arrests sneezing, checks excessive discharge, and corrects perverted secretion.

Aqua Menthol. Menthol 8 grains, Alcohol (90%) 2 drachms, Distilled Water 20 ounces.

Emplastrum Menthol, Menthol Plaster (*Off.*). Menthol 1½, dissolved in melted Yellow Wax 1, and Resin 7½. Useful for rheumatism and intercostal neuralgia.

Injectio Menthol, C.L.T.E.

Menthol 2½ gr., Liquid Paraffin 1 ounce. For use with an Eustachian catheter to the middle ear.

In asthma, intratracheal injection of large doses, *e.g.*, Menthol 30 grains in Glycerin 2 ounces, daily for some weeks advocated. Most efficacious during acute attacks. Liv. Med. J.C., Jan. 1904.—M.A., 1906, 132. Does not dissolve.—W. H. M.

Insufflatio Menthol, Menthol Snuff. For nasal catarrh, consisting of Menthol 1, Ammonium Chloride 3, Boric Acid 2, and Lycopodium 6, gives great relief. Another formula:—Menthol 1, Boric Acid 10, Ground Coffee 10.

Insufflatio Menthol Composita. C.L.T.E. Menthol 2, Ammonium Chloride 3, Boric Acid Powder 3.

Insufflatio Menthol et Cocainæ. R.F.H. Cocaine Hydrochloride ½ grain, Menthol 3 grains, Boric Acid Powder ½ ounce, Bismuth Carbonate ½ ounce.

Insufflators.—Butlin's, for self use; Lucas's, rubber ball and vulcanite tube; Maw's, glass barrel and rubber ball; Kabierske's, glass chamber, rubber ball and vulcanite mount.

Some are arranged of metal which are capable of sterilisation.—B.M.J., i./03,88.

Linimentum Menthol.

Menthol 3, Chloroform 4, Olive Oil *q.s.* to 16; is useful in lumbago, neuralgia, sciatica, and ringworm.

Menthol-Paraffin Capsules contain a saturated solution of menthol in liquid paraffin. These are of gelatin with elongated ends, which can be torn off, and the contents dropped into the ear to abort boils and to relieve earache.

Menthol cum Aconitina. Add Aconitine 1 grain, in 90% Alcohol 20 minims, to Menthol (melted) to make 300, 400, or 500 grains. Divide into 60-grain cones.

Mentholeate. Menthol 200 grains, Oleic Acid ½ ounce. Heat gently to dissolve. Useful in pruritus, etc., where absorption is desired.—Pr. xl.65.

Pastillus Menthol, T.H., contains $\frac{1}{6}$ grain.

Pigmentum Menthol, G.H.—1 to Olive Oil 4. Painted or injected into the larynx, or even the trachea, useful in phthisis and laryngeal disease. Also applied on wool for ear affections.—Pr. xlvi. 142; B.M.J. ii./92,252. **Nebula Menthol,** a solution in liquid paraffin is used for spray or pigment for throat, 5 to 10 grs. to ounce, T.H., or Olive Oil, C.L.T.E.

Tabellæ Menthol. *Dose.*—1 or 2, *ad libitum*.
Contain $\frac{1}{5}$ grain menthol, combined with chocolate, the oil of which fixes it.

Tinctura Menthol Ætherea, for local application:
Menthol 1, Purified Ether 4 and Chloroform 4. In neuralgia, best applied with a glass brush.

Menthol Spray.—Menthol 1, Chloroform 10, Ether 16, produces temporary local anæsthesia.

For ringworm of the scalp, 1 part Menthol in 4 volumes of Chloroform and 12 volumes Olive Oil.

Menthol inhaled relieves cough.—B.M.J.E. ii./01,59.

For threadworms injection of Menthol 1 grain in Olive Oil 1 ounce useful.

Unguentum Menthol, T.H. Menthol 5 grains to 1 ounce of Vaseline. Arthritic pharyngitis may be treated with Ointment of Menthol 6 grains, Boric Acid 15 grains, Soft Paraffin 1 ounce, introduced into the nostrils morning and evening.

Wool, Menthol. 10%. Useful to plug the nose in nasal catarrh.

Validol. *Dose.*—10 to 15 minims (0·6 to 0·9 Cc.).
A specialty said to contain 30% of menthol in methyl valerianate, is a colourless liquid with an agreeable odour and free from burning taste of menthol. Given in wine or on a lump of sugar it acts as a useful analeptic in the depression of hysteria or in neurasthenia. Is also recommended in sea sickness, and furthermore found useful in cardialgia and gastralgia.—B.M.J.E.ii./04,35.

METHYL CHLORIDUM.

$CH_3Cl = 50{\cdot}10$ (50·474 I. Wts.).

This gas, compressed into metal cylinders, is used as a local anæsthetic ; applied as a jet, it freezes the part by the intense cold it produces.

Uses.—In scraping lupus it is best applied by means of a camel-hair brush from a glass vacuum tube or 'thermo-isolator.' It is used in the treatment of sciatica and neuralgia with success, nodular and chronic rheumatism, stitch in the side, and the pleurisy of tuberculosis. The spray is applied obliquely, not perpendicularly, on the cutaneous surface, and only for five or six seconds, or if prolonged, blisters or eschars may

result; to obviate these possible ill effects the skin should be painted with glycerin, or a little should be applied on cotton wool. Is a constituent of Somnoform.

METHYLENE.

$CH_2Cl_2 = 84{\cdot}29$ (84·916 I. Wts.).

Syn. METHYLENE BICHLORIDE.

Under this name is sold an anæsthetic, which is a dense colourless ethereal liquid, with a chloroform-like odour. It has, however, caused many deaths.

It is more rapid in producing unconsciousness than chloroform, and quicker in passing off.

MOLLINUM.

A white inodorous soap, containing about 17% excess of fatty matter. Recommended as a basis for ointments for rapid absorption, it is readily washed off with water, with which it forms a lather. It leaves the skin fresh and supple, and makes no grease spots on linen. **Mollinum Hydrargyri** and **Mollinum Potassii Iodidi** contain 33% and 10% respectively of mercury and potassium iodide. It is not incompatible with mercuric chloride, 1% of this, or less is useful in gynæcology. It blends well with respectively 3 to 5% of phenol and salicylic acid and thymol, and with tar (birch tar particularly) 10 to 20% for psoriasis;—with 30 to 50% of sulphur or 10% of storax for acne and scabies;—with 5% of chrysarobin or naphthol;—and with 10% of ichthyol, resorcin, iodoform, naphthalene, or white precipitate.

MORPHINA.

$C_{17}H_{19}NO_3,H_2O$ or $C_{17}H_{17}NO(OH)_2,H_2O = 300{\cdot}93$ (300·92 U.S. Wts.) (303·208 I. Wts.)

Dose.—$\frac{1}{10}$ to $\frac{1}{3}$ grain (0·0065 to 0·02 Gm.)

This, the principal alkaloid of opium, is in a white powder, or in white, shining crystals, insoluble in water and ether. ***Soluble*** in alcohol 90% slightly; glycerin 1 in 150, oleic acid 1 in 10; solutions of its salts are precipitated by ammonia and by potash (but

re-dissolved in the latter). It loses about 6% of its weight on drying at 90° C., 3 parts of Morphine are medically and commercially reckoned equal to 4 parts of any of the official salts.

The alkaloids Morphine, Codeine, Apomorphine and Apocodeine produce, in the order named, an increasing fall of blood pressure, corresponding exactly to their capability of paralysing certain sympathetic nerve cells.

Morphine is entirely excreted by the alimentary canal even when injected. It can be found 5 minutes after hypodermic injection, in the stomach. Only the minutest quantity is excreted in the urine.—Dixon.

Incompatibility.—Morphine salts are decomposed by alkalis, and solutions are precipitated by vegetable compounds containing tannin, also with iron, lead, manganese, silver, copper and zinc salts, Liquor Arsenicalis, and potassium permanganate.

Antidotes.—Emetics should first be given and the stomach tube used. Wash out the stomach with Potassium Permanganate Solution; give strong hot coffee, or Ammonia, or Ether, Amyl nitrite inhalation. Physiological antidotes are Belladonna and Atropine. $\frac{1}{20}$ grain of the latter antagonises 1 grain Morphine. The following have also been given with good effect:—Nitroglycerin, Picrotoxin, Pilocarpine, Strychnine, Oxygen inhalation, Saline Solution intravenously (for the latter *vide* L. i./02,1317) and Brandy *per rectum*.

Cure of Morphine poisoning by inhalations of Oxygen.—L. ii./98,545. By nitroglycerin.—B.M.J.E. ii./90,77.

$\frac{3}{10}$ grain Atropine, in doses of $\frac{1}{10}$ grain at intervals brought recovery in an almost hopeless case where 4 grains of Morphine had been injected.—B.M.J. i./05, 1040.

Puerperal eclampsia well treated by hypodermic injections of Morphine salts.—B.M.J. ii./03,1212.

Calcium permanganate 5% solution is antagonistic (decomposes).—J.C.S.A. i./05,107.

Hæmoptysis treated by $\frac{1}{6}$ to $\frac{1}{3}$ grain hypodermically.—B.M.J. ii./04,1635,1783. Excellent.—W.W.W.

Isolation of morphine in toxicology.—P.J. ii./05,617.

In **Morphine Habit,** Sparteine Sulphate is recommended to gradually replace the Morphine solution, commencing with $\frac{1}{3}$, increased to $\frac{2}{3}$ grain, four to six times a day. Sodium Bromide and Nitroglycerin Tablets are useful, *q.v.*

Camphor has been given to relieve the craving.—B.M.J.E. ii./02,56; also Heroin. B.M.J.E. ii./01,24; Dionin, B.M.J.E. i./99,83.

Oleatum Morphinæ.

Morphine 1, Oleic Acid 60. Dissolve.

Oleic acid will dissolve as much as one-tenth of its weight of pure morphine. Morphine is added to oleate of mercury to relieve pain.

Morphinated Water (*Off.*).

Chloroform Water saturated with Morphine; is used in testing opium.

Morphinæ Acetas, Morphine Acetate (*Off.*) **U.S.**

$C_{17}H_{19}NO_3$, $C_2H_4O_2$, $3H_2O = 396{\cdot}27$ (396·26 U.S. Wts.; 399·272 I. Wts.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.), which may be increased.

A white powder, ***soluble*** 1 in 2½ of water (if recently made, or a little Acetic Acid may be required as the salt loses some on exposure), soluble also about 1 in 100 in Alcohol 90%, Glycerin 1 in 5. Liable to change and darken in colour.

Injectio Morphinæ Acetatis Hypodermica, *Martindale.*

1 grain in 6 minims. *Dose.*—1 to 2 minims.

Place Morphine (pure alkaloid) 60 grains in an ounce vial and moisten with Distilled Water 6 drachms. Add Acetic Acid 40 minims, or *q.s.* to make the solution nearly bright after being kept closed at a gentle heat for 24 hours. Then filter and wash the filter with sufficient Distilled Water to make 1 ounce. Shake and keep from light in bottles, the stoppers of which should be greased with soft paraffin. This will prevent the Morphine incrusting the neck of the bottle; a few drops of glycerin added, will, it is said, prevent the incrustation. It has a straw colour, changing to vinegar-brown on keeping.

On account of the *small quantity of liquid,* this injection (1 *grain in* 6 *minims*) is preferred.

Solution.—Carefully distinguish this from the official injection, Morphine Tartrate (1 *grain in* 22 *minims*).

In B.P. 1885, the official Hypodermic Injection contained 1 grain of Morphine Acetate in 10 minims.

Injectio Morphinæ et Atropinæ Hypodermica, *Martindale.*

Contains Atropine Sulphate 1 grain in 3 drachms of Injection of Morphine Acetate (1 grain in 6 minims).

Dose.—1 to 3 minims. 3 minims contain half a grain of morphine acetate and $\frac{1}{60}$ grain of atropine sulphate. Some practitioners prefer to use it *half* this strength. Although atropine is in many respects antagonistic to morphine, yet, given in combination with it in small doses, the former increases the sedative action and counteracts the disagreeable effects of the latter on the head, stomach, and bowels.

Ophthalmic Discs contain $\frac{1}{500}$ grain **Morphine** and $\frac{1}{300}$ grain **Morphine** with $\frac{1}{5000}$ grain **Atropine** respectively.

Liquor Morphinæ Acetatis (*Off.*).

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Morphine Acetate 1, Diluted Acetic Acid 2, Alcohol (90%) 25, Distilled Water to 100.

Pastillus Morphinæ Acetatis ($\frac{1}{30}$ gr.), *v.p.*370.

Pastillus Cocainæ ($\frac{1}{15}$ gr.) **et Morphinæ** ($\frac{1}{30}$ gr.)

Unguentum Morphinæ cum Acido Tannico.

Morphine Acetate 1, Tannic Acid 10, Soft Petroleum to 250. Suggested in chronic rhinitis.

Morphinæ Hydrobromidum.

$C_{17}H_{19}NO_3.HBr.2H_2O = 399{\cdot}16$ (402·192 I.Wts.)

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.).

A white powder, soluble 1 in 22 of water and about 1 in 50 alcohol 90%. Given with hydrobromic acid as sedative, affects the head less.

Morphinæ Hydrochloridum. (*Off.*). **U.S.**

$C_{17}H_{19}NO_3HCl.3H_2O = 372{\cdot}88$ (372·86 U.S. Wts.) (375·698 I. Wts.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.), which may be increased.

In silky white crystals or in powder soluble 1 in 24 of water, about 1 in 50 of alcohol 90%, and about 1 in 3 of Glycerin. Officially this dissolves in Sulphuric Acid without colour. (P.G. iv. states without colour or only slight rose colour.)

Insufflatio Morphinæ.

Morphine Hydrochloride $\frac{1}{4}$ grain, Bismuth Oxychloride 1 grain, Starch $\frac{1}{2}$ grain.

Linctus Morphinæ, U.C.H.

Solution of Morphine Hydrochloride 3 minims, Chloroform Emulsion 3 minims, Treacle 60 grains, Water to 1 drachm. May be more agreeably flavoured with syrup of lemon.

Dose.—A teaspoonful 3 or 4 times a day; repeated frequently when cough is troublesome. Taken undiluted, swallowed very slowly. For children of 8 to 14 years, dose 10 to 20 drops. Not suitable for very young children, or where there is difficulty of expectoration in bronchitis.

St. M.'s H. has Morphine Hydrochloride Solution 5 minims, Honey $\frac{1}{2}$ drachm, Water to 1 drachm.

Mistura Morphinæ et Phenazoni Composita.

Dose.—1 ounce.

Solution of Morphine Hydrochloride 10 minims, Phenazone 10 grains, Tincture of Castor 20 minims, Spirit of Chloroform 10 minims, Mucilage and Water to 1 ounce.

This forms what may be designated a specific for spasmodic dysmenorrhœa.—W.W.W.

Linctus Sedativus, Brompton H. *Dose.*—1 drachm.

Solution of Morphine Acetate 8 minims, Chloric Ether 3 minims, Lemon Juice 15 minims, Mucilage of Acacia to 1 drachm.

Liquor Morphinæ Hydrochloridi (*Off.*).

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Morphine Hydrochloride 1, Diluted Hydrochloric Acid Alcohol (90%) 25, Distilled Water to 100.

Mistura Anodyna, N.H.W.

Solution of Morphine Hydrochloride 20 minims, Sal Volatile $\frac{1}{2}$ drachm, Water to $\frac{1}{2}$ ounce.

Suppositoria Morphinæ.

Morphine hydrochloride $\frac{1}{4}$gr. (*Off.*), also $\frac{1}{2}$, 1, $1\frac{1}{2}$, and 2 gr.

Tablets, Hypodermic, contain $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain.

Suppositoria Belladonnæ et Morphinæ, *v.p.*174.

Trochisci Morphinæ (*Off.*).

Contain $\frac{1}{360}$ grain (0·0018 Gm.) of the hydrochloride in each lozenge, with a sugar basis flavoured with tolu.

Trochisci Morphinæ et Emetin, *v.p.*448.

Trochisci Morphinæ et Ipecacuanhæ (*Off.*).

Contain $\frac{1}{36}$ grain (0·0018 Gm.) of morphine hydrochloride, with $\frac{1}{12}$ grain (0·0054 Gm.) of ipecacuanha in each. These lozenges are often given to allay cough.

Morphinæ Lactas.

$C_{17}H_{19}NO_3.CH_3-CH<^{OH}_{COOH}$=372·42(375·24 I.Wts.)

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.).

A very soluble salt—dissolving about 1 in 8 of water.

Morphinæ Meconas.—Morphine Meconate.

$(C_{17}H_{19}NO_3)_2C_7H_4O_7+5H_2O$=854·03(860·496 I.Wts.)

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.).

This, one of the natural salts of morphine in opium, is in white minute acicular crystals, soluble 1 in 34 of water. It is said to disturb the head less, as well as to derange the stomach and bowels less, than the other salts.

Liquor Morphinæ Bimeconatis, B.P. 1885.

Dose.—5 to 40 minims (0·3 to 2·4 Cc.).

Morphine (pure Alkaloid) 14½ grains, Meconic Acid 12 grains, Alcohol (90%) 1 ounce. Mix and add Distilled water to 4 ounces.

One ounce contains about 5½ grains or 1¼% of morphine bimeconate, is about the same strength as tincture of opium. Pills contain ¼ grain.

Tablets, Hypodermic, contain $\frac{1}{8}$ and $\frac{1}{4}$ grain (0·008 and 0·016 Gm.).

Morphinæ Sulphas, U.S. $(C_{17}H_{19}NO_3)_2H_2SO_4+5H_2O$=752·84 (U.S. 752·83; 758·54 I. Wts.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.).

In white silky acicular crystals. Soluble 1 in 23 of water, very slightly in alcohol 90%.

Hypodermic Tablets contain $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ and 1 grain; also combined with Atropine as follows:

Morphine Sulphate	$\frac{1}{8}$,	$\frac{1}{8}$,	$\frac{1}{6}$,	$\frac{1}{4}$,	$\frac{1}{4}$,	$\frac{1}{3}$,	$\frac{1}{2}$,	$\frac{1}{2}$ gr.
Atropine Sulphate	$\frac{1}{200}$,	$\frac{1}{150}$,	$\frac{1}{180}$,	$\frac{1}{200}$,	$\frac{1}{150}$,	$\frac{1}{120}$,	$\frac{1}{120}$,	$\frac{1}{100}$ gr.

Liquor Morphinæ Sulphatis, B.P. 1885.

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Morphine Sulphate 1, Rectified Spirit 25, Distilled Water to 100. A preparation known as **Magendie's**

Solution of morphine used in the United States contains 16 grains in the ounce. Magendie's Solution in France is weaker than that of the United States; it contains 1 part of morphine acetate in 37½.

Pills of Morphine Sulphate contain ¼ grain.

Pulvis Morphinæ Compositus, U.S.

Average dose.—7½ grains (0·5 Gm.).

Morphine Sulphate 1·5, Camphor 32, Glycyrrhiza 33, Precipitated Calcium Carbonate 33·5.

Morphinæ Tartras, Morphine Tartrate. (*Off.*)

$(C_{17}H_{19}NO_3)_2.\begin{matrix}CH.OH.COOH\\CH.OH.COOH\end{matrix}3H_2O = 768{\cdot}66$ (774·48 I. Wts.).

Dose.—⅛ to ½ grain (0·008 to 0·032 Gm.).

In small white nodular tufts of acicular crystals, readily soluble 1 in 10 of water, slightly in alcohol 90%.

Injectio Morphinæ Hypodermica. (*Off.*)

Dose.—2 to 5 minims (0·12 to 0·3 Cc.).

Morphine Tartrate 5, Distilled Water (recently boiled and cooled) *q.s.* to 100.

Contains 1 grain in 22 minims. N.B.—Is slightly less than one-half the strength of the preparation bearing this name in B.P. 1885, *v.p.* 480.

In making this a small quantity of crystalline Morphine Acid Tartrate may separate.—P.J. i./03, 134,178.

Liquor Morphinæ Tartratis. (*Off.*)

Dose.—10 to 60 minims (0·6 to 3·5 Cc.).

Morphine Tartrate 1, Alcohol (90%) 25, Distilled Water to 100.

Uses of Morphine Salts.—General and most useful sedative and anodyne for all purposes, but may cause indigestion and constipation. Must be given with care to children. Is employed in diabetes, but Codeine is generally preferred.

Opium and morphine may poison infants through the mother's milk; see a case in B.M.J. ii./85,1159.

Dionin, Ethyl-Morphine Hydrochloride.

$C_2H_5.C_{17}H_{18}NO_3.HCl.H_2O = 364{\cdot}94$ (367·698 I. Wts.).

Morphine contains one alcoholic and one phenolic OH. In this body the H of the phenolic is replaced by C_2H_5.

Dose.—¼ to ½ grain (0·016 to 0·032 Gm.).

A white crystalline powder ***soluble*** about 1 in 10

of water and 1 in 8 of alcohol 90%. Insoluble in ether. Recommended to replace codeine and morphine in bronchitis, pulmonary emphysema, and bronchial asthma, also for whooping cough. May be used hypodermically in doses of $\frac{1}{10}$ gr. in 5 minims of water.

Dott found the solubility of "Dionine" to be 1 in 14 of water, and 1 in 29 of alcohol (90%). Our experiments, however, showed it to be more soluble. He found melting point 124° C. and a content of water $= 2H_2O$.

Introduced for the treatment of morphine habit. Produces no euphoria and consequently can be discontinued easily.—B.M.J.E. i./99,83; P.J. i./99,532d.

May cause "ophthalmic fireworks," pain, chemosis, swelling, and sneezing. Corneal ulcers have been cured by it.—M.P. Aug.1905; B.M.J.i./06,1098.

In interstitial keratitis with potassium iodide internally, and yellow precipitate ointment in the conjunctival sac.—B.M.J.ii./04,1303.

'Sterules' of Dionin are prepared for ophthalmic use of 5% strength; dionin is a useful anodyne in glaucoma, iritis, corneal ulcers, &c. Solutions may be from 1 to 5% strength or more.

Heroin Hydrochloride. **Diacetyl Morphine Hydrochloride.** $C_{17}H_{17}(OCH_3.CO)_2NO.HCl.$ $=402{\cdot}64$ (405·682 I. Wts.). The Hydrogen atoms of both the alcoholic and the phenolic OH groups are replaced by the $CH_3.CO$ groupings.

This body was first produced in London by Beckett and Wright, and not in Germany as has been stated.

Dose.—$\frac{1}{24}$ to $\frac{1}{6}$ grain (0·0028 to 0·01 Gm.).

In white crystalline powder, ***soluble*** about 1 in $2\frac{1}{2}$ of water and about 1 in 13 of alcohol 90%. Is incompatible with alkalis, *e.g.* Ammonium Carbonate, Sodium Bicarbonate, and acid, *e.g.*, dilute Hydrochloric Acid. Possesses in a greater degree the properties of codeine. Does not constipate so much as the morphine salts. Phthisical patients especially have been greatly benefited by it. Also of value in asthma and bronchitis, and will check irritable cough without narcotism. Possible Heroinomania on lengthy use must be guarded against.—Glas.Med.Jl., Dec.1905,465.

Useful in hay fever and acute coryza.

Solutions must not be acid, as acetic acid is apt to be split off.—P.J.i./04,4; B.M.J.i./04,708.

Recovery after 9 grains.—B.M.J.E. ii./02,31.

Tablets, Hypodermic, $\frac{1}{24}$ and $\frac{1}{12}$ gr.

Morphinum Diacetylicum, P. Austr. The base of the above salt. Insoluble in water.

Episine. *Dose.*—$\frac{3}{4}$ grain (0·05 Gm.). A synthetic derivative allied to Morphine; "Morphigenine Hydrochloride" is an intermediate product.—F.N.,1906,87.

Glycaphorm. *Syn.* GLYCEROLE OF DIACETYL-MORPHINE HYDROCHLORIDE, LINCTUS HEROIN.

Contains $\frac{1}{48}$ grain Diacetyl-Morphine Hydrochloride in 1 drachm of a vehicle consisting of Glycerin 3, Syrup of Roses 4, Water 1.

Dose.—1 to 2 drachms (3·5 to 7 Cc.).

This preparation forms a useful linctus for coughs, and is employed in bronchitis, pertussis, laryngitis, asthma, and similar disorders.

Glyco-Heroin.

Dose.—1 drachm (3·5 Cc.) repeated; children 15 to 30 minims (1 to 3 Cc.) or less.

A proprietary article. Is given for coughs.

Peronin. Benzoyl-Morphine Hydrochloride.

$C_{17}H_{17}NO < {}^{OH}_{O(C_6H_5CH_2).HCl}$ = 408·61 (411·698 I. Wts.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.).

A whitish powder, soluble in water 1 in 200 approximately, and in 90% Alcohol about 1 in 150, insoluble in chloroform or ether; a mild sedative and analgesic, for asthma, coughs, phthisis, rheumatism, and neuralgia.

A 5% solution causes deep anæsthesia when applied to the eyes.—B.M.J.E. ii./99,71; B.M.J. i./99,675.

MULLS.

Plaster Mulls consist of soft rubber adhesive plaster basis, spread on strong muslin. On the upper surface is a coating of large mesh muslin which is to be removed

Plaster Mulls—*continued.*

before applying the plaster. Should the covering adhere too firmly moisten a little. Plaster Mulls measure 1 metre by 20 centimetres and are medicated with a large variety of substances for various skin affections. They must be preserved in a cool dry place—particularly to be preserved from direct sunlight.

No.	Ingredients	Contents in Gm. per one-fifth square metre.	No.	Ingredients.	Contents in Gm. per one-fifth square metre.
2	Acid boric. ...	10	15	Hydrarg.	20
82	,, salicyl. ...	50	83	Hyd. precip. alb.	10
9	,, ,, ...	25	16	Hydrarg.	20
10	,, ,, ...	10		Acid. carbol. ...	7·5
64	Acid. salicyl. ...	20	88	Hydrarg.	20
	Ext. cannab. ind.	5		Acid. carbol. ...	10
78	Acid. salicylic ...	20		Hydrarg. perchlor	2
	Creosote	40		Zinci oxidum ...	10
76	Ac. salicyl. ...	10	17	Hydrarg.	20
	Creosote	20		Zinci oxidum ...	5
79	Ac. salicyl. ...	30	66	Ichthyol	10
	Creosote	50	11	Iodoform	10
81	Acid. salicyl. ...	50	7	Pyrogallol ...	10
	Creosote	50	72	Resorcin	15
98	Acid. salicyl. ...	10	87	Resorcin	5
	Resorcin	10		Hyd. perchlor. ...	1
5	Chrysarobin ...	10	24	Zinc ox.	10
6	,, ...	2	74	Zinc ox.	10
68	Ext. bellad. ...	10		Ichthyol	5

Paraplasts are impermeable caoutchouc coatings (one sided) on cotton of much closer texture than the plaster mulls, and are, therefore, firmer and tougher than the latter. No. 255 (Hydrargyri 50%, Acid Carbolic 7·5%), No. 259 (Zinci Oxidum 40%). A number of other formulæ are prepared.

Leucoplast is the name given to a rubber plaster containing a proportion of Zinc Oxide spread on pink cotton. It is popular on spools.

No. 522 is 2½ Cm., No. 523 is 3¾ Cm., No. 524 is 5 Cm. each 5 metres long, No. 527 is 2½ Cm. 10 metres in length.

Salve Mulls, stiff ointment bases (benzoated lard and wax) medicated, spread on muslin. A large number of similar preparations are made :—

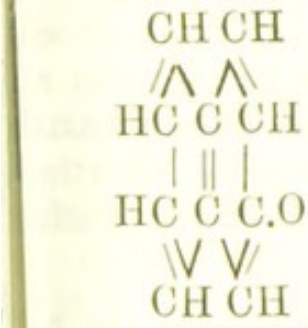
No.	Ingredients.	1 sided	2 sided
		Gm.	Gm.
15*	Acid boric	10	10
2	Emp. plumbi ... ... } Acid. carbolic ... ... }	5	10
17	Ichthyol	10	10
11	Zinc oxide	10	10
12	,, ,, ...	10	20
	Mercuric oxide	5	5
18	Zinc oxide	10	10
	Ichthyol	2	2

Tricoplasts, lead plaster (no rubber) spread on tricot especially suggested for eczema, *e.g.*, Acid Salicylic 2·5%, also compounds with Mercury 20%, Oleum Rusci 10%, Tumenol 10%.

NAPHTHOL.

Beta-Naphthol. (*Off.*) P.G. iv., P. Belg., BETA-NAPHTOL, U.S.; BETA-NAPHTOLUM, P. Austr.

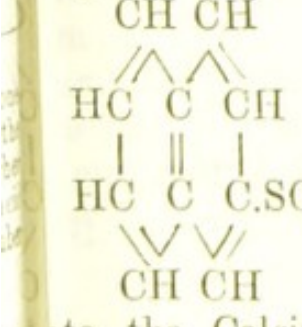
BETA-MONO-HYDROXY-NAPHTHALENE.



or $C_{10}H_7OH = 142·98$ (B.P. & U.S. Wts.) (144·064 I. Wts.)

Dose.—3 to 10 grains (0·2 to 0·65 Gm.) in cachet.

β-Naphthol is prepared by heating Naphthalene which is obtained by cooling the 180° to 220° C. fractions of the distillation of coal tar) with strong Sulphuric Acid at 170° to 180° C., β-Naphthalene Sulphonic Acid being formed. This is converted firstly



or $C_{10}H_7SO_3H = 206·56$ (208·124 I.Wts.)

into the Calcium $(C_{10}H_7SO_3)_2Ca = 450·83$ (454·332

* Add 1,000 (*e.g.*, 1,015, &c.) to these numbers if one-sided Mulls required, or 2,000 if two-sided.

† Contents in ½ sq. metre (1 m. × 20 cm.).

I. Wts.) and then the Sodium Salt, $C_{10}H_7SO_3Na$ = 228·44 (230·166 I. Wts.). By treatment at 300° C. with Sodium Hydroxide this is converted into Sodium Naphtholate, $C_{10}H_7ONa$ = 164·86 (166·106 I. Wts.), which is ultimately decomposed with Hydrochloric Acid, forming β-Naphthol and Sodium Chloride. β-Naphthol has a faint storax odour; when sublimed is in white shining laminar crystals; ***soluble*** in alcohol 1 in 2, ether 3 in 4, chloroform 1 in 24, and 1 in 24 benzol; 1 in 12 of olive oil and lard, and 1 in 80 of vaseline. Addition of boric acid increases solubility in water.

Naphthol has the advantage in skin diseases generally of being odourless and colourless.

Uses.—Internally, in enteric fever; safe and efficient, but sometimes causes too much gastric disturbance. In dilated stomach, dyspepsia and other disorders. In cholera, as preventive, and in treatment of early stages; and it is inhaled in pharyngitis, catarrh, and bronchitis, and used as a vermifuge,.

It is a powerful antiseptic and germicide. In advanced scabies, an ointment of 10 to 15% cures the eczema as well as destroys the parasite, but the **Compound Ointment** (Kaposi's Ointment) is preferred:—Naphthol 15, Lard 100, Green Soap 50, Prepared Chalk 10. Useful also in psoriasis.

Naphthol 5, Alcohol 100, Glycerin 10, is a remedy for hyperidrosis of palms, soles, and axillæ.

Pilula β-Naphthol, 3 and 5 grains.

Tablets, 3 grains each.

α-Naphthol

= 142·98 (144·064 I. Wts.).

is said to have greater antiseptic power, but given internally causes more irritation.

A solution of 5 grains in a quart of water is used to wash out the intestines by rectal injection.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Acidum α-Oxynaphthoicum. *Syn.* NAPHTHOL CARBONIC ACID. $C_{10}H_6.OH.COOH = 186·65$ (188·064 I. Wts.).

Dose—¾ to 3 grains (0·05 to 0·2 Gm.).

Is in reddish masses, soluble in alcohol, benzole and volatile oils. Has an antiseptic and antipyretic action, and sternutatory property. Ointment (10%) is used for scabies, prurigo, and some other skin affections.

Alphol

$C_6H_4(OH)CO.OC_{10}H_7(\alpha) = 262·11$ (264·096 I. Wts.).

Is isomeric with Betol, *q.v.*

Dose.—8 to 30 grains (0·52 to 2 Gm.), in cachet.

Salicylic ether of α-naphthol, in whitish powder, insoluble in water, soluble in alcohol. Resembles betol and salol in effects on articular rheumatism and cystitis.

Benzonaphthol. — *Syn.* **Benzoyl - Naphthol.**

$C_{10}H_7OOC : C_6H_5 = 246·23$ (248·096 I. Wts.).

Dose.—4 to 10 grains (0·26 to 0·65 Gm.), in cachet or suspended in mixture. A white crystalline powder, obtained by the action of benzoyl chloride on β-naphthol. Soluble in alcohol and chloroform. Is a powerful intestinal antiseptic and diuretic, *e.g.* in typhoid. May usefully be combined with bismuth salicylate.

Tablets, 5 grains, to be dissolved in a little water.

Asaprol. *Syn.*—**Abrastol.**

$[C_{10}H_6(OH)SO_3]_2Ca + 3H_2O = 536·23$ (540·380 I. Wts.)

Dose.—10 to 30 grains (0·65 to 2 Gm.). A calcium salt of β-naphthol-sulphonic acid; a whitish powder freely soluble in water and alcohol; incompatible with most alkaline and alkaloidal salts, potassium iodide, and antipyrine, an antipyretic and antiseptic; useful in acute articular rheumatism, and for influenza with high temperature. Asaprol as a test for albumen (*v.p.* 828).

Eikonogen.

$NH_2.C_{10}H_5(OH).SO_3Na + 2\frac{1}{2}H_2O = 303·96$ (306·254 I. Wts.). Sodium-amido-β-naphthol-δ-monosulphonate, a photographic developer.

Epicarin. *Syn.* **Epicarinum purum.**

A condensation product of β-Naphthol and Cresolic

Acid, used for psoriasis, eczema, scabies, unbroken chilb'ains, and tinea circinata in a 10% or 20% Ointment. For seborrhœa capitis a 5% alcoholic solution with 15% of Ether is useful.

Microcidine.

A non-poisonous whitish powder, prepared by fusing β-naphthol with caustic soda. Soluble 1 in 3 of water; solution 1 in 200 or 300 is used as antiseptic lotion.

Naphthol cum Camphora. Naphthol Camphor.

β-Naphthol 1, Camphor 2, mix to form a viscid liquid, miscible with oils. It is a powerful (but in some instances toxic) antiseptic.

Improvement in 32 cases of tuberculous adenitis, also in three of tuberculosis of testis, treated by interstitial injections of naphthol camphor.—B.M.J.E. ii./91,125.

10,000 injections without grave results. On the other hand 12 deaths reported.—L.ii./04,1893; P.J.i./05,177.

Betol. *Syn.* **Naphthalol.**

$C_6H_4 \left\{ \begin{matrix} OH \\ CO.OC_{10}H_7\ (\beta) \end{matrix} \right\} = 262{\cdot}11$ (264·096 I. Wts.).

Dose.—3 to 8 grains (0·2 to 0·52 Gm.) in cachets or pills, or suspended in almond emulsion or milk.

The salicylate of β-Naphthol-ether. In small tasteless white crystals, insoluble in water, soluble in alcohol. Useful in rheumatism, cystitis, and intestinal catarrh.

Bougies of Betol 1 part, cacao butter 4 parts, have proved useful in gonorrhœa; of any length up to 6 inches, and in six diameters, *see* Bougies, *p.* 182.

Cachets of Betol 5 grains, with 5 grains of bismuth salicylate, useful as an intestinal disinfectant. Is contra-indicated in cases associated with renal disease.

Naphthalene. *Syn.* **Naphthalinum, P.G. iv., U.S. Naphtalinum, P. Austr.** $C_{10}H_8 = 127{\cdot}1$ (B.P. & U.S. Wts.) (128·064 I. Wts.).

Dose.—2 to 15 grains (0·13 to 1 Gm.) in cachets.

Pilula Naphthalini, 3 grains.

A hydrocarbon formed in large quantities in the manufacture of coal gas. In shining white crystalline plates (melting point 60° C.) with persistent odour.

Soluble in Ether 1 in 3, in Alcohol 1 in 25, in fats, in Olive Oil 1 in 8, in Chloroform 1 in 1½, insoluble in water. May be given in Malt Extract.

Uses.—As an intestinal disinfectant for the diarrhœa of consumption, and of typhoid and for dysentery. It acts only on the mucous membrane of the bowels; 8-grain enemata are useful. Is painless in action, and promotes healing of ulcers. Given internally with success to lessen fœtor of urine and stools. Used as a vermifuge in tænia and ascarides. A 10 to 20% solution in oil is successful as a parasiticide in scabies, but does not relieve the secondary eruptions. The vapour inhaled for whooping cough is useful.

Suppository and ointment for pruritus ani.—M.A. 1906,410.

Moulded into blocks or sticks, it is sold under various trade names, such as Alabastrine, for preventing moths; Camphylene, for disinfecting urinals and stables; and Albo-carbon ("Carbon" in Lamp trade), for increasing the luminosity of gas.

A Precipitated Form is also made by adding an alcoholic solution to water. For use as a dusting powder diluted 1 in 10.

Naphthalene Tetrachloride.—*Syn.* NAPHTHALIN HYDROCHLORIDE, $C_{10}H_8Cl_4$ = 267·86 (269·864 I. Wts.). *Dose.*—3 to 12 grains (0·2 to 0·8 Gm.), in cachets or pills. White crystals, melting at 182° C., insoluble in water.

NARCEINA.

$C_{23}H_{27}NO_8,3H_2O$=495·55 (499·304 I. Wts.).

Dose.—$\frac{1}{8}$ to 1 grain (0·008 to 0·065 Gm.), in a pill.

A crystalline alkaloid, with slight bitter taste, obtained from opium, soluble 1 in 400 of water, very soluble in alcohol, insoluble in ether. It is a soporific, produces less headache and perspiration than morphine, and checks cough of pertussis.

Narcyl. Ethyl-Narceine Hydrochloride.

$C_{25}H_{31}NO_8.HCl$ = 505·92 (509·746 I. Wts.).

Dose.—1 grain per day; hypodermically, $\frac{1}{6}$ to $\frac{1}{3}$ grain.

White crystals. Analgesic, slightly stimulant, not hypnotic. Melting point 205 to 206° C.

Soluble 1 in Water 120 at 15° C. Sodium benzoate and citric acid increase the solubility. Should be tried as anæsthetic and antispasmodic.—P.J. i./05,177.

NARCOTINA.

$C_{19}H_{14}(O.CH_3)_3NO_4 = 410{\cdot}12$ (413·224 I. Wts.).

Syn. ANARCOTINE.

Dose.—1 to 3 grains (0·065 to 0·2 Gm.) or more in a pill with glycerin of tragacanth.

An alkaloid from opium (sometimes as much as 15 % of), in white crystals, insoluble in water, soluble 1 in 3 of chloroform, 1 in 100 of 90% alcohol, 1 in 125 of ether, soluble also in benzol. Possesses antiperiodic properties, has been given in ague. It is a spinal irritant producing convulsions.

Narcotine resembles morphine in action, but is much weaker. In pulmonary tuberculosis.—L. ii./04,1526.

Thebaine, $C_{17}H_{15}(O.CH_3)_2NO = 308{\cdot}87$ (311·208 I. Wts.), more closely resembles strychnine than morphine.—B.M.J. i./91,157.

Bromocodeinone prepared from Thebaine by treating with a solution of bromine in glacial acetic acid.—J.C.S.A., April 1906,303.

Cotarnine Hydrochloride. *Syn.* **Stypticin.**

$$CH_2\!<\!\begin{matrix}O\\O\end{matrix}\!>C_6H(O.CH_3)\!<\!\begin{matrix}COH\\CH_2-CH_2-NH.CH_3,HCl\end{matrix} = 271{\cdot}57\ (273{\cdot}618\ \text{I. Wts.}).$$

Dose.—$\frac{1}{4}$ to $\frac{1}{2}$ grain (0·016 to 0·032 Gm.) internally or hypodermically.

The salt of an opium base in primrose-coloured granular crystals, very soluble in water and alcohol. Is allied to Hydrastinine, *q.v.* Recommended in all forms of uterine hæmorrhage.—P.J. ii./95,471; B.M.J.E. i./96, 7; i./98,27,71; ii./98,104.

Erysipelas, eczema and shingles may be treated with a 5% ointment.

Tablets of Cotarnine, $\frac{3}{4}$ grain (0·05 Gm.).

Stypticin Wool, 30% and **Gauze** are made.

Urethral Bougies of Cotarnine in cacao butter or gelatin contain $\frac{1}{2}$ grain (0·03 Gm.), four inches long, and $\frac{1}{8}$ inch in diameter, are used to check bleeding caused by sounds or catheters.

Cotarnine Phthalate. STYPTOL.

$$(C_{12}H_{15}NO_4)_2.C_6H_4\!\begin{cases}COOH\\COOH\end{cases} = 635{\cdot}56\ (640{\cdot}369\ \text{(I. Wts.)}.$$

An orange red body soluble in water. Contains 73 % Cotarnine. **Styptol Tablets** $\frac{3}{4}$ grain (0·05 Gm.).

In gynæcological hæmorrhage.—B.M.J.E. ii./03,36; ii./04,12. Three grains dissolved in 35 minims of water can be injected subcutaneously to arrest hæmorrhage and pain.—B.M.J. i./05,311.

NEBULÆ.

These are solutions for application to the throat and nose by the aid of a fine spray apparatus or atomiser. By means of a metal or vulcanite tube, a jet of fine spray may be directed into the pharynx or nares, and if a deep breath be taken at the proper moment some of the spray will enter the larynx. The patient must be taught to carry this out personally. Nebulæ are aqueous, or of Liquid Paraffin, Almond Oil or Olive Oil. The following indications may prove useful;—

Antiseptic, Healing and Demulcent.—**Nebula Alkalina**, *q.v.*

Antiseptic and Soothing.—(*a*) **Nebula Acidi Borici**—Glycerin of Boric Acid 1 drachm to the ounce; (*b*) **Nebula Potassii Permanganatis**, *q.v.*; (*c*) **Nebula Acidi Tannici**—Glycerin of Tannic Acid 40 minims, Rose Water to 1 ounce.

Analgesic.—**Nebula Cocainæ Oleosa**, or **Nebula Cocainæ Aquosa**, *q.v.*

Asthma.—(*a*) **Nebula Anti-asthmatica** "**Compound Asthma Fluid**" *q.v.* and (*b*) **Nebula Lobeliæ Composita**—Lobelia Tincture, Belladonna Tincture, Stramonium Tincture, of each 10 minims, Ipecacuanha Tincture 5 minims, Pyridine 1 minim, Sodium Nitrite 10 grains, Glycerin and Rose Water to 1 ounce. (The pyridine is, however, rather objectionable in taste.)

Astringent.—(*a*) **Nebula Zinci Chloridi**, *vide* Index; (*b*) **Nebula Cupri Sulphatis**, 5 grains to the ounce; (*c*) **Nebula Ferri Perchloridi**, *q.v.*

Diphtheria.—To dissolve membrane, **Nebula Acidi Lactici**, *q.v.*

Catarrh, Nasal, and congestive state of the Eustachian tubes.—**Nebula Cocainæ Composita**—Cocaine 2 grains, Cinnamon Oil 5

minims, Menthol 15 grains, Liquid Paraffin to 1 ounce. **Nebula Resorcini** 1% aqueous solution for a common cold.—B.M.J.ii./05,1679; *vide also p.* 631. **Nebula Antipyrini** 3%.

Catarrh, Dry. — (*a*) **Nebula Eucalypti**—Eucalyptus Oil 20 minims, Liquid Paraffin to 1 ounce; and (*b*) **Nebula Eucalypti Composita**, *q.v.*

Hay Fever.—(*a*) **Nebula Suprarenalis Extracti** 5% and 10%; (*b*) **Nebula Quininæ Antiseptica**—Quinine Hydrochloride 30 grains, Carbolic Acid 8 grains, Glycerin and Rose Water to 1 ounce.

Phthisis.—(*a*) **Nebula Creosoti Composita**—Creosote 5 minims, Cassia Oil 5 minims, Almond Oil to 1 ounce; (*b*) **Nebula Iodi Composita**—Iodine 2 grains, Carbolic Acid 8 grains, Menthol 5 grains, Camphor 2 grains, Liquid Paraffin to 1 ounce. 2% Creosote may be added (if made with Almond Oil).

Stimulant.—(*a*) **Nebula Menthol**, *q.v.*; (*b*) **Nebula Menthol Composita**—Menthol and Camphor, of each 20 grains, Cinnamon Oil 5 minims, Liquid Paraffin to 1 ounce.

Tonic.—(*a*) **Nebula Pini Composita**, containing Pine Oil, Eucalyptus Oil, Cassia Oil, of each 5 minims, Menthol 5 grains in Almond Oil 1 ounce; also (*b*) the same, with Cocaine 1%.

For further formulæ, consult Index.

NICCOLUM.

NICKEL, Ni = 58·7 (I. Wts.)

This metal is a constituent of German Silver:—Nickel 2, 3 or 4, Copper 8, Zinc $3\frac{1}{2}$. The nickel coins in Germany consist of Copper 3, Nickel 1.

Niccoli Bromidum, Nickel Bromide, $NiBr_2 + 3H_2O = 272·668$ (I. Wts.)

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Manufactured by neutralising Nickel Carbonate with Hydrobromic Acid. Green deliquescent crystals very soluble in water. Soluble in alcohol.

Physiological action same as that of Potassium Bromide. To be given diluted, or in effervescing draught.

In epilepsy, pills containing 1 grain each.

Niccoli Bromidum Effervescens.

Dose.—1 drachm, containing Nickel Bromide 3 grains.

Syrupus Niccoli Bromidi.

Dose.—1 drachm (4 Cc.).

Nickel Bromide 10, Water 120, Glycerin 15, Sugar 250. Dissolve.

Niccoli Sulphas. $NiSO_4,7H_2O$=(280·872 I.Wts.).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) after meals.

Greenish crystals, very soluble in water.

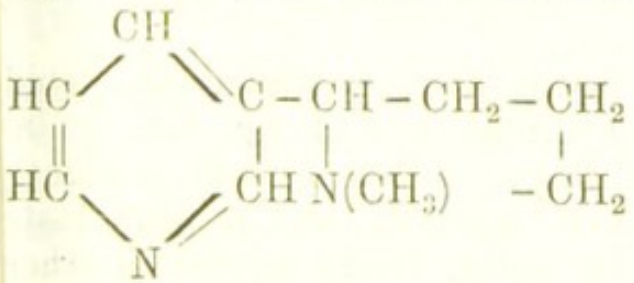
Has been employed in chlorosis (like iron augmenting number of blood corpuscles), amenorrhœa, splenic enlargement and in locomotor ataxy.

Resembles zinc sulphate in the fact that it is a nervine tonic and astringent. It has been found to allay nervous excitement and pain, particularly useful in cases where opiates cause vomiting, headache and skin itching.

Other Nickel Salts suggesting themselves for therapeutic trial are:—Nickel Arsenate $Ni_3(AsO_4)_2.8H_2O$ = 598·228 (I. Wts.); Nickel Acetate $Ni(C_2H_3O_2)_2$, $4H_2O$ = 248·812 (I. Wts.), soluble in water; Nickel Benzoate $Ni(C_7H_5O_2)_2$ = 300·78 (I. Wts.) + aq.; Nickel Chloride $NiCl_2$, $6H_2O$ = 237·696 (I. Wts.), solution in water makes "Sympathetic Ink"; Nickel Cyanide $Ni(CN)_2$ = 110·78 (I. Wts.); Nickel Iodide NiI_2 = 312·64 (I. Wts.) soluble in water; Nickel Phosphate $Ni_3(PO_4)_2$, $7H_2O$ = 492·212 (I. Wts.).

NICOTINA.

Syn.—Pyridyl-methyl-Pyrrolidin.



or $C_{10}H_{14}N_2$ = 160·98 (162·192 I.Wts.).

Dose.—⅙ to 1 grain (0·01 to 0·065 Gm.).

A colourless volatile liquid alkaloid, obtained from tobacco—*Nicotiana Tabacum*, Sp. Gr. 1·011. Darkens

with age, has a strong, disagreeable odour, soluble in water, more so in alcohol and ether.

Tetanizes the heart; has been highly praised for tetanus. Many recorded cases appear to show its usefulness in this disease. Is an antidote to strychnine.

Bad effects of smoking due not only to Nicotine but to carbon monoxide, pyridine and a volatile oil containing a phenol.—P.J. i /01,459, *ex* Schweiz. Woch., 39, 27.

Method of testing to distinguish between Nicotine, Conine and Sparteine.—P.J. ii./05,333.

Antidotes.—Acid Tannic, Nux Vomica and Strychnine, after emetics or stomach pump, then stimulants.

Nicotine Salicylate, Eudermol.

$C_{10}H_{14}N_2.C_6H_4OH.COOH = 297{\cdot}99$ (300·140 I. Wts.).

In yellowish-white granular crystals, freely soluble in water; 1 per cent. in ointment of lard, soft paraffin, olive oil, or traumaticin effective in treatment of sycosis. Scabies cured by 6 applications. Inodorous, does not soil linen.—P.J. i./99,227; B.M.J.E. ii./99,47.

X.L. All Vaporizing Fumigator. Is a mixture containing Nicotine, Camphor and Alcohol. Vaporised is effective as an insecticide for plants. Lysoform sponged on is equally effective and non-poisonous. 'X.L. All Insecticide,' containing 4% of Nicotine caused death.—P.J. ii./04,375.

NITROGLYCERINUM.

$C_3H_5(O.NO_2)_3 = 225{\cdot}47$ (227·16 I. Wts.).

Syn. TRINITROGLYCERIN; GLONOIN; TRINITRIN; GLYCERYL TRINITRAS.

Dose.—$\frac{1}{200}$ to $\frac{1}{50}$ grain (0·00032 to 0·0013 Gm.) increased to $\frac{1}{10}$ grain.

This nitrate is a dense, opaque, white, oily liquid, transparent when dehydrated, and of Sp. Gr. 1·600. It drops in very small drops. It has no odour, is slightly volatile, and has a sweet, aromatic, and pungent taste. It is slightly soluble in water, freely soluble in ether, 1 in 6 of almond oil, freely soluble in absolute alcohol, and 1 in 15 of 90% alcohol. Nitroglycerin in fatty or oily solution is perfectly safe and stable.

Uses.—Especially valuable in angina pectoris and

generally to relieve dyspnœa of cardiac, pulmonary, or renal origin.

Nitroglycerin, in two minutes after taking a dose, accelerates the pulse, relaxes the arteries, produces a feeling of fulness all over the body, but particularly in the head by a throbbing at the sides of the temples. It also causes headache, which lasts from 15 minutes to several hours, according to the quantity taken; but to patients accustomed to its use the headache is not felt. In treating angina pectoris, neuralgia, asthma, headache, sea-sickness, and Bright's disease, its action is like that of amyl nitrite aud the other nitrites, but its effects last much longer. For the weak heart of fatty degeneration and of old persons, this lessened tension proves valuable.

Hale White states that *physiologically* it belongs to the class of nitrites—probably, therefore, sodium nitrite is formed directly it gets into the blood.

Dixon expresses the same opinion and states maximum dilatation occurs in 4 or 5 minutes and main effect over in 20 minutes.

The circulation is distinctly affected by even $\frac{1}{1000}$ grain.—D. J. Leech, 1903.

Strychnine, Ergot and Belladonna are recommended to counteract the headache produced by large doses.

Injectio Nitroglycerini Hypodermica.

Dose.—1 to 4 minims (0·06 to 0·24 Cc.).

Nitroglycerin Solution 5, Alcohol (90%) 2, Distilled Water to 12.

Contains about $\frac{1}{240}$ grain in 1 minim. Acts promptly; useful in collapse, &c., when the patient cannot swallow.

Tablets, Hypodermic, $\frac{1}{250}$ and $\frac{1}{100}$ gr.

Liquor Nitroglycerini, 1%. *Made official as*

Liquor Trinitrini (*Off.*). **F.E.**

Dose.—$\frac{1}{2}$ to 2 minims (0·03 to 0·12 Cc.) gradually increased to 10 minims, if necessary, every 3 or 4 hours, in any aqueous vehicle.

Trinitroglycerin	...	1 part by weight.
Alcohol (90%) *q.s.* to	...	100 fluid parts.

Dissolve. Sp. Gr. 0·840. 110 minims contain 1 grain. A colourless neutral liquid; 10 Cc. with an equal volume of water keeps clear, but the further

admixture of 1 Cc. of water causes opacity (presence of full proportion of trinitroglycerin). Diluted further, the latter separates in oily drops, which explode when struck with a hammer. Should be kept from sunlight. A 5% and a 10% solution in absolute alcohol are also prepared commercially, but are not safe for use in dispensing. (**Spiritus Glycerylis Nitratis, U.S.**, has 1% by weight.) **U.S.** cautions that violent headache may be caused when freely applied to the skin. A little caustic potash solution should be poured over it to decompose should it be accidentally spilled.

Incompatibility.—Nitroglycerin is decomposed by caustic alkalies. The alcoholic solution is also precipitated by water in excess.

Haustus Nitroglycerini vel **Trinitrini. Vict. Park.** *Dose.*—$\frac{1}{2}$ to 1 ounce.

Solution of Trinitrin 1 minim, Spirit of Chloroform 15 minims, Compound Tincture of Cardamoms 20 minims, Water to 1 ounce.

Oleum Nitroglycerini, 1% in almond oil.

Dose.—1 to 2 drops or more on sugar. Recommended as being more stable than the alcoholic solution.

Capsules (gelatin) of Nitroglycerin.

Dose.—1 or 2. Contain $\frac{1}{100}$ gr., or more or less as prescribed, in stable solution.

Pilula Nitroglycerini.

Is made with a theobroma-oil basis to contain $\frac{1}{100}$ to $\frac{1}{50}$ grain or more.

Tabellæ Nitroglycerini, B.P. 1885.

Introduced by the late William Martindale in 1878; $\frac{1}{100}$ grain in each. These tablets have the nitroglycerin in solution in chocolate, $2\frac{1}{2}$ grains, in a perfectly safe and inexplosive, stable and non-volatile, portable and palatable form. The small bulk, precise dose, and quick action, if well masticated and swallowed, render this mode preferable for administering nitroglycerin. *Dose.*—1 or 2.

Box-wood pocket cases for the tablets are convenient.

Additional Strengths of Tabellæ.

The tablets are also prepared containing $\frac{1}{75}$, $\frac{1}{50}$, and $\frac{1}{25}$ grain, and 1 milligramme respectively, for those accustomed to their use, as well as $\frac{1}{200}$, $\frac{1}{400}$, and $\frac{1}{800}$ grain

in each, for administration to ladies, delicate persons and children, for whom this is a sufficient dose to ward off sea-sickness. The tablets appear to be non-poisonous even to children; a surgeon records that on one occasion two children, one three and the other six years of age, ate between them straight away two dozen, $\frac{1}{100}$ grain in each, without any injurious effects.

An employé in the author's laboratory (1905) ate a piece of the nitroglycerin mass weighing about 2 ounces, mistaking it for ordinary chocolate. A bad headache supervened, necessitating his lying down, but he was at work again the following day.

Single doses of 5 grains and *daily dose* of 20 minims of Pure Nitroglycerin tolerated.—B.M.J.E. ii./05,52.

Uses of Nitroglycerin Tablets.—One tablet every three or four hours to relieve or ward off attacks of angina pectoris, asthma, sea-sickness, neuralgia, headache, epilepsy, and may be tried for Bright's disease and dysmenorrhœa. A dose of any preparation of nitroglycerin acts more promptly if taken on an empty stomach.

Fifty per cent. of cases of sea-sickness are benefited by the nitroglycerin tablets.—B.M.J. ii./93,596.

Nitroglycerin tablets should be taken when the patient is threatened with an attack of asthma; or, if the attacks occur in the night, at bedtime, or whenever the patient wakes.—B.M.J. ii./81,424,543.

Tabellæ Trinitrini, Trinitrin Tablets (*Off.*).

Tablets of chocolate, each weighing 5 grains (0·324 Gm.), and containing $\frac{1}{100}$ grain (0·00065 Gm.).

These *Official* tablets are now double the weight of those in B.P. 1885, and as first manufactured by W.M. This dilution diminishes value as a remedy of prompt action. *Dose.*—1 or 2, *vide* Tabellæ Nitroglycerini, *ante.*

The ordinary lozenges of commerce are unreliable, as they do not contain the proper amount of the drug.—M.A. 1906,37; but the tabellæ with chocolate and fat basis are accurate and lasting.

Tabellæ Nitroglycerini Compositæ, W.H.

Contain Nitroglycerin $\frac{1}{100}$ grain, Amyl Nitrite $\frac{1}{5}$ grain, Menthol $\frac{1}{50}$ grain, Capsicum $\frac{1}{100}$ grain.

Tabellæ Anti-Asthmaticæ. (H.)

Dose.—1 to 4 thrice daily.

Nitroglycerin $\frac{1}{200}$ grain, Sodium Iodide 2 grains,

Potassium Bromide 2 grains, Fluidextract of Euphorbia Pilulifera 3 minims, Tincture of Lobelia 4 minims.

Very useful in asthma; the nitroglycerin depresses the peripheral ends of the vagus nerves, and stimulates the heart by removing the inhibitory action of the vagus and relieving blood vessels elsewhere.

References to use of Nitroglycerin.

Bright's disease, acute and chronic, and in vascular tension of the aged, 1 to 3 minims of the 1% solution was successful.—B.M.J. ii./80,803; L. i./06,1028.

Myxœdema, case of, treated successfully with $\frac{1}{50}$ grain doses with elaterium purgings.—L. i./82,440.

Puerperal convulsions, $\frac{1}{100}$ grain every hour arrested in 4 or 5 doses.—B.M.J. i./82,573.

In epileptic vertigo, 1 to 2 minim doses of 1% solution quite relieved.—Pr. xxx.105.

Angina pectoris gravior, treated with nitroglycerin tablets and amyl nitrite, prompt relief.—B.M.J.i./06,304.

In uræmic asthma, $\frac{1}{100}$ grain doses thrice daily, was useful.—B.M.J. i./83,811.

On account of its stimulating effect on the heart and blood vessels, is recommended as a substitute for alcohol where brandy is indicated; dose is small and tasteless and its action is almost immediate. Useful in collapse from chloroform, or typhoid and other fevers, shock from accidents, and nausea and faintness from surgical operations.—L. ii./85,257.

In nephritis, it increases the amount of urine, lessening the albumin.—L. ii./85,733; B.M.J. ii./98,1047.

Its administration relieves morphine craving.—L. i./87, 1278; i./90,1334.

Paroxysmal headaches much improved and made less frequent.—L. ii./87,1135; i./88,1195 (tablets used).

In tinnitus aurium, doses of $\frac{1}{100}$ grain found useful.

Poisoning by eating two 'bobbins' of dynamite, which would be about 4 inches long by $\frac{3}{4}$ inch diameter.—L. ii./88,1102.

Nitroglycerin the most reliable agent in angina, more especially graver cardiac cases.—Pr. xlvi.253; M.C. May,1891,132; L. i./90,240; B.M.J. ii./91,982; and given with morphine.—L.ii./05,325.

Nitroglycerin has the advantage over amyl nitrite that it can be more readily used to keep up a steady diminution in blood pressure—chocolate tablets the best method—one to be broken up small and a piece taken every 10 or 15 minutes. Thus the action is never very great, but is constant.—Pr. xlvii.259.

Gallstone colic immediately relieved by Nitroglycerin tablets.—L. i./96,353.

Dose in tablets may in exceptional cases be increased to $\frac{1}{4}$ grain with safety and advantage.—L.ii./96,634.

Use in various forms of cardiac pain.—L. ii./99,1249.

Senile restlessness completely relieved by $\frac{1}{100}$ grain tablets.—B.M.J. ii./99,1542.

Paroxysmal tachycardia, nitroglycerin and amyl nitrite the treatment.—B.M.J. ii./04,109.

In typhoid fever Nitroglycerin $\frac{1}{100}$ grain, with Strychnine $\frac{1}{100}$ grain from two to four times in the 24 hours, beginning about the tenth day and continuing to the convalescent week, useful stimulant. In some instances digitalis or strophanthus in place of strychnine.—Med. News, July 23, 1904.

Quinine-amblyopia (due partly to excessive smoking) cured by Nitroglycerin.—B.M.J. ii./05,384.

Gangrene of the hand, severe case, successfully treated by Nitroglycerin Tablets, $\frac{1}{100}$ grain. The case is stated to have been a recovery from local death to life. Amputation of two fingers was, however, necessary, otherwise recovery complete. Should prove of great value to the surgeon in all cases of impaired circulation in which contracted arterial walls are present.—B.M.J. i./05,16.

In hæmoptysis.—B.M.J.i./06,917.

Cordite, which contains Nitroglycerin 58, Gun-cotton 37, and Mineral Jelly 5%, has been taken from army rifle cartridges and eaten by soldiers, and produces violent headache, and in some cases leads to attacks of mania.—B.M.J.ii./03,925; L.ii./03,1137. May have been taken for malingering.—L.ii./03,1324.

NUX VOMICA (*Off.*).

Antidotes. *See* **Strychnine.**

Dose.—1 to 4 grains (0·065 to 0·26 Gm.) in powder.

The dried ripe seeds of *Strychnos Nux-vomica*

(*Loganiaceæ*), imported from India and Ceylon, contain from 0·7 to 1·5% of Strychnine.—P.J. ii./00,574. Farr & Wright find 1·0 to 1·5%.—P.J. July 28,06, *p.* 83.

A minute quantity of copper is said to be present in the seeds, and this may colour mixtures made with Tincture of Nux Vomica and Sal Volatile a bluish green shade.—Correspondence, C.D. ii./05.

U.S. standardises to 1·25% Strychnine. (B.P. not standardised except in preparations.) *U.S. Assay.*—Nux Vomica 20 Gm. in No. 60 powder is shaken with a mixture of Ether 137·5 Cc., Alcohol 13·5 Cc., Chloroform 44 Cc. and Ammonia 5 Cc., and allowed to stand 12 hours; 100 Cc. is decanted and shaken with repeated amounts of Normal Sulphuric Acid. Chloroform and Ammonia are added, and the mixture shaken and Chloroform drawn off. Chloroformic solution is evaporated and residue dissolved in warm Sulphuric Acid, and when cooled Nitric Acid is added and the solution is shaken with Chloroform in the presence of excess of Soda. The Chloroformic solution is evaporated and the residue dissolved in $\frac{N}{10}$ Sulphuric Acid and back-titrated with $\frac{N}{50}$ Potassium Hydroxide in usual manner, using Iodeosin as indicator, the factor 0·0532 being employed to obtain percentage of Strychnine. (1 Cc. $\frac{N}{10}$ Acid = 0·03317 Gm. Strychnine.)

Alkaloidal strength of powdered drug should be 2·5% C.U.D. —total alkaloid. A standard of Strychnine would be better.

Methods of assay and results.—P.J. i./03,426; Y.B.P. 1903,158,160,161. That of U.S. satisfactory—Farr and Wright. —P.J. July 28,06, *p.* 83.

Bird's method modified for dry Extract.—P.J. ii./05, 864.

A menstruum of Amyl Alcohol 1, Chloroform 3, and Ether 4 is a useful solvent for the alkaloids in assaying.—P.J. ii./00,574. A little Amyl Alcohol added to the Strychnine residue prevents decrepitation in drying.

Naylor favours a method based on Bird's or Alcock's process, concluding with Dowzard's Nitric Acid method of separating the two alkaloids.—P.J. ii./05,125.

Composition of Nux Vomica Fat constituting about 4% (Greenish finds 2·6 to 4·7%, *see p.* 503). It contains high percentage of unsaponifiable matter and great variation of free acid, from 56·7 to 6·9 calculated as Oleic Acid.—P.J. ii./05,223.

Uses.—A bitter stomachic and tonic. Stimulates the bowels, hence added to aperients. Increases nervous energy. Given to relieve shock and collapse from anæsthetics. Is employed in dyspepsia, heart weakness, and as a general tonic in all conditions of debility and neurasthenia.

In China for hydrophobia.—L. i./04,1341.

Extractum Nucis Vomicæ (*Off.*).

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.).

Is prepared from the liquid extract by distilling off

the alcohol and adjusting the strength by the addition of milk sugar so that it contains 5% of strychnine.

U S. is a liquid acetic extract precipitated from inert matter with alcohol, dried, adjusted to 5% Strychnine, and powdered. *Average dose.*—¼ grain. Assay method, *see p.* 502.

C.U.D. suggested making with Alcohol 70% and alkaloidal strength 15%; this refers to total Alkaloids, and is not as good as B.P.

Extractum Strychni, P. Austr., Ph. Ned. and **P. Belg.**, contains 16% alkaloids.

In the official process for estimating the liquid extract which may be employed also for the solid extract, 2 hours is sufficient for the precipitation of the Strychnine Ferrocyanide if the temperature be kept at 65° to 70° F. In cold weather the Strychnine Ferrocyanide is not properly freed from the Brucine Salt by washing.—P.J. ii./00,214.

Extractum Nucis Vomicæ Liquidum (*Off.*).

Dose.—1 to 3 minims (0·06 to 0·18 Cc.).

Prepared by percolating the seeds in No. 20 powder with Alcohol (70%), and adjusting the strength so that the extract contains 1·5% of Strychnine. A "blunder."—P.J., July 28, 06, *p.* 85.

By filtering the weak percolate in the official process, after evaporating to ⅓ of its volume, the fat (2·6 to 4·7% in the seeds) is removed. This will produce a tincture which will not deposit in the cold. A No. 20 powder is the most suitable.—P.J.ii./01,667,672.

Fluidextractum Nucis Vomicæ, U.S.

Average dose.—1 minim.

Aceto-alcoholic, contains 1% Strychnine.

Tinctura Nucis Vomicæ (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.), often less.

Liquid Extract of Nux Vomica 2, Distilled Water 3, Alcohol (90%) *q.s.* to 12. This contains not less than 0·24 or more than 0·26% of strychnine. One ounce contains about one grain, or about double the quantity contained in the Tincture of B.P. 1885.

C.U.D. suggested strength 0·25% and to be prepared with Alcohol 70%. This is for total alkaloids. A figure for Strychnine would be more satisfactory.

U.S. 1 in 50 of Alcohol (94·9% vol.) and water in the proportion of 750 and 250. Strychnine 0·1%.

Ph. Ned. frees seeds from fat with petroleum ether 0·25% alkaloids. Removal by a paraffin cake.—P.J., July 28, 06, *pp.*86,115.

Tablets equal 5 and 10 minims of the tincture.

Tinctura Ignatiæ.

Dose.—3 to 20 minims (0·18 to 1·2 Cc.).

From St. Ignatius' Beans, the seeds of *Strychnos Ignatii* (*Loganiaceæ*) (allied to Nux Vomica), 1 part, and a mixture of 90% Alcohol 3 and Water 1, *q.s.* to produce 10 parts. A preparation known as **Gouttes Amères de Baumé** (Codex), is of strength 1 in 2. *Dose.*—1 to 8 minims (0·06 to 0·48 Cc.).

Extractum Ignatiæ Amaræ Liquidum.

Dose.—1 to 10 minims. Standardised to contain 2% of Alkaloids by weight.

Powdered Extract of Ignatia of commerce contains 10% Alkaloids.

OLEATA.

Acidum Oleicum, Oleic Acid (*Off.*).

$CH_3(CH_2)_7CH:CH(CH_2)_7COOH$=280·14 (B.P. and U.S. Wts.) (282·272 I. Wts.).

A pale-sherry-coloured oily liquid (at ordinary temperatures) with a slight odour, is faintly acid. ***Solubility,*** readily in 90% alcohol, ether, chloroform, benzol, and fixed oils; insoluble in water; it dissolves most metallic oxides, thus forming indefinite oleic solutions of oleates in an excess of Oleic Acid; such combinations of bismuth, copper, lead, mercury, and zinc are used medicinally; they are soluble in oils, fats, and petroleum ointments. Those of mercury and zinc are most in request; the former is now officially made by the double decomposition of Mercuric Chloride, and the latter of Zinc Sulphate with Hard Soap, forming incorrectly called 'true' oleates, which are less satisfactory than those made by the direct combination with the oxides. Oleic Acid also dissolves alkaloids, but not their salts, *e.g.* Oleate of Aconitine (*see* Aconitina, *p.*77), Oleate of Atropine (*see* Atropina, *p.*158), Oleate of Morphine (*see* Morphina, *p.*479), and Oleate of Veratrine (*see* Veratrina, *p.*714), are used medicinally. One part of Quinine (alkaloid) dissolved by 3 of Oleic Acid forms **Oleatum Quininæ** (**U.S.**), which is applied externally and is readily absorbed, and 8 grains (= 2½ grains of Quinine) added to one ounce of cod liver oil forms **Oleum Morrhuæ cum Quinina** for rubbing on to the skin prior to X-ray treatment. Oleic Acid is much more

readily absorbed by the skin than oils. It also aids the absorption of drugs with which it is combined.

No oily drops should separate from Oleic Acid mixed with equal volume of Alcohol (absence of fixed oils U.S.).

To prepare pure Metallic Oleates.—Caspari recommends the preparation of (*a*) Sodium Oleate and (*b*) Potassium Oleate Solutions in place of ordinary Soap solutions. (*a*) Warm 1217 grains Oleic Acid to 60°C. and add slowly 192 grains Sodium Hydroxide (90%) dissolved in a mixture of 2 ounces Distilled Water and 6 drachms of Alcohol, stirring constantly until acid neutralised (use Phenolphthalein Solution). Dissolve finally in 3 pints of water and filter. (*b*) Neutralise 410 grains Potassium Bicarbonate with 1156 grains Oleic Acid in 1 pint of water by boiling. When cold make up to 3 pints. To 1 pint of (*a*) add Lead Acetate crystallised 137½ grains, Copper Sulphate 90 grains, Zinc Sulphate 103½ grains, Mercuric Nitrate 118½ grains, or to (*b*) Lead Acetate crystallised 129½, Copper Sulphate 85 grains, Zinc Sulphate 98½ grains, or Mercuric Nitrate 112½ grains, each dissolved in ½ pint of water to produce the corresponding pure Oleates.

Capsules of Oleic Acid, contain 7½ minims.

These are given for hepatic colic, and to hinder the formation of gall stones one or two are taken daily—best in the morning on an empty stomach.

Oleanodyne.

A special preparation combining the alkaloids aconitine, atropine, morphine, and veratrine, with oleic acid. It is rapidly absorbed, and forms a strong anodyne liniment, which can be diluted with chloroform, alcohol, or oils. It is not so compatible with compound camphor or soap liniment.

Cupri Oleas, Copper Oleate.

$(C_{17}H_{33}COO)_2Cu = 621{\cdot}40$ (626·128 I. Wts.). (Theoretical formula for Pure Oleate.)

May be prepared by the double decomposition of a hot solution of copper sulphate, 3 in 8 of water, added to a hot solution of Castile soap 8 in 32, washing and drying the pasty precipitate. When cold it is in solid dark-green masses. It is an oleo-palmitate of copper. Soluble in ether.

Unguentum Cupri Oleatis, U.C.H.

Copper Oleate 1, Lard 7. Melt together. May be made by using vaseline as the basis, and for some purposes it may be employed half the above strength.

Is specially useful in ringworm—lightly rubbed in night and morning,—for indolent ulcers, warts and corns, and is recommended for removing freckles.

Aluminii Oleas. $Al_2(C_{17}H_{33}CO.O)_6$ (approximate composition) = 1728·64 (1741·784 I. Wts.).

Dissolve separately Hard Soap (containing about 60% fat acid) in powder 30 and Aluminium Trisulphate with 16 H_2O (*see p.* 114) 6½ in suitable quantities of water. Mix the solutions and wash the precipitate. Suggested as possible substitute for some of the other oleates in skin affections.

Hydrargyri Oleas, Mercuric Oleate (*Off.*).

Hard Soap, in powder, 16, Oleic Acid 1. Mix, dissolve in boiling Distilled Water 88, and add Mercuric Chloride 8, dissolved in boiling Distilled Water 80. Boil the mixture for 10 minutes, decant, and wash the deposited mercuric oleate with hot distilled water until free from chlorides. Dry it on a water-bath. Is indefinite, being an oleo-palmitate. Is liable to turn brown.

The method in B.P. 1885 by acting on Mercuric Oxide with Oleic Acid gave better results, *v. infra.*

Unguentum Hydrargyri Oleatis (*Off.*).

Mercuric Oleate 1, Benzoated Lard 3.

Hydrargyri Stearas, Mercuric Stearate.

$(C_{17}H_{35}COO)_2Hg$=761·08 (766·56 I.Wts.). Theoretical formula.

A stiff white unctuous paste formed by the interaction of mercuric chloride and curd soap. Its other properties resemble those of the official mercuric oleate.

Emplastrum Hydrargyri Stearatis.

Lead Plaster 6, melt and add Mercuric Stearate 2. Is a useful substitute for mercurial plaster, and for strapping up joints requiring Mercurial treatment.

Emplastrum Hydrargyri, U.S.

Triturate Mercury 30, with Oleate of Mercury (U.S.) 1, and add Hydrous Wool Fat 10. Incorporate lead plaster to 100.

Oleatum Hydrargyri, B.P. 1885. 10%,—*i.e., of Mercuric Oxide employed to make it.*

Yellow Mercuric Oxide 1, Oleic Acid 9. Into the acid, kept agitated in a mortar, sprinkle the oxide gradually, and stir frequently during 24 hours, until the latter is all dissolved and a light brown unctuous jelly is formed. Contains a large amount of free Oleic Acid.

U.S. has Yellow Mercuric Oxide 25, Water 25, Oleic Acid *q.s.* to 100.

Oleatum Hydrargyri (10%) **cum Morphina.**

Morphine (base) 1, is dissolved in 60 of the above. Linimentum Hydrargyri Oleatis cum Morphina, R.O.H., is similar. For use where the plain Oleate causes pain.

Oleatum Hydrargyri, 5% (liquid). An efficient means of introducing mercury into the system.

Is prepared with one-half as much oxide as the 10% and when ordered with morphine, 1 part is added to 60 parts of the oleate when dispensed. These preparations do not keep well with the morphine in combination. The 10% is always dispensed unless one of the others is specially ordered. They should be applied with a brush without much friction.

Uses of Mercuric Oleate Preparations. For syphilis in secondary and tertiary stages. The application does not salivate unless used in excessive quantity. In persistent inflammation, especially of glands, and joints (such as synovitis), and in non-ulcerated syphiloderma, the Oleates of Mercury are much more active, definite, and cleanly, than the mercurial ointment. They are very effective parasiticides for pediculi.

Oleatum Hydrargyri cum Sulphure.

Mercuric Oleate 5% ('85 B.P.), 4, Precipitated Sulphur 1, Ether 3. For pediculi pubis.

Syphilitic Disease of the Nervous System.—It is not advisable to give Potassium Iodide and Mercury together in full doses, except in a very urgent case. A drachm of the 10% oleate should be rubbed in near the affected part twice daily for three or four days, and then once daily for remainder of the week; near the scalp if in the brain, and down the back if in the spinal cord; treatment to be brief, to last eight weeks or so, and be renewed after two, four or six months.—Gowers, B.M.J., i./03,773.

Cases of ringworm have been cured by 5% to 10% Oleate. It is a certain, painless remedy, produces no stain, and it destroys the fungus, as it readily permeates the sebaceous glands, hair follicles, and even the hairs themselves. Its penetrating power may be increased by adding one-eighth of acetic ether.

It is also found useful in alopecia areata.

Emplastrum Plumbi. *Syn.* DIACHYLON PLASTER.

Lead Plaster *(Off.)* is a crude Oleate of Lead, made by the combination of olive oil (oleate and palmitate of glyceryl) and oxide of lead heated together in the presence of water. Thus made, the oleate is more adhesive than when prepared by the oleic acid solution of the oxide.

U.S. makes this by precipitating a solution of soap 100 in 350 of hot water with a solution of lead acetate 60 in warm water 250.

This is used as an abortifacient in the Midland Counties with some success.—B.M.J., i./05,584,653; i./06,456.

Lead taken by the mother reaches the fœtal circulation and may cause hydrocephalus.—B.M.J.i./06,257.

Diachylon poisoning: Treatment by potassium iodide, opium, and bismuth.—B.M.J.,i./06,259.

Emplastrum Resinæ, Adhesive Plaster (*Off.*) is lead plaster with the addition of resin and soap;, **Emplastrum Saponis** is similar, with less resin and is therefore less adherent. U.S. contains no resin

Is Soap 10 with Lead Plaster 90, and Water *q.s*

Emplastrum Adhesivum, U.S., contains no resin.

Melt Rubber 20, at not exceeding 150° C. (302° F), add Petrolatum 20, and heat until rubber is dissolved. Add Lead Plaster 960, and then strain.

Plasters, spread:

Adhesive, on unglazed calico, 16 inches wide, any length; also 6 inches wide, 6 yard rolls.
Adhesive, on union, 6 inches wide.
,, on dimity, 16 inches wide.
,, Tapes, holland and pliable, ¼, ½, 1, 1½, and 2 inches wide; length, 6 yards.

The following ointments are prescribed for eczema, excessive perspiration of the feet, &c.

Unguentum Diachyli (original formula).

Olive Oil 60 parts, Boiling Water 128 parts; heat, and add gradually, Litharge in powder 15 parts. Continue the heat, adding more water if necessary, and stir constantly till combined, and until cold. Then add Oil of Lavender 1 part. In cold weather an extra ounce of oil should be allowed for every pound of ointment. It should be rubbed in 1 to 3 times a day, or spread on linen and applied as a plaster. Modified as

Unguentum Plumbi Oleatis, U.C.H., Unguentum diachylon, P.G.iv.

Lead Plaster and Olive Oil, equal parts (by weight), melted together.

U. S. has Lead Plaster 50, melted and mixed with Olive Oil 49, and Lavender Oil 1 added (freshly prepared).

Ceratum Plumbi Subacetatis, U. S. Lead Subacetate Solution 20, Wool Fat 20, Paraffin 20, White Petrotatum 38, Camphor 2.

Unguentum Diachyli, B.S.H.

Lead Plaster 1, Vaseline (Soft Paraffin, yellow, G.H.) 1.

Melt together and stir till cold. Made thus, the oint-

ment keeps well, and does not acquire a disagreeable odour. Kaposi has adopted this, when perfumed with oil of bergamot, as *Unguentum Vaselini Plumbicum.*

With the addition of 2% of phenol this ointment forms *Unguentum Diachyli Carbolisatum* (Lassar).

Oleatum Zinci, B.P. 1885.

Zinc Oxide 1, Oleic Acid 9. Mix and heat together till combined. Diluted with an equal quantity of Soft Paraffin, was **Unguentum Zinci Oleati** (B.P. 1885).

Unguentum Zinci Oleatis (*Off.*).

Precipitated Zinc Oleate (see below) 1, Soft Paraffin, white, 1. Melt together and stir till cold. For some cases further dilution with vaseline is advisable. This ointment, having the zinc in solution, has the advantage over zinc ointment B.P., in most cases in which the use of this is indicated, in not coating the sore, to which it is applied, with a crust of débris, which checks healing and irritates the part on removal.

In making the official ointment **press** the oleate dry rather than heat on water bath.—P.J. i./02,175.

Chronic eczema is curable with this ointment.

Unguentum Oleatorum, G.H.

Zinc Oleate Ointment 2, Diachylon Ointment 2, Mercuric Oleate Ointment 2.

Zinci Oleas.—*Syn.* ZINC OLEO-STEARATE.

$(C_{17}H_{33}COO)_2Zn = 623.19$ (627·928 I. Wts.).

Theoretical formula for the Oleate.

Hard Soap in shavings 16, Boiling Water 120; apply heat till dissolved. [If made with a soap the fatty acid of which has a fairly high melting point, 44° C. or thereabouts, *c.f.* *p.*643, the product keeps better.] Zinc Sulphate 8, Boiling Water 16; dissolve and add to former solution; stir well, separate the water from the Oleate, and wash the latter with hot water till free from sulphate, cool, and dry. Reduced to powder is useful for dusting on eczematous surfaces and parts troubled with excessive perspiration. It may be perfumed by the addition of $\frac{1}{500}$ of thymol, and diluted with kaolin or starch. It is *the* remedy for hyperidrosis and osmidrosis.

OLEUM CROTONIS (*Off.*).

Syn. Oleum Tiglii, U.S.

Dose.—½ to 1 minim (0·03 to 0·06 Cc.).

The oil expressed from the seeds of *Croton Tiglium*

(*Euphorbiaceæ*). Sp. Gr. 0·940 to 0·960 (*Off.*). Saponification No. 212 to 218, U. S. Iodine value 102 to 105. ***Soluble*** in Ether and in Olive Oil.

A powerful irritant to the skin, will blister and even cause suppuration and scarring.

It has been found possible to immunise animals to the poisonous effects of Croton Oil by gradual increasing dosage of 'Crotin.'—Bosanquet.

Alder Smith employs the oil for tinea either as treatment alone, or as additional to the "X" ray treatment (to "finish off" at the spots left by the latter). The only cure is to eradicate the hairs and produce alopecia.

Linimentum Crotonis. (*Off.*) Croton Oil 1, Cajuput Oil $3\frac{1}{2}$, Alcohol 90% $3\frac{1}{2}$.

The liniment, well diluted, may stimulate the growth of hair on bald patches.

Internally, Croton Oil is so violent a purgative, that it is rarely given except to lunatics for obstinate constipation, and in cases of apoplexy (one or two drops placed on the back of the tongue). May be given as **Compound Castor Oil Capsules**, *v.p.*515.

Antidotes.—Olive oil or milk as diluent. Opium to relieve pain and irritation.

OLEUM GYNOCARDIÆ, I.C. Add.

Chaulmoogra Oil.

Dose.—5 to 10 minims (0·3 to 0·6 Cc.), increased to 1 drachm (3·5 Cc.) in capsules, cod-liver oil, or milk.

The oil (constituting about 30%) expressed from the seeds of *Gynocardia odorata*,* imported from India. It has a pale brownish colour and a disagreeable taste and smell. It is always solid and unctuous in this climate, as it contains a quantity of palmitic acid, with three other fatty acids; of these **Gynocardic Acid** $C_{14}H_{24}O_2$ = 222·50 (224·192 I. Wts.) is supposed to be the active ingredient—a 'mixture' (for constitution *see* P.J. i./04, 831; i./05,856); this causes it to give a reddish-brown coloration, changing to green with sulphuric acid. *Dose.*—$\frac{1}{2}$ to 3 grains (0·032 to 0·2 Gm.). The

* Or *Taraktogenus* (*Hydnocarpus*) *Kurzii* (*Bixaceæ*). The oil is probably from various plants.—N.S.D.

oil is applied externally, and given internally *after meals* for leprosy, phthisis, scrofula, marasmus, psoriasis, and lupus. For chronic rheumatism and rheumatic gout it forms a useful application with gentle friction. For phthisis 2 to 4 ounces should be rubbed into the chest weekly.

Applied to raw surfaces, however, causes great pain.

For leprosy it is better to give half-an-ounce per rectum daily so as to avoid irritation of the stomach.

Gynocardic Acid has also been used internally for leprosy with good results.—B.M.J.E. i./92,28.

The Oil is said to be from *Hydnocarpus Spec.* Description.—L. ii./05,982. Constituents.—P.J.i./05,856. A query regarding use in syphilis.—L.ii./05.498.

Gynocardin. A new crystalline cyanogenetic glucoside (5% of the seeds) yielding Hydrogen Cyanide equalling 0·44% of the seeds splits up under action of Gynocardase, a ferment.

Capsules of Gynocardia Oil contain 5, 10 and 20 grains.

Unguentum Gynocardiæ, I.C. Add. *v.p.* xxvii.

Hard Paraffin 4, Soft Paraffin 5; melt and add Gynocardia Oil 1; stir till cold.

OLEUM MORRHUÆ (*Off.*).

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

The oil is separated from the livers of codfish, *Gadus Morrhua* (*Teleostei*), by means of steam at a temperature not exceeding 82° C. It is then cooled to a temperature of 5° C. and the liquid portion, producing the "non-freezing" oil of commerce, is pressed through canvas. Inferior brands are prepared by heating.

To cover the taste may be taken with a little salt, Worcester Sauce, in steel or orange wine, coffee or milk.

Sp. Gr. (Parry) 0·924—0·931 includes all genuine samples.

Unsaponifiable Matter. Good quality oil rarely exceeds 1·6%; use full excess of alkali before extraction; wash Ethereal Extract at least 4 times (Parry).—C.D. i./05,492.

Free Fatty Acid calculated as Oleic should not exceed 1%, easily estimated. Many samples fall below 0·5%.

Iodine Number 155 to 170 (Hübl's Solution 18 hours). —P.J. ii./04,477. C.D. ii./04,577; i./05,129,491. — *Vide also* Aspari,

Soluble, in 2 of Ether, slightly in Absolute Alcohol, soluble in Chloroform.

Uses.—Nutritive, nervine tonic given in rickets, phthisis, chronic bronchitis, general debility and malnutrition.

Capsules contain ½ or 1 drachm. *Dose.*—1 or more.

Capsules of Cod Liver Oil 19 minims **and Creosote** 1 minim are for use in phthisis.

Capsules of Cod Liver Oil (½ drachm) with **Blaud Pill** (4 grains),—Ingredients, Sodium Carbonate and Ferrous Sulphate 2 grains each. A satisfactory method of giving iron—the ferrous carbonate is in *statu nascendi*.

Emulsio Olei Morrhuæ (50%). (Martindale). *Dose.*—2 to 8 drachms (7 to 30 Cc.).

Soak Irish Moss 2 drachms in Water 12 ounces, six hours, boil and strain off 10 ounces, add Simple Tincture of Benzoin 1 ounce, Alcohol 90% 1 ounce, Essential Oil of Bitter Almonds 10 minims, Elixir of Saccharin 10 minims. Allow to cool and add in three portions Cod Liver Oil 12 ounces. This produces a much whiter preparation than that of the B.P.C., made with eggs and tragacanth powder, which is now omitted. (For formula *see* Extra Pharm. Edn. XI., *p.* 378.)

U.S. has Cod Liver Oil 500, Acacia 125, Syrup 100, Oil of Gaultheria 4, Water to 1,000, or may be flavoured with Oil of Bitter Almonds or other suitable flavouring.

Ferrated Emulsion of Cod Liver Oil consists of the plain Emulsion with Citrate of Iron and Ammonium 5 grains per ounce.

For **Emulsion of Cod Liver Oil with Glycerophosphates**, *v.p.* 51.

Emulsio Olei Morrhuæ et Hypophosphitum. *Dose.*—2 to 8 drachms (7 to 30 Cc.). Contains Hypophosphites of Sodium and Calcium, of each 1%, in the form for **Emulsio Olei Morrhuæ** above.

We find this to be a permanent Emulsion which does not separate. Experiments with Acacia produced a white Emulsion, but not so permanent.

U.S. contains Calcium Hypophosphite 1%, Potassium and Sodium Hypophosphites of each 0·5%.

Oleum Morrhuæ Aromaticum. *Dose.*—1 to 4 drachms.

Coumarin 0·01, Saccharin 0·5, Vanillin 0·6, Absolute

Alcohol 10·0, Lemon Oil 20·0, Peppermint Oil 3·0, Cod Liver Oil to 1,000. The taste is covered but the odour persists to some extent.

Lofotol is Cod Liver Oil charged with carbon dioxide (effervescent); said to be less prone to oxidation and rancidity; palatable and digestible.—B.M.J.ii./02,1657; L. ii.02,1703.

Cod Liver Oil Substitutes. *See* **Maltolivine, Marrubin, Oleum Olivæ cum Acido Oleico, Mistura Olei Olivæ.**

Dermosapol. A superfatted soap made with Cod Liver Oil 50%, Peruvian Balsam, Glycerin, Wool Fat and Alkali. Is medicated with Potassium Iodide or Mercury, Iodoform, Formaldehyde, &c.

Oleum Jecoris Aselli cum Benzoate Ferrico, Ph. Ned.—FERRATED COD LIVER OIL. Contains not less than 0·14% Fe, also WITH FERROUS IODIDE 1·3 %.

OLEUM OLIVÆ. (*Off.*)

Dose.—¼ to 1 ounce (7·5 to 30 Cc.).

The oil expressed from the ripe fruit of *Olea europæa* (*Oleaceæ*).

Tests.—Inferior brands are obtained by addition of the pulped fruit to boiling water and by fermentation processes.

U.S. provides tests for Cotton-Seed and Sesame Oil. It gives Saponification No. 191 to 195 and Iodine Number not less than 80 or more than 88.

Halphen's Test for Cotton-Seed Oil.—Shake 3 Cc. of the oil with an equal volume of fusel oil after the addition of 1 Cc. of sulphur in carbon bisulphide (1% solution). Heat cautiously in water bath for half-an-hour. In the presence of cotton-seed oil a beautiful red colour makes its appearance in a few minutes, the intensity of which is roughly proportional to the amount present.

Sulphuric Acid Test.—To 20 drops of oil placed in the lid of a porcelain crucible add two drops of concentrated H_2SO_4 and note appearance before and after stirring:—Olive oil, before stirring, yellow, green or pale brown; after stirring, light brown or olive green. Rape oil, crude, before stirring, green with brown rings; after stirring, light green turning brownish. Rape oil, refined, before stirring, yellow with red and brown rings; after stirring, brown. Hydrocarbon oil (petroleum lubricating), before stirring, brown; after stirring, dark brown with blue fluorescence.

Nitric Acid Test.—Agitate 5 Cc. of the oil with an equal measure of HNO_3 of 1·30 specific gravity and note coloration, and appearance after heating for five minutes and after

standing 12 to 18 hours. Olive, rape, sesame and cotton-seed oil, &c., all behave differently.—B.& C.D. i./06,549.

Uses.—Olive Oil is a nutrient and has laxative properties (*vide* Keratin-coated Capsules). It is frequently used as rectal injection, as much as 10 ounces at bedtime for constipation.—L. ii./04,943.

Often gives relief to patients who have gall stones.

In typhoid tablespoon doses *per os*, and a breakfast cupful by the bowel daily gives great relief.—B.M.J. i./05,414.

Capsules (Gelatin) of Olive Oil, containing ½ and 1 drachm.

These capsules are also prepared **Keratin-coated** for lubricating the intestines in cases of habitual constipation.

Oleum Olivæ cum Acido Oleico.—*Syn.* LIPANIN.

Dose.—1 to 2 drachms (3·5 to 7 Cc.)

An addition of 5% of Oleic Acid to Olive Oil is recommended to render the oil more easily assimilated—to replace cod liver oil. Is flavoured with essential oil of almonds.

Olive oil in ½ to 2-ounce doses has been recommended for the treatment of gastric ulcer. It is said to inhibit the secretion of hydrochloric acid. Hyperchlorhydria is generally associated with gastric ulcer. The oil may be administered by the stomach tube if necessary, or in the form of **Mixture** or **Capsules**, or as **Oleum Olivæ cum Acido Oleico** above.

Hypophosphites may with advantage be given at the same time; or iodine or one of its salts if alterative influence desired.—H.

Mistura Olei Olivæ. *Dose.*—1 to 2 ounces.

Olive Oil 1 ounce, Tragacanth Powder 25 grains, Simple Syrup ½ ounce, Water to 4 ounces.

Maltolivine.

Dose.—2 to 4 drachms (7 to 14 Cc.).

A combination of Olive Oil and Malt Extract. Is recommended as a substitute for Cod Liver Oil. Is palatable, cheap, and of considerable value as a nutrient in marasmus, rickets, and emaciated and wasting conditions in children.

In colitis of children, olive and cod liver oil are beneficial.—L. i./06,94.

OLEUM RICINI. (*Off.*).

Dose.—1 to 8 drachms (3·5 to 30 Cc.).

Expressed from seeds of *Ricinus communis* (*Euphorbiaceæ*). ***Soluble*** 1 in 5 of Alcohol 90%. Also soluble in ether and glacial acetic acid. Sp. Gr. 0·950 to 0·970. U.S. has Saponification No. 179 to 180, Iodine No. 86 to 89. The seeds, but not the oil, contain the poisonous proteid Ricin. The purgative action is due to the fatty acids of which ricinoleic is a principal member. From an examination of the literature it is not clear whether ricinoleic acid has been obtained in the pure state, and that it is the only purgative acid—there must be other undiscovered members of the series.—P.J. ii./05, 137,170.

Total acidity expressed as oleic acid should not exceed 1%.—C.D. ii./04,1023.

Uses.—A mild but effectual purgative rarely causing pain. The oil rubbed on the breasts will often increase the flow of milk. Castor oil is a soothing application to the conjunctivæ, and is employed for making solutions of the alkaloidal bases (*q.v.*). In sprue 1½ drachms every morning.—Cantlie, B.M.J. ii./05,1281.

Capsules of Castor Oil contain ½ or 1 drachm.

Ph. Ned. has 3 Gm. in each or as ordered.

Capsules of Castor Oil, Compound, contain Croton Oil ¼ minim, with Castor Oil 8 minims.

Dose.—One or two.

Mistura Olei Ricini, Castor Oil Mixture. (*Off.*)

Dose.—1 to 2 ounces (30 to 60 Cc.).

Castor Oil 6, Mucilage of Gum Acacia 3, Orange Flower Water (undiluted) 2, Cinnamon Water 5.

To the mucilage contained in a mortar add alternately, in portions, the castor oil and the mixed waters, with constant trituration. An agreeable dose, the oil being made more active by emulsification. A mixture of tragacanth and acacia mucilage makes a thinner emulsion.—C.D. i./06,344.

In emulsifying oils in general proceed as for Castor Oil Emulsion or rub the oil with fresh mucilage and then add the menstruum in small quantities at a time. It is often preferable to rub the oil in a dry mortar with sufficient powdered acacia, then to dilute with water, *q.s.*

Enema.—Castor Oil 1, Olive Oil 5.

Oleum Ricini Aromaticum.

Dose.—1 to 8 drachms.

Vanillin 1 grain, Peppermint Oil 10 minims, Saccharin 4 grains, Absolute Alcohol 60 minims, Tincture of Cochineal 10 minims, Castor Oil 4 ounces. The taste of the oil is covered; is suitable for children.

Castor Oil Solutions of Alkaloids.

Uses.—Instillation of Castor Oil to the eye allays the irritation caused there by foreign bodies. The alkaloidal bases (not their salts) dissolved in Castor Oil are used in ophthalmic work. A 2% solution of the combined bases Homatropine and Cocaine has been of great service (*q.v.*). A 2% solution of Euphthalmine and 1% solutions respectively of Atropine, Cocaine (4% will dissolve), Duboisine, Gelsemine, Homatropine, Hyoscine, Hyoscyamine, Pilocarpine and Scopolamine have also been used. Physostigmine (Eserine) is used in ½% solution. Morphine is barely soluble in it to the extent of ½%.

Alkaloidal Oils are to be recommended because (1) they keep for months, (2) they furnish a most unfavourable medium for growth of micro-organisms and moulds, (3) do not irritate, (4) claimed not to set up dermatitis, as aqueous solutions have (Oph. 1905). They offer considerable advantages to country practitioners.—M.P. Aug. 9, 16, 23, 30, 1905.

Mistura Antiseptica, U.C.H.

Solution of Mercuric Chloride (*off.*) 1 minim, Castor Oil Mixture 1 drachm. For infantile diarrhœa.

Sodii Sulphoricinas,

$$C_{17}H_{32}\begin{cases}O.SO_3H\\COONa\end{cases} = 397{\cdot}36\ (400{\cdot}374\ \text{I. Wts.}).$$

Prepared by the action in the cold of sulphuric acid on castor oil, washing and nearly neutralising the product with soda, is used in the form of suppository as a purgative; ricinoleate of magnesium found unsatisfactory internally.—P.J. 1895,706.

Laxol. An American preparation said to consist of Castor Oil flavoured with Saccharin and Peppermint Oil.

Phenol Sodio-Sulphoricinate. A mixture of phenol and sodium sulphoricinate, is a yellowish brown thick syrup miscible with water. Used in 20 to 50% solution for papilloma and tuberculosis of larynx and ozœna.—P.J. ii./00,305; B.M.J. ii./04,1225.

Magnesii Ricinoleas.

A white powder, employed in several proprietary

preparations known as 'Castor Oil Powders.'—L. ii./05, 1339. Some Castor Oil Pills, however, contain Calomel without Oil.

Acute poisoning by a single Castor Oil Seed.—B.M.J. i./05,988.

OLEUM ROSÆ. (*Off.*, U.S.)

Syn. **Otto** (*Off.*) **or Attar of Rose.**

Distilled from the fresh flowers of *Rosa damascena* (3,000 yield 1). Sp. Gr. 0·856 to 0·860 at 86° F. Congealing and melting points should lie between 67° and 72° F. Mixed with an equal volume of chloroform it does not congeal and is convenient for use. Saponification value (U.S.) not less than 10 nor more than 17. It contains 70 to 75% of Geraniol $\begin{matrix}CH_3\\CH_3\end{matrix}>CH-CH_2-CH=CH-C(CH_3)=CH-CH_2-OH$ or $C_{10}H_{18}O=152{\cdot}98$ (154·144 I. Wts.) (three quarters of the liquid portion), and Citronellol $C_{10}H_{20}O=154{\cdot}98$ (156·16 I.Wts.) (the remaining 25%). The solid Stearoptene Rhodinol is odourless. Synthesis of Rhodinol.—J.C.S.A. i./1904, 756.

Aqua Rosæ (*Off.*).—*Syn.* **Eau de Rose.** *Dose.*—1 to 2 ounces (30 to 60 Cc.) of the diluted water. Should be diluted with twice its volume of distilled water immediately before use.

Liquor Rosæ Dulcis (Ph. Form.).

Otto of Rose 8 drops, Carmine 2 drachms, Potash Solution ½ ounce, Glycerin 1 ounce, Alcohol 90% ½ ounce, Syrup to 10 ounces. Useful for scenting and colouring pharmaceutical and toilet preparations.

Mistura Rosæ Laxativa, G.H. *Dose.*—1 ounce. Magnesium Sulphate 40 grains, Pimento Water 2 drachms, Acid Infusion of Roses to 1 ounce.

Pulvis Rosæ Compositus. *Dose.*—Ad libitum. Oil of Rose and Chloroform of each 1 (or combined 4 drops), Acacia 145 (grains), Sugar 840 (grains), Solution of Carmine 13 (drops). Useful as an agreeable diluent for powders such as Calomel, Grey Powder and Jalapin, also as a colouring and flavouring agent in mixtures—¼ or ½ ounce in 6 ounces.

Unguentum Aquæ Rosæ (*Off.*).—*Syn.* CERATUM GALENI; COLD CREAM.

White Beeswax 45, Spermaceti 45, Almond Oil 270. Melt together; add gradually, with constant stirring, Rose Water (*Eau de Rose*) 210, and while cooling, Oil of Rose ½, stir till cold.

U.S. has Spermaceti 25, White Wax 24, Almond Oil 112, Sodium Borate 1, Stronger Rose Water 38. When used as vehicle for Metallic Salts the Sodium Borate should be omitted.

Oleum Rosmarini (*Off.*).

A colourless or pale yellow oil. Distilled from flowering tops of *Rosmarinus Officinalis* (*Labiatæ*), Sp. Gr. 0·900 to 0·915. U.S. requires not less than 5% Ester calculated as Bornyl Acetate, and not less than 15% total Borneol.

Soluble 2 in 1 of Alcohol 90%. Internally is a carminative and externally promotes the growth of the hair.

Spiritus Rosmarini (*Off.*).

Dose.—5 to 30 minims (0·3 to 1·8 Cc.).

1 in 10 of Alcohol 90%. Carminative and flavouring.

OLEUM SANTALI. (*Off.*) P.G. iv., U.S.

With data as to Copaiba and Cubebs.

Dose.—5 to 30 minims (0·3 to 1·8 Cc.).

The oil distilled by steam under pressure from the wood of *Santalum album* (*Santalaceæ*), the yield being from 1 to 3%. A yellowish oil, with an aromatic odour and pungent taste. Consists principally of the alcohol Santalol $C_{15}H_{26}O$=220·53 (222·208 I. Wts.), but also contains a proportion of the Aldehyde Santalal $C_{15}H_{24}O$ =218·53 (220·192 I. Wts.). Sp. Gr. B.P. gives 0·975 to 0·980. Idris gives average of 0·979 to 0·981, but 0·974 to 0·982 may be taken as safe limits. According to U.S. must yield 90% alcohols (as Santalol). U.S. also tests for chloroform and other chlorinated products.

Soluble in all proportions in alcohol 90% (1 volume with 6 of alcohol 70% is clear-absence of Cedar Wood Oil, *Off.*). Readily in ether and chloroform.

Uses.—Internally in chronic bronchitis, *e.g.*, a few drops taken on a lump of sugar is found to relieve cough without expectoration. Is much employed in the treatment of gonorrhœa and gleet. It quickly checks the

discharge in dose of 15 minims 3 times a day, and with the use of iodoform and eucalyptus bougies gives good results ; also in 10-minim capsules, for chronic cystitis, with benzoic and boric acids as adjuvants.

Santyl, $C_{15}H_{25}C_6H_4.OH.COO = 339{\cdot}66$ (342·24 I. Wts.), **Salicylic Ester of Santalol.**

Dose.—15 to 30 minims (1 to 2 Cc.).

Yellow Oil with balsamic odour free from acrid taste. Does not irritate the stomach or kidneys; given for urethritis and cystitis.

Capsules of Santal Oil are prepared, containing 5, 10, 15 and 20 minims in each. **Gonal Capsules** are similar.

Those known as **Savaresse's Capsules** contain 10 minims, and are prepared with an animal membrane, and it is claimed are less nauseating, as they generally remain entire until they have passed the stomach.

Capsules of Copaiba contain 5, 10, and 15 minims; capsules of **Copaiba and Santal Oil** of each 5 minims; also **Oil of Cubebs and Santal Oil** of each 5 minims ; also **Copaiba and Cubeb Oil** of each 10 minims, and of each 5 minims.

Capsulæ Balsami Copaivæ, Ph. Ned. (unless otherwise ordered) 0·5 Gm.

Copaiba, the Oleo-Resin, *Off.* U.S.

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Is obtained from the trunk of *Copaifera Langsdorfii* and other species (*Leguminosæ*), and is imported from the northern coast of South America. ***Soluble*** almost completely 1 in 1 of Alcohol 90%, almost entirely in Absolute Alcohol, Ether, and in four times its volume of Petroleum Ether. ***Uses.***—Diuretic and stimulant to mucous membranes, chiefly used for urethral diseases, and occasionally for chronic bronchitis. May produce a red rash. Given emulsified with mucilage or saponified. *See* Liquor Copaibæ. Should be distinguished from

Oleum Copaibæ (*Off.*) U.S.

Dose.—5 to 20 minims (0·3 to 1·2 Cc.) which is distilled from it, and constitutes at least 40% of the oleo-resin. The oil is soluble about 1 in 20 Alcohol 90%.

Recent data from Schimmel indicate from Angostura oleo-resin 52% ; Bahia and Pará 62% of oil.—C.D. 1905,756.

Copaiba Resin is the residue left after distilling off the volatile oil.

To test Copaiba for Colophonium, 0·1 Gm. of Colophonium is dissolved in 0·9 of the Oleo-Resin shaken with 10 Gm. of Solution of Ammonia, and set aside ; should not gelatinise within 24 hours.—P. J. ii /05,579. We have tried the test on an adulterated sample without much success.

Mistura Olei Santali. *Dose.*—One ounce (30 Cc.).

Oil of Sandalwood 4, Tragacanth, in powder 1. Mix, and add quickly Water to 128. Shake well. Aromatic water with syrup may be used.

Emulsio Olei Santali.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

Santal Oil 1, Quillaia Tincture ½, Water to 8.—B.M.J. i./06,316, 480.

Mistura Santali Composita. *Syn.* NISBET'S SPECIFIC.

Dose.—½ to 1 drachm in water or milk thrice daily.

Santal Oil 12½ drachms, Cassia Oil 1½ drachms, Pimento Oil 40 minims, Alcohol (90%) 3½ ounces.

Capsules of Nisbet's Specific are prepared containing the Oils of ½ drachm dose of the above in 20-minim capsules.

Another formula containing in addition Morphine Hydrochloride 9 grains in 12 ounces is given.—Ph. Form.,1905,710.

Haustus Copaibæ, St. Bart.'s H. Copaiba 15 minims, Solution of Potash 5 minims, Spirit of Nitrous Ether 15 minims, Mucilage of Gum Acacia 60 minims, Camphor Water to 1 ounce.

Liquor Copaibæ, Soluble Copaiba.

Dose.—½ to 1 drachm well diluted.

Copaiba 18, Solution of Potash 40. Boil for 15 minutes, transfer to a bottle and set aside to clarify; then syphon off the clear liquor from the supernatant oily portion and the sediment,

Mistura Copaibæ, U.C.H.

Copaiba 30 grs., Solution of Potash 12 m., Cinnamon Water to 1 ounce. *Dose.*—½ to 1 ounce.

St. M.'s H. has Copaiba 15 minims, Mucilage 1 drachm, Magnesium Sulphate ½ drachm, Cinnamon Water to 1 ounce.

Liquor Copaibæ cum Buchu et Cubeba.

Dose.—1 to 2 drachms, well diluted.

Buchu in powder 5, Cubebs in powder 2, Alcohol

(60%) *q.s.* Percolate and press to obtain 14. Mix 1 part with 2 of Soluble Copaiba.

Liquor Santali cum Buchu et Cubeba.

Dose.—1 to 2 drachms.

Yellow Santal Wood in powder 4, Buchu in powder 1, Cubebs in powder 1, Alcohol (60%) *q.s.* to moisten. Macerate 2 days and percolate with more alcohol and press to obtain 20.

Liquor Santali Compositus.

Dose.—1 to 2 drachms. Mix 2 volumes of Soluble Copaiba with 1 of the last preparation.

Liquor Santal cum Kava. *Syn.* GONOSAN.

Dose.—1 to 2 drachms (3·5 to 7·0 Cc.).

Yellow Santal Wood in powder 4, Alcohol 60% *q.s.* to 15, Liquid Extract of Kava-kava 5 (*v.p.*740). Is used in gonorrhœa, and is said to suppress the ardor urinæ and tendency to chordee, to increase the output of urine and to reduce pus.

Gelatin Capsules are prepared. *Dose.*—2 capsules 3 or 4 times a day.

Blenosan Capsules contain Santal and Kava-kava Resins.

OPIUM (*Off.*). U.S.

Dose.—½ to 2 grains (0·032 to 0·13 Gm.).

The inspissated juice obtained by incision of the capsules of *Papaver somniferum* (*Papaveraceæ*) (from any geographical source). The Turkey product is best suited for pharmacy. Persian and Indian contain a large proportion of narcotine.

For galenical preparations generally, it must contain, when dried and powdered, between 9·5% and 10·5% of anhydrous morphine (U.S. 12% to 12·5% crystallised morphine); for the Tincture and Extract not less than 7·5%, these being standardised when prepared.

The B. P. method of estimating modified.—The difficulty of obtaining the 104 Cc. of filtrate is obviated. The Ether is not removed before collecting the precipitate on the filter, but after. Back-titration is conducted with $\frac{N}{10}$ Soda, after dissolving the Morphine in $\frac{N}{10}$ Acid, and this without drying. In estimating the tincture an error is pointed out—after treating 10 Cc. with lime, &c., it should be made up to 81·9 and not to 85 Cc. A table is given showing the equivalents of Morphine to $\frac{1}{5}$ Sulphuric Acid.—Dowzard's Process, P.J. ii./03,909. Dott's criticism of this method.—P. J. i./04,7.

Dowzard's further investigations showed it necessary to take 50·9 Cc. of the filtrate to equal 4 Gm. when working with 8 Gm. of *Opium* and 3 Gm. of slaked lime and 100 Cc. of water.

When working with 100 Cc. *Tincture* and 3 Gm. slaked lime, the final volume must be made up to 102 Cc., 50 Cc. of filtrate will then equal 50 Cc. of the original Tincture. The increase in volume due to the extractives is found by Dowzard to be lower than that given in the B.P.—P. J. i./04, 397.

Dowzard's method advocated.—P. J. ii./05, 125.

Ash should not exceed 4% to 8%, moisture about 12%.

Opium should be 64% water-soluble.—Ph.

C.U.D. recommended morphine 10% in dry opium as low in P. Belg.

Opium production in Minnesota—cheap labour essential.—B. & C.D. ii./05, 241.

Opium, U.S. In its normal moist condition to yield not less than 9% crystallised morphine (as in 1890).

Average Dose.—1½ grains (0·1 Gm.).

Assay method (*U.S.*).—Shake Opium 10 Gm. in small pieces if fresh, or if dry in very fine powder, with water 100 Cc. during three hours. Filter, wash the marc, and repeat the process with a further quantity of water until 150 Cc. of filtrate are obtained, and again collect 150 Cc., and finally a further 20 Cc. of filtrate. Evaporate the filtrates to 14 Gm., dilute with water to 20 Gm., add Alcohol 10 Gm., shake and add Ether 25 Cc. and Ammonia Solution 3½ Cc., shake and allow to stand six hours. Decant the Ether through a double filter paper, then add Ether 20 Cc. in two portions and wash out flask with water 15 Cc. (not more), collect the crystals, wash with water until free from mother liquor, then with a little morphinated Alcohol and dry at not exceeding 60° C., and weigh. Then wash the crystals with lime water until the washings cease to precipitate with Mercuric Potassium Iodide Solution, after acidifying. Dry, weigh, and deduct the weight of the insoluble residue from the weight of impure morphine first found; this gives the content of pure morphine.

Incompatible with Vegetable Astringents, Alkaline Carbonates, Salts of Mercury, Iron, Lead and Zinc.

Estimation of Narcotine and Codeine in Opium.—Y.B.P. 1903, 122.

Uses.—The oldest and most certain remedy for pain, also tends to check inflammation and relieve nervous diseases; lessens cough, arrests diarrhœa and dysentery. Externally the liniment is used for rheumatism, neuralgia and sciatica, and is added to fomentations, and the ointment is applied to piles and fissures of the anus. Has some power in controlling the amount of sugar in diabetes. Children are very susceptible to its action.

Opium Deodoratum, U.S. Standard as Opii Pulvis, U.S. Now deodorised by petroleum benzine (was by ether in 1890).

Average dose.—1 grain (0·065 Gm.).

Opium Granulatum, U.S. Standard same as Opii Pulvis. Prepared by drying at not exceeding 85° C. and reducing to No. 20 powder.

Average dose.—1 grain (0·065 Gm.).

Antidotes.—*See* Morphine, *p.*478. Strychnine is a valuable remedy for opium poisoning.—B.M.J.i./99,1534.

Acetum Opii, U.S.

Average dose.—8 minims (0·5 Cc.).

Opium Powder 10, Nutmeg 3, Sugar 20, Diluted Acetic Acid (6%) to 100. By maceration.

Confectio Opii, B.P. 1885.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Compound Powder of Opium 1, Syrup, by weight, 3. Contains Opium 1 in 40.

Emplastrum Opii (*Off.*). 1 in 10 of Resin Plaster.

U.S. has Extract of Opium 6 in adhesive Plaster *q.s.*, to 100.

Extractum Opii (*Off.*). **U.S., P.Austr., Ph. Ned., P. Belg.** *Dose.*—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.).

An aqueous extract standardised to contain 20% of morphine (C.U.D. coincides).

Extractum Opii Liquidum (*Off.*).

Dose.—5 to 30 minims (0·3 to 1·8 Cc.).

Extract of Opium 0·75, Distilled Water 16, Alcohol (90%) 4. Is of same strength as Tincture of Opium, containing 0·75% of morphine. Resembles Battley's *Liquor Opii Sedativus.*

Papine. A proprietary article.

Dose.—1 drachm (=$\frac{1}{8}$ grain Morphine). Children under one year 2 to 10 drops.

Said to contain the anodyne principles of opium without the narcotic and convulsive properties.

Linctus Opiatus, St. Th. H.

Dose.—Tincture of Opium 2 minims, Linctus St.Th.H. below) to 1 drachm.

Linctus, St. Th. H.

Oxymel Scillæ 15, Mucilage Tragacanth 15, Glycerin 5, Emulsion of Chloroform 3, Syrup to 60.

Linctus Scillæ, St. M.'s H.

Oxymel of Squills $\frac{1}{2}$ drachm, Compound Tincture of Camphor 15 minims, Honey to 1 drachm.

Linctus Scillæ Opiatus.—*Syn.* Linctus Camphoræ Compositus. St. Bart's. H. Gee's Cough Linctus, N.H.W. *Dose.*—1 drachm (3·5 Cc.).

Compound Tincture of Camphor, Oxymel of Squill, and Syrup of Tolu, equal parts.

Brompton H. uses Syrup of Squill *vice* Oxymel in this formula for **Linctus Tolu cum Opio.**

Linimentum Opii (*Off.*).

Tincture of Opium 1, Liniment of Soap 1; filter after a few days.

Linimentum Opii Ammoniatum, B.P.C.

Soap Liniment, Compound Camphor Liniment, Tincture of Opium, of each 6; Belladonna Liniment, Strong Solution of Ammonia, of each 1. Mix and filter. (Better to stand a week before filtering.) Is said to resemble Bow's Liniment.

Mistura Acidi Sulphurici cum Opio, St. M.'s H.

Dilute Sulphuric Acid 10 minims, Opium Tincture 10 minims, Spirit of Chloroform 10 minims, Camphor Water to 1 ounce.

Mistura Sodæ cum Opio, St. M.'s H.

Liquid Extract of Opium 3 minims, dilute Hydrocyanic Acid 2 minims, Sodium Bicarbonate 6 grains, Water to 2 drachms.

Pilula Plumbi cum Opio (*Off.*).

Dose.—2 to 4 grains (0·13 to 0·26 Gm.).

Lead Acetate 6, Opium 1, Syrup of Glucose $\frac{2}{3}$ or *q.s.*

Pilula Saponis Composita (*Off.*).

Dose.—2 to 4 grains (0·13 to 0·26 Gm.)

Opium 1, Hard Soap 3, Syrup of Glucose 1.

Pulvis Cretæ Aromaticus cum Opio (*Off.*).

Dose.—10 to 40 grains (0·65 to 2·6 Gm.).

Contains Opium 1 with 39 of Pulvis Cretæ Aromaticus. [*Dose.*—10 to 60 grains (0.65 to 4·0 Gm.) is the old "Aromatic Confection."]

Tablets each 5 grains (0·32 Gm.).

Sys Specific. An Indian cure for sprue, dysentery, and diarrhœa. It consists of 'powders'—one to be mixed with 12 ounces of water and laudanum to be added.

Pulvis Kino Compositus (*Off.*). Opium 1 in 20.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

Pulvis Opii Compositus, B.P. 1885.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.).

Opium 3, Black Pepper 4, Ginger 10, Caraway Fruit 12, Tragacanth 1. Contains 1 of Opium in 10.

Solubes Plumbi et Opii represent:—
Lead Acetate 2 grains, Opium Tincture 20 minims. For dilution with warm water 5 ounces, more or less according to the purpose required.

Suppositorium Plumbi cum Opio (*Off.*).
Lead Acetate 3, Opium 1, Oil of Theobroma *q.s.* In grains for one suppository, in grammes for fifteen.

Tablets of Opium ½ and 1 grain.

Syrupus Opii, P. Austr. Opium Extract 1, Simple Syrup 999.

Tinctura Camphoræ Composita.—*Syn.* PAREGORIC. (*Off.*). Is known on the Continent as Tinctura Opii Benzoica. *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.).
Tincture of Opium 585 minims, Benzoic Acid 40 grains, Camphor 30 grains, Oil of Anise 30 minims, Alcohol (60%) *q.s.* to 1 pint. One drachm = about ¼ grain opium. C.U.D. recommended 0·05% Morphine (*Off.*). **Ph. Ned.** has 0·05% Morphine, but amounts of other ingredients varied.

Tinctura Opii Camphorata, U.S.
Average dose.—2 drachms.
Similar in composition, 1 of opium in 250.
The presence or otherwise of Morphine may be detected and indeed compared with a Standard Paregoric by working on as small an amount as 2·5 Cc. of a specimen. The details of the method must be carefully adhered to.—Bird, P.J. ii./05,155.

Tinctura Opii.—*Syn.* LAUDANUM (*Off.*).
Dose.—20 to 30 minims (1·2 to 1·8 Cc.), or 5 to 15 minims (0·3 to 0·9 Cc.), repeated.
Standardised to contain 0·75% of anhydrous morphine. It is thus equal in strength of morphine to **Liquor Morphinæ Hydrochloridi** (3 of alkaloid = 4 of salt), but containing, in addition, the other alkaloids is more soporific. Alcohol strength 45% approx. **U.S.** has 1 of Granulated Opium (12 to 12·5% Morphine) in 10 of Alcohol (approximately 48% by vol.). **Ph. Ned.** and **P. Belg.** contain 1% Morphine, made with 70% Alcohol. C.U.D. recommended 10% strength by percolation with Alcohol 70% and to contain 1% Morphine.
Method suggested for uniform result. Mix Opium 10 in fine powder with Calcium Phosphate 5, Alcohol 70%, 75 parts. Macerate. Percolate to 100 parts. Maceration alone, however, gives equally good result.—P.J. ii./05,553.
For estimation, see note under Opium, *p.* 521.

Typhoid (the insomnia of), treated by 15 to 20 minim doses.—B.M.J. ii./04,1452.

Diphtheria, laryngeal stenosis of, treated by small doses every four hours (with Antitoxin). — B.M.J.E. i./06,63.

Tablets representing Tincture of Opium 5 and 10 minims are prepared.

Nepenthe (or ANODYNE TINCTURE) is similar and is given in dose as Tinctura Opii (*Off.*). Incompatible with alkalis.

Tinctura Opii Crocata. SYDENHAM'S LAUDANUM. *Dose.*—5 to 20 minims (0·3 to 1·2 Cc.).

P. Austr.—Opium 10, Saffron 2, Spiritus Vini Diluti 40, Cinnamon Water 60.

P.G. iv.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Alcohol 68% 70, Water 70.

Ph. Ned.—Opium Powder 60, Saffron 20, Cinnamon 5, Cloves 5, Alcohol 90%, and Water of each 250. Contains 1% Morphine. That of **P. Belg.** is similar.

Codex.—Opium 40, Saffron 20, Cinnamon 3, Cloves 3, Grenache Wine 320.

Tinctura Opii Deodorata, U.S.

Average dose.—8 minims (0·5 Cc.).

Granuated Opium 100 (purified by Petroleum Benzin 75), in Alcohol 200, Water to 1,000.

A modified method of deodorising (Gordon's) is mentioned by Caspari. Macerate Opium 100 Gm. in water *q.s.*, and concentrate infusion to 500 Cc. Heat to 82° C, add Paraffin, melting at about 50°C, 150 Gm. in small pieces, and when liquefied shake thoroughly 10 minutes. Allow to cool, remove paraffin cake, and make up filtered liquid to 800 Cc. with Water and Alcohol 200 Cc., finally with Water to 1,000 Cc.

Tinctura Opii Ammoniata (*Off.*).—*Syn.* SCOTCH PAREGORIC. *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.).

Tincture of Opium 3 ounces, Benzoic Acid 180 grains, Oil of Anise 1 drachm, Solution of Ammonia 4 ounces; Alcohol (90 %) *q.s.* to 1 pint when filtered. One ounce contains ½ grain anhydrous morphine.

Trochisci Opii, B.P. 1885.

Contained $\frac{1}{10}$ grain Extract of Opium in each, with liquorice. **Trochisci Sedativi, T.H.**, contain the same quantity with fruit basis, and are marked 'S.'

Unguentum Opii.

1 of extract in 10 of Unguentum Cetacei.

Unguentum Gallæ cum Opio. (*Off.*)

Contains 7·5% of Opium with Gall Ointment (Galls 1, Benzoated Lard 4).

'**Collapsubes**' with rectal tube are prepared for use in hæmorrhoids.

Vinum Opii, B.P. 1885.

Dose.—10 to 30 minims (**0·65 to 1·8 Cc.**)

Contained 1 of Extract in Sherry 20, with Aromatics.

U.S.—Granulated Opium 10, Saigon Cinnamon 1, Cloves 1, Alcohol 15, White Wine 85.

Wool, Opium, T.H., 1881, 1 lb. rolls.

OVULES.

Ovules are oviform vaginal pessaries for gynecological use. They may be prepared with Glycerin Suppository mass (*Off.*), but if this be found too hard the following is softer:—

Ovule Mass containing Gelatin 8, Glycerin 60, Distilled Water 30.—P.J. ii./04,633 gives Gelatin 1, Water 2, Glycerin 6. This softer form may, however, not be suitable to export to hot climates.

Ovules dissolve slowly and hence produce a continued action of the medicament on the parts in cases of leucorrhœa, also for ulceration and inflammation of the cervix uteri.

Each Ovule weighs approximately 4 drachms. The following are prepared:—

Adreucaine (anodyne and astringent).

Alum, 10 grains (astringent).

Apiol, 5 minims (to relieve amenorrhœa).

Aristol, 2 grains (antiseptic).

Belladonna Extract, 1 grain (sedative).

Boric Acid, 15 grains (soothing).

Carbolic Acid, $\frac{1}{2}$ grain (antiseptic).

Cocaine, $\frac{1}{4}$, $\frac{1}{2}$ and 1 grain (local anæsthetic).

Cocaine, 1 grain with Adrenalin $\frac{1}{500}$ grain (anæsthetic and astringent).

Ergot Extract, 2 grains (astringent?)

Hamamelis, 10 minims of Liquid Extract (anti-hæmorrhagic).

Hyoscyamus, 5 grains of extract (sedative).

Ichthyol, 5 and 10% (in ulceration, antiseptic and stimulant). Preferably made with Theobroma basis.

Iodine, 1 grain (astrigent and antiseptic).

Ovule Preparations—*continued.*

Iodoform, 5, 10 or 15 grains (antiseptic).
Iodol, 2 grains (antiseptic).
Mercuric Chloride (strength to order, antiseptic).
Morphine Hydrochloride, $\frac{1}{4}$ and $\frac{1}{2}$ grain (anodyne).
Naphthol, 1 grain (antiseptic).
Opium, 1, 2 grains (sedative).
Potassium Bromide, $7\frac{1}{2}$ grains (sedative).
Potassium Iodide, 5 grains (anti-syphilitic).
Quinine Hydrochloride, 3 grains (in leucorrhœa and to check conception).
Resorcin, 3 grains (antiseptic).
Suprarenal Extract, 5 minims (hæmostatic).
Tannic Acid, 8 grains (astringent).
Trypsin, 5 grains or as ordered.

In preparing the tannin ovules it is important to use only the slightest amount of heat. Dissolve the tannin in the cold water of the mass. Add the gelatin and allow to soak up completely, then mix in the glycerin slightly warmed and proceed in the usual way. They may, if preferred, be made with the Theobroma Oil basis.

In order to be efficient these ovules must be inserted as far as possible whilst the patient is in the supine position with the hips raised. A sanitary towel may be worn at the same time. Most effectual at bedtime.

Ovules in F.E.—Ovules de Glycerin. Gelatin 12, Water 25, Glycerin 88, evaporated to 100.
Acid Tannic, $7\frac{1}{2}$ grains ($\frac{1}{2}$ Gm.).
Belladonna Extract, $\frac{3}{4}$ grain (0·05 Gm.).
Cocaine Hydrochloride, $\frac{3}{4}$ grain (0·05 Gm.).
Ergotin, $7\frac{1}{2}$ grains (0·5 Gm.).
Ichthyol, $7\frac{1}{2}$ grains (0·5 Gm.).
Iodoform, $7\frac{1}{2}$ grains (0·5 Gm.).
Opium Extract, $\frac{3}{4}$ grain (0·05 Gm.).

PANCREAS.

In the pancreatic juice of man four distinct digestive ferments are believed to be contained, viz. :—

1. **Trypsin.**—A proteolytic ferment acting in an alkaline medium. *See p.* 532 *et seq.*
2. **Amylopsin or Pancreatic Diastase.**—Converts starch into maltose.
3. **Steapsin.**—A lipolytic ferment.
4. **A Milk-curdling Ferment.**

The first only of these, in any degree of purity, is commercially supplied, but the following preparations are assumed to contain all four ferments.

For invalids, aged persons, and those suffering from weak digestion, or those prostrated by fever or exhaustion, preparations of the pancreas of the pig (an omnivorous animal) may be employed, by means of which food may be partially or wholly digested previous to administration; their nutrition is thus maintained, and the stomach has time to regain its wonted powers of digestion.

These preparations may also be given internally in cases of dyspepsia and defective nutrition.

Pancreatinum, Pancreatin, U.S.

Dose.—2 to 4 grains (0·13 to 0·26 Gm.).

A cream-coloured amorphous powder, slowly soluble in water, and containing not more than 10% insoluble; insoluble in alcohol; consisting principally of trypsin, amylopsin, steapsin and myopsin, obtained usually from the hog. It digests albuminoids and converts, if of U.S. standard, not less than 25 times its weight of starch into sugar in an alkaline medium. Assay process is provided.

Pancreatin Tablets, $2\frac{1}{2}$ grains, with Sodium Bicarbonate, are prepared. One is sufficient to peptonise half a pint of milk.

Liquor Pancreatis, Pancreatic Solution (*Off.*).

Dose.—1 to 2 drachms (3·5 to 7 Cc.).

Fresh pancreas of the pig, freed from fat and external membrane, and divided by trituration with washed sand or pumice-stone, 1, Alcohol (20%) , Macerate for seven days and filter.

This solution possesses the amylolytic or diastasic properties of converting starch into dextrin and sugar (maltose and dextrose), and the proteolytic or tryptic action of converting albumen and fibrin into peptones, and of first curdling and then peptonising milk.

The pancreas is sometimes called the 'sweetbread,' but the sweetbread known to cookery is the thymus gland of the sheep, and *not* the pancreas, which, being tough and stringy, is inferior in value to the sweetbread of the throat.—Ph.

2 Cc. together with 0·2 Gm. of Sodium Bicarbonate and 20 Cc. of water added to 80 Cc. of milk, and the

mixture kept at 113°F. for one hour; coagulation should no longer occur on adding Nitric Acid. (*Off.*).

Pancreatic infiltration cured by Pancreatic Extract.—L. ii./04,1694.

In certain forms of severe glycosuria depending on excessive activity of the liver.—Batty Shaw, 187.

Glycerinum Pancreatis, *Martindale*, a digestive preparation made from the fresh pig's pancreas.

Dose.—1 to 2 drachms (3·5 to 7 Cc.), representing ¼ to ½ drachm of the fresh substance.

Liquor Pancreaticus (Benger's).

Dose.—1 to 2 drachms (3·5 to 7 Cc.) in water with meals; or mixed with food, such as farinaceous gruels, bread-and-milk, or arrowroot, when cool enough to sip, or, when given to aid intestinal digestion, 1 or 2 drachms in water with a pinch of sodium bicarbonate 2 or 3 hours after a meal. As an addition to nutritive enemata, a dessertspoonful should be added to beef tea or milk gruel just before its administration. Liquor Pancreatis will not keep diluted, and a temperature much over 140° F. destroys the ferment, which does not act in an acid medium.—Proc. Roy. Soc. xxxii.145.

Peptonised Milk (*v. also* Peptonising Powders, *p.*531)

Mix two-thirds of a pint of fresh milk with one-third of a pint of water, and warm in a saucepan to a temperature of about 140° F. (or the diluted milk may be divided into two equal portions, one of which may be heated to the boiling point and then added to the cold portion, the mixture will then be of the required temperature). Add two teaspoonfuls of Liquor Pancreatis, and half a level teaspoonful of sodium bicarbonate. Pour the mixture into a covered jug and place in a warm situation for ten to twenty minutes, then boil the product. It can then be used like ordinary milk. Gruel can be similarly treated. *See also* Peptonoids of Beef for Enema, *p.* 546.

In the place of the water half a pint of lime water may be used to the pint of milk. The preparation if desired for early use may be kept at 15° C. for three or four hours; need not necessarily be boiled.

For infant feeding, Fresh Cow's Milk ½ pint, Malt Extract 1 teaspoonful. Pasteurise the milk in a bottle, and after cooling 10 minutes add the Malt Extract; boiled water or lime water may be used in customary manner as diluent. The casein is

prevented from curdling and the caseinogen modified. Fine flocculi are produced in the stomach, easily acted on.—L. i./06,1013. Perhaps a little more malt would be better. —W.H.M.

Pilula Pancreatica, Keratin-coated (Benger).

Dose.—One after meals in diabetes.

Peptonised Beef Jelly (Benger).

An extract of beef containing much of the fibrin converted into peptone or partially digested by pancreatic trypsin. May be taken by teaspoonfuls as a restorative for invalids and the aged. Is supplied in glass jars.

Peptonised Chicken Jelly (Benger) is also manufactured similarly, and supplied in glass jars.

Pancreatic Emulsion of Fat.

Prepared by mixing and pounding the pancreas of the pig with lard and water, straining, and exhausting the strained substance with ether. The ether forms a solution of pancreatised fat. From this the ether is distilled, and the fat mixed with a mixture of rectified spirit and water (1 to 3) and emulsified by agitation. Oil of cloves is added to flavour and preserve it.

Dose.—1 to 3 drachms, in a little milk or water, with a little spirit added, if liked, once or twice a day 1 or 2 hours after a meal. Given in consumption and other wasting diseases attended with loss of power to digest and assimilate food, especially where fats and cod-liver oil do not agree with the stomach.

Pancreatised Farinaceous Food (Benger's).—Wheat flour, partially dextrinised by dry cooking, is impregnated with an extract of pancreas; is suitable for infants and invalids; when mixed with milk or milk and water, artificial digestion of the food and milk takes place, which can be checked at any point by boiling.

Peptonising Powders.

Pancreatic enzymes mixed with sodium bicarbonate, in glass tubes. Place the powder into a clean quart bottle with $\frac{1}{4}$-pint of cool water, add a pint of fresh milk, and shake. Place the bottle in warm water for ten minutes, then pour the milk into a saucepan and heat quickly to boiling and allow to cool sufficiently for use. If desired, smaller proportional quantities may be utilised.

Pulvis Pancreaticus Alkalinus (Benger) is similar.

Pankreon.—A proprietary preparation. Tablets ¼ grain each to be taken with meals. In marasmus with fatty diarrhœa. Fortschritte der Med., July 20,05.

Trypsin. *Dose.*—8 to 20 grains (0·5 to 1·3 Gm.).

This ferment exists in the form of whitish powder, possessing an odour like pepsin. It changes proteids into peptones in alkaline media. One part should peptonise in 1½ hours about 100 parts of coagulated egg albumin. It is employed for peptonising milk, and to assist digestion in diabetes. May be given in keratin-coated pills.

Action of Trypsin on the phosphorus of caseinogen—renders it all soluble in 24 hours.—J.C.S.A., April 1906, *p.* 323; L.i./06,1049.

Its failure in some cases of diabetes may be due to the fact that all cases of diabetes are not due to pancreatic disease.—Batty Shaw, 182.

Batty Shaw on Auto-intoxication.—L. i./06,1295, 1375,1455.

Soluble slightly in water, more so in glycerin.

Trypsin treatment of Cancer, Sarcoma, and malignant growths. A recent rational treatment consists of the use of Trypsin and other pancreatic ferments, which research has shown may in a short time cause the complete degeneration of cancerous growths. The process presumes that the growth of the cancer cell depends on the presence of an enzyme working in an acid medium, and it was therefore deemed expedient to administer a stronger enzyme in an alkaline medium to stop the elaboration of the new cell-tissue in question. The ferment chosen was the pancreatic enzyme Trypsin, which has been found to be most active. It was noted early that apparently some connection existed between diabetes and cancer. The inference was that as in diabetes, so also in cell-proliferation in cancer, the pancreas is probably at fault. Experiments proved that Trypsin of the pancreas broke up glycogen as well as glucose.—C.D. i./06,214,273. There is an excess of glycogen in fœtal tissues and in cancerous growths, indeed wherever cell growth is active. (This glycogen theory is however, not held by all.)

The treatment may be outlined as follows: —

(1) Give sugar in excess.

(2) Injections of 15 minims of 2% Trypsin Solution with a little Eucaine Solution beforehand.

(3) Give concurrently Pancreatin or Trypsin in increasing doses by the mouth, — **Liquor Trypsin** in 1 to 2 drachm doses three times a day before meals, or give **Glycerinum Pancreatis.** Cachets or Capsules of Trypsin 5 grains each, and with Ox Gall 2 grains are also prepared.

(4) Trypsin preparations used locally according to the situation of new growth. (*a*) **Pigmentum Trypsin.** Suitable for painting on ulcerated surfaces or used in poultices. (*b*) **Suppositorium Trypsin** for use in carcinoma of the rectum. (*c*) **Trypsin Ovules** with gelatin basis for carcinoma uteri.

General improvement under Trypsin treatment was noticeable.—B.M.J. i/06,240.

The hypodermic injection is made in sound tissue near the growth if possible, otherwise in flank or buttock. Begin with 15 minims, then give 20 and 30 minims.

Hypodermic Sterules containing 30 minims of the Trypsin Solution are prepared.

Experiments on mice with adeno-carcinoma. The action of the trypsin is to pull down the cancer albumin, a living substance, and the cancer ferment, malignin, produced by this. Present theories of cancer may be classed (*a*) as germinal or gametoid; (*b*) embryonic or somatic; (*c*) trophoblastic or asexual generation. As Trypsin (the 'architect' of soma) is completely destructive to the trophoblast generation this goes far to prove that in its nature cancer is neither germinal nor somatic.—B.M.J. i./06,140,318.

The natural and comparative immunity of the duodenum and small intestine, together with the slower rate of growth in cancer of the large intestine, would appear in favour of treatment of inoperable cancer by preparations of the pancreas, bile salts, and intestinal gland extracts and ferments, alone or combined.—B.M.J.i /06,716.

Malignant growths, associated with excess of lipase ferments, and loss of glycolytic ferment. Action of glycolytic ferments.—B.M.J. i./06,1245.

PAPAIN.

Syn. PAPAYOTIN. (But this term is sometimes applied to the crude powder produced by drying the

juice, otherwise known in commerce as dried Papaw Milk. Dose of this, 3 to 10 grains (0·2 to 0·65 Gm.).

Dose of Papain.—1 to 8 grains (0·065 to 0·52 Gm.).

A white or whitish, amorphous, slightly granular powder, prepared from the juice of the Papaw, *Carica Papaya*. 75% should be dissolved by absolute alcohol.

Uses.—Is given as a digestive in chronic cases of indigestion and dyspepsia, with acid eructations and painful gastric fermentation, and should peptonise milk as quickly as pancreatin. It acts in acid, alkaline, or neutral media, has the property of digesting fibrin like pepsin (as much as 200 times its weight in some cases), and its action is not checked by carbolic acid. —B.M.J. ii./91,1318; L. ii./00,327. Acts best in a slightly acid medium.—J.C.S.A. Apl.1906,328; L. i./06, 1049.

Ulcers and fissures of the tongue painted with a solution of Papain 1 to 2 in 10 each of glycerin and water recommended.—L. ii./93,26.

Is a vermifuge destructive to ascarides and tænia.

Three commercial forms of Papain examined. Vines states papain contains a fibrin-digesting but not peptolytic protease of the nature of pepsin as well as a peptolytic, but not fibrin-digesting protease of the nature of an erepsin.—L. i./05,589.

Elixir Papain.

Dose.—1 drachm (3·5 Cc.) with meals.

Glycerinum Papain.

Dose.—1 drachm (3·5 Cc.) with meals.

Glycerin slightly acidulated with hydrochloric acid, is a solvent for papain, and forms a useful mode of administration. — C.D. ii./00,170. It may be used as a pigment for chronic eczema, warts and indurated skin, and has been applied to diphtheritic exudation. A strong solution will remove some tattoo marks.

Tablets, 2 grains (0·13 Gm.). *Dose.*—1 or more.

Trochisci Papain ($\frac{1}{2}$ gr.)—With meals for dyspepsia.

Trochisci Papain ($\frac{1}{5}$ gr.) **et Cocainæ** ($\frac{1}{10}$ gr.)

These, if slowly sucked, are useful for ulcers, warts or sores on tongue, &c.

Carpaine. $C_{14}H_{25}NO_2 = 237·44$ (239·24 I. Wts.).

Dose.—$\frac{1}{30}$ to $\frac{1}{6}$ grain (0·002 to 0·01 Gm.).

An alkaloid contained in the leaves of *Carica Papaya*; is a heart poison, and as a tonic may replace digitalis.

Its **Hydrochloride** $C_{14}H_{25}NO_2HCl = 273{\cdot}63$ (275·698 I. Wts.) is freely soluble in water, dose by injection, $\frac{1}{30}$ to $\frac{1}{15}$ grain (0·002 to 0·004 Gm.).

PARAFFINA.

The Paraffins used in pharmacy are arranged in order of consistency, commencing with the Hard (*Off.*), then follow the Soft (*Off.*)—vaseline and similar bodies and unctuous compounds, then the vaseline oils (thick fluids), then the official Liquid Paraffin, and finally the light fractions known as Amyl Hydride, Petroleum Spirit, &c.

Paraffinum Durum, Hard Paraffin (*Off.*).—*Syn* Paraffin Wax.

A mixture of several of the harder members of the paraffin series of hydrocarbons $C_{20}H_{42}=280{\cdot}2$ (282·336 I Wts.) to $C_{27}H_{56}=377{\cdot}57$ (380·448 I.Wts.); obtained by distilling shale, separation of the liquid oils by refrigeration, and purification of the solid product. Is colourless, semi-transparent, crystalline, inodorous, and tasteless, slightly greasy to the touch. Sp. Gr. 0·82 to 0·94. Insoluble in water, slightly soluble in absolute alcohol, soluble about 1 in 80 in ether. It melts at 130° to 135° F., and burns, but not without a wick, with a bright flame, leaving no residue. Hard paraffins are supplied with the following melting points:—100°, 104°, 110°, 115°, 120°, 125°, 127°, 130°, 135° F.

U.S. requires paraffin melting at 51·6 to 57·20 C. (124·88—134·96 F.). Is tested for stearic acid with fuchsin.

Ceresin. A hard white paraffin prepared from ozokerite, or earth wax; has melting-point about 130° F. When artificially coloured to resemble yellow wax it is sold as **Yellow Ceresin.** Ozokerite is a hard paraffin obtained from Galician deposits.

Paraffin Solid, Sterilised.

For subcutaneous injection in plastic operations. This is used to improve the size and shape of the nose, ear, &c., where abnormal from birth, injury or from disease such as syphilis or lupus. It has been tried also as a means of checking prolapsus ani and prolapsus uteri, and in ophthalmic surgery. A certain consistence and melting point are important. Stephen Paget

advises a compound melting between 110° and 115° F. Solid paraffin of any desired melting-point (some authorities on the other hand advise 105° F. and the injection to be made at 120° F.) can be obtained in sterile bottles covered with a 1 in 2,000 solution of Mercuric Chloride. A special rubber-covered syringe is used to prevent cooling during injection, which is made at the rate of 1 Cc. every 10 seconds. The paraffin shrinks a little under the skin as it cools.—Pr. lxx,195.

The bottle is placed in hot water to melt the contents, then it and the syringe are placed in water about 5° warmer than the M. Pt. of the paraffin. The syringe is filled and the needle warmed in very hot water to obviate the paraffin solidifying; the injection should be deep and carried out quickly.—B.M.J, ii./04,1154.

For hernia.—L. ii./03,188. For use as a stump on which to fit an artificial eye.—L. i./03,299. For a badly sunken nose 7 to 8 Cc. are sufficient.—B.M.J. i./03,11. Prolapse of bowel treated with good results.—B.M.J. i./03,366. In atrophic rhinitis.—L. i./03,168; in prolapse of the rectum and uterus.—L. i./03,799. Submucous peri-rectal injection curative of incontinence of fæces.—L.i./04,716. Nasal deformities treated; lengthy experience (100 cases). The procedure is void of danger.—B.M.J. ii./04,1237. Two unsatisfactory injections.—L. i./05,221. A paraffin testicle made with satisfactory result.—B.M.J. ii./05,441. Used for nasal deformities.—Jl. Laryng. Soc., Feb. 1906, 89.

Emulsio Paraffini. *Syn.* ASEPTIC SHAVING CREAM. St. Th. H.

Hard paraffin (melting at 55° C.) 22, Prepared Suet 3, Soft Soap 2, Tragacanth Powder 2, Glycerin 2, Oil of Lavender 1, Boiling Water 68, all by weight. The soap and boiling water are thoroughly emulsified with the paraffin and suet in a pan surrounded by hot water, allowed to cool adding the tragacanth gradually, and when nearly cold the other ingredients. Is employed in surgery for shaving the part prior to operation.

Paraffinum Molle, Soft Paraffin (*Off.*).—*Syn.* PETROLATUM, U.S. and PETROLATUM ALBUM, U.S.

A white or yellow semi-solid mixture containing some of the softer or more fluid members of the paraffin series of hydrocarbons $C_{15}H_{32}=210{\cdot}65$ (212·256 I. Wts.) to

$C_{20}H_{42}$=280·2 (282·336 I. Wts.). Melts at 96° to 102° F., 35·5° to 38·9° C., or even somewhat higher (U.S. require 45° to 48° C.); is usually obtained by purifying the less volatile portions of petroleum. It is known in commerce by various fanciful names, *e.g.* **Vaseline, Vaselinum.** This, if filtered through animal charcoal, becomes **Vaselinum Album.**

There are several similar compounds :—

Adepsine, Chrisma, Saxoline, Geoline, and **Salvo Petrolia** (white and yellow).

Soft paraffin is bland, inodorous, and tasteless, It is unchangeable—cannot oxidise or become rancid, and thus set up irritation. It is not affected by mineral acids or caustic alkali.

Soluble in alcohol slightly, freely in ether and chloroform, insoluble in water. When melted, it combines with oils, and many waxes, oleates, and oleic acid. It readily dissolves thymol, menthol, and salicylic acid; chrysarobin and phenol about 1 in 20; the alkaloids dissolve in it in about the following proportions:—atropine, 1 in 120; cocaine, 1 in 100; morphine, 1 in 200; quinine, 1 in 80; and veratrine, 1 in 80. The oleic acid solutions of these dissolve in it in all proportions.

Soft paraffin is not readily absorbed, but protects the part to which it is applied, and hence is suitable as a vehicle for drugs intended to have a surface action; by its emollient effect it prevents the formation of hard crusts of débris. It is well adapted for preparations of lead, mercury, zinc, and sulphur iodide.

Ceratum Petrolei is a firmer basis.

Vaseline or Salvo Petrolia (preferably white) 2 parts, Hard Paraffin (135° to 140°) 1 part.

Melt and stir till cold in an evaporating dish. It protects the parts to which it is applied more effectually than simple soft paraffin. With slight modification the British Pharmacopœia adopted this basis as—

Unguentum Paraffini, (*Off.*).

Hard Paraffin 3, Soft Paraffin 7. Prepared as above. When for white ointments should be prepared with white soft paraffin; and when in coloured ones with the yellow variety. Gradually allow to cool, stirring constantly until quite cold. The proportions may be modified to meet the exigencies of climate and temperature (*Off.*).

May be set aside to crystallise (or allowed to cool on the water bath) and then rubbed down again.

A Hard Paraffin with somewhat lower melting point, *e.g.*, 115°—125°, and less prone to become crystalline, would be much better for the purpose. Another method claimed to give good results: Mix ⅔ of the Soft Paraffin at a temperature just above melting point with the Hard Paraffin, melted with ⅓ of the Soft Paraffin; allow to cool to the point when it begins to congeal; set aside without stirring, will not go lumpy.—B. & C.D. 1905. (But our experiments showed no advantage in this over melting all of both together and allowing to set, can then be rubbed smooth.) A further suggestion is to modify the formula to Hard Paraffin 2, Soft Paraffin 6, Wool Fat 2.—C.D. i./06, 259. And another, to sieve such ointments.—C.D. i./06,470.

'Collapsubes' of Vaseline and of Petroleum Cerate with catheter and rectal attachments are convenient for uterine and rectal medication. The base may be medicated with various useful antiseptic and astringent principles; for formulæ, *vide* Index.

Ceratum, U.S. White Petrolatum 20, White Wax 30, Benzoated Lard 50. Melted together and stirred until the cerate congeals. In heated seasons and warm latitudes, White Wax 5 may replace 5 of Benzoated Lard.

Dental Wax. Beeswax 6 ounces, Hard Paraffin 1 ounce; melt together, add ½ ounce Alkanet and keep warm for two hours, then strain and add Tincture of Tolu 2 drachms, Otto of Rose 5 drops. Generally supplied in sheets 6½ by 3½ inches.

Dental Use.—The sheet is warmed over the flame and moulded carefully over the model. It is used for mechanical purposes prior to vulcanisation.

Vaseline Oil.—*Syn.* LIQUID VASELINE.

Under this name a semi-liquid mixture of paraffins of low melting-point is used as a vehicle for **Hypodermic Injections.** For the suspension of insoluble mercurial salts, such as calomel, salicylate, succinimide, thymol-acetate, and yellow oxide of mercury, 1, 5 or 10% mixtures being employed.

Oleum Petrolei Flavum is a commercial article of similar consistence, but yellow in colour.

Emulsio Petrolei cum Hypophosphitibus, B.P.C. *Dose.*—1 to 4 drachms.

Liquid Paraffin 8 ounces, Gum Acacia 4 ounces, Oil of Cinnamon 24 minims, Tragacanth 120 grains. Mix and

add Water 6 ounces. Dissolve Sodium Hypophosphite and Calcium Hypophosphite of each 192 grains, in Water 4 ounces. Add to the above with constant trituration, then Water *q.s.* to 24 ounces.

Is found to be more palatable flavoured with Elixir of Saccharin 50 minims instead of half the Cinnamon Oil.

Emulsio Petrolei cum Hypophosphitibus cum Acido Cinnamico.

Is the above with $\frac{1}{6}$ grain Cinnamic Acid in each drachm. For use in phthisis.

Petrolatum, U.S.

A yellow unctuous mass (mixture of the hydrocarbons, chiefly of the methane series) having a melting point of 113° to 118·4° F. and when liquefied and brought to temperature of 60° C has Sp. Gr. 0·820 to 0·850. In addition there is Petrolatum Album U.S. which is purified.

Paraffinum Liquidum (*Off.*). — *Syn.* OLEUM PETROLEI. PETROLATUM LIQUIDUM, **U.S., P. Austr.** (Sp. Gr. 0·880.).

A clear oily liquid, without taste, colour, odour or fluorescence, obtained from petroleum after the more volatile portions have been removed by distillation. Has Sp. Gr. 0·885 to 0·890 (too high for spraying as also for 'Toilet Paraffin,' is preferred with gravity 0·865 to 0·870), boils not below 680° F. (360° C.). U.S. gives larger range of Sp. Gr.,—0·870 to 0·940° at 25° C.

In commerce, Liquid Paraffin is known under various names such as **Adepsine Oil, Chrismaline, Saxol, Oleum Deelinæ, Atoleine** and **Paroleine.**

It is used as a basis for laryngeal and nasal spray solutions or pigments, containing menthol (1 in 8 or more), cocaine (soluble only 1%) or other medicaments.

It should be particularly noted that both the alkaloidal bases and their salts are in general only very slightly soluble in any of these liquid paraffins.

The intervention of oleic acid in the case of the alkaloids assists solution.

In colitis in children paraffin internally is beneficial. —L. i./06,94.

Capsules (Gelatin) of Sterile Liquid Paraffin are made for lubricating catheters, &c.; they contain 10 minims, and are of special shape with pointed ends.

Paraffin and Agar administered in constipation—not suggested.—West Ldn. Med. Jl., Apl. 1906.

The various **Lubricating** and **Lighting Oils**, *e.g.* Kerosene-fractions between 120° and 133°C., and **Mineral Naphtha** are the next fractions, and are mentioned here to render the series more complete.

Petroleum Benzine is the fraction between 60° and 90° C. This must be carefully distinguished from Benzene, the product obtained from Coal Tar, *q.v.*

Uninflammable Benzine may be made by mixing with 40% carbon tetrachloride.

Our experiments showed that a smaller proportion of carbon tetrachloride is insufficient. If a light be applied to the 40% article it does not burn freely.

Petroleum Spirit. *Syn.* PETROLEUM ETHER (*Off.*) used for heating cauteries. Has Sp. Gr. 0·67 to 0·7, and distils over below 60°C. C_5H_{12}=71·55 (72·096 I. Wts.) principally. Further varieties are known as **Rhigolene** (boiling between 20° and 40° C.) and **Ligroin** (boiling between 80° and 120°C.).

Æther Petrolei, P. Austr. has Sp. Gr. 0·64 to 0·67; **Ph. Ned.**, 0·65 to 0·67; **Petroleinum, P. Belg.** Sp. Gr. 0·64 to 0·67. Boils at 50° to 75° C.

Amyl Hydride. *Syn.* PENTYL HYDRIDE; PENTYLENE; HYDRAMYL. Obtained by the fractional distillation of Petroleum Spirit. Sp. Gr. 0·625 to 0·649, boiling point about 86° F. (30° C.). It is very inflammable; applied locally, it is not absorbed, but rapidly freezes the part by evaporation.

Chemical examination of petroleums.—C.D. i./05,776.

Oleogen contains Oleic Acid, Yellow Petroleum Oil, with a proportion of Ammonia. A clear yellow oily preparation. Sp. Gr. 0·91. It is miscible with Chloroform in all proportions. In this preparation the mixture of Oleic Acid and Petroleum Oil is not subjected to the action of Oxygen, and so differs from the patented **Vasogen**, *v.* below.

Oleogen Camphor. 20% Rubefacient.

Oleogen Guaiacol. Contains 20%. Antituberculous

Oleogen Ichthyol. 10% Antiseptic used in skin diseases.

Oleogen Iodi. 5% and 10% Iodine. Antisyphilitic.

Oleogen Menthol. 2% Rubefacient. Antineuralgic.

Oleogen Salicylicum. 10% Antirheumatic.

These (liquid) Oleogen compounds are special preparations useful for introducing the various medicaments men-

tioned into the skin by inunction. They are rapidly absorbed.

Vasenol. An emulsion of Soft Paraffin and Spermaceti, containing Soft Paraffin 28 ounces, Cetaceum ½-ounce, Water 8 ounces. Forms a useful ointment basis.—B.M.J. ii./04,1414; L. i./05,1396.

The addition of the higher alcohols contained in the Cetaceum forms a useful method of emulsifying the paraffin; the preparation mixes with water forming a neutral emulsion. It is readily absorbed.

Vasogen and Valsol (or Valsolum).

Under these names "Oxygenated Petroleum" preparations are made, containing Creosote 20%, Guaiacol 20%, Ichthyol 10%, Iodine 6 and 10%, Iodoform 3%, Menthol 2%, Mercury 33⅓% and 50%, Sulphur 3% (Vasothion), Tar 25%, and other substances for skin medication. Dissolves iodoform and forms an injection useful for tubercular abscesses and anal fissure.—P.J. ii./96,79; L. ii./99,219.

According to a patent taken out by F. W. Klever, which expires in 1907, mineral oils are treated with oxygen under pressure, alkalis added, and when necessary Oleic acid. Mineral oils 0·9 Sp. Gr. should be used. When vaseline oils are used the products are called Vaselina Oxygenata–Vasogene. Ceresin, paraffin, fat and wax may be added.

When Vasogen is ordered the ointment base is intended. The patentee's vasogen compounds are in a fluid form, such fluidity being secured in the course of the secret process, but vasogen ointment-base can, of course, be mixed with any drug by the dispenser.

Vasoliments and linogens are fully described in P.J. ii./02, 415. The former are made with oleic acid, alcoholic ammonia and 'melted' paraffin.

The linogens are similar, containing linseed oil in place of liquid paraffin.—P.J.ii./02,415.

Parogens are similar, and are made from a basis of Liquid Paraffin 40, "Olein" (? Oleic Acid) 40, Ammoniated Alcohol (5%) 20, shaken together to make a clear liquid.—P.J.i./06,618.

Parogen Salicylicum contains 10% Salicylic Acid.—P.J.i./06,1653.

Lotio Paraffini Composita. Gt. Orm. H.

Soft Paraffin 3 ounces, Balsam of Peru 2 drachms, Mercuric Oleate 60 grains, Olive Oil 1½ ounces. To be applied with a stiff brush. For parasitic skin diseases.

PELLETIERINA.

$C_8H_{15}NO = 140{\cdot}10$ (141·16 I. Wts.).

Dose.—3 to 6 grains (0·2 to 0·4 Gm.).

An alkaloid, or mixture of alkaloids (*see* Tannate

below) obtained from pomegranate root bark, *Punica Granatum* ('Granatum' U.S.) (*Lythraceæ*), in minute shining white crystals. The alkaloids are four in number, their amount varies between 0·5 and 0·7%.

Estimation (volumetric and gravimetric) of alkaloids in.—P.J. ii./05,580,

Fluidextractum Granati, U.S.

Average dose.—30 minims (2 Cc.). 1=1. A glycero-hydro-alcoholic extractive.

Pelletierinæ Sulphas, Punicine Sulphate.

$(C_8H_{15}NO)_2H_2SO_4$ =377·54 (380·396 I. Wts.).

Dose.—5 to 8 grains (0·32 to 0·52 Gm.).

A brown viscid, syrupy liquid, freely soluble in water. It is occasionally in the form of a crystalline mass. Has been recommended subcutaneously injected for paralysis, vertigo, Menière's disease, tetanus, and hydrophobia, but mostly used as a remedy for tape-worm; 5 to 8 grains taken fasting, followed by a full dose of compound tincture of jalap; in nine cases out of ten the head is passed; for 13 years, half the above dose, and for infants one-tenth.

Pelletierinæ Hydrobromidum.

$C_8H_{15}NO,HBr$ =220·45 (222·128 I. Wts.).

Dose.—5 to 8 grains (0·32 to 0·52 Gm.).

A brownish viscid liquid. Used in case of paralysis of muscles of the eye with good results. The hydrochloride is also prepared.

Pelletierinæ Tannas, U.S.

Dose.—5 to 8 grains (0·32 to 0·52 Gm.).

A greyish powder only slightly soluble in water, but soluble about 1 in 80 of alcohol 90% In tapeworm is an efficient remedy. As a tæniafuge, 8 grains followed in 2 hours by an ounce of castor oil proved an effectual dose, causing neither colic nor headache.—L. ii.94,1273.

According to U.S. is soluble in Water 235, in 12·6 of Alcohol 90%, and in 300 of Ether at 25° C.

PEPSINUM (*Off.*) and U.S.

The gastric juice of man is believed to contain two distinct digestive ferments:—

a. Pepsin. This changes proteids (fibrin, albumen, &c.) into peptones in an acid medium, 0·2% of Hydrochloric Acid being the most advantageous. To this the medicinal pepsins owe their activity.

b. Curdling ferment, which curdles the casein of milk; this is very active in the stomach of the calf, even when dried; it is contained in the preparations of rennet preserved with salt, known as **Essence of Rennet.**

Rennet Tablets are prepared and are of considerable convenience. One will curdle a quart of milk.

Pepsin (*Off.*) is a light yellowish brown or white powder, or in translucent grains or scales, prepared by drying under 100° F. the fresh mucous lining of the stomach of the pig, sheep, or calf. It has a faint, not disagreeable, odour, is moderately soluble in water and B.P. states soluble 1 in 100 of alcohol (90%); rubbed with water, it makes a glairy mixture. That prepared from the stomach of the pig is preferred, and known as Pepsina Porci. Pepsin is supplied to dissolve 2,500, 3,000 (U.S.), and 5,000 times its weight of freshly coagulated and disintegrated white of egg.

Experiments on determining the proteolytic activity of pepsin. —C.D.i./05,741.

The official test modified in several useful points, to overcome the difficulty of weighing 0·005 Gm. of pepsin. Triturating the white of egg so as to break it up as fine as possible and shake frequently every 15 minutes.—P.J.ii./04,376.

Suggested to examine pepsine by time taken to produce a certain amount of peptone,—C.D.i./06,297; B. & C.D.i./06,159.

Casein is also employed for estimating the digestive power of pepsins.—Y.B.P. 1902,69

Incompatible with alkalis, alcohol, and all tinctures. *See also* Tocher, P.J. July, 28,06, *p*. 88.

Soluble and Insoluble Pepsins (Commercial).

Insoluble Pepsins are of two kinds, one precipitated by salt, and one made directly from the selected membranes without digestion, but purified by washing in spirit. These require the presence of a small quantity of Hydrochloric Acid to effect solution in water.

Soluble Pepsin is made by self-digestion of the membranes and subsequent dialysis of the resulting Peptone, thus leaving the peptic power in a soluble and more isolated form. It is then dried on glass plates, the product being sold in scale form or powder if preferred.

Dose.—5 to 10 grains (0·32 to 0·65 Gm.) either with or immediately before or after meals, in a pill or cachet, or sprinkled between slices of bread and butter. It is not unpalatable sprinkled on meat like pepper.

In sprue and hill diarrhœa with good results.—B.M.J. ii./05,1519.

Glycerinum Pepsini (*Off.*).

Dose.—1 to 2 drachms (3·5 to 7 Cc.) in water.

Glycerin 525, Distilled Water 260, Hydrochloric Acid 10. Mix and add Pepsin 80. After a week decant or filter, and add Distilled Water *q.s.* to 875. (=Pepsin 1 in 12); is a very active solution.

It is better to dissolve the Pepsin in the water, add the glycerin in 3 or 4 lots, and finally the acid. Amount of pepsin should be less.—P.J.i./04,84.

A good preparation may be prepared without any precipitation by using good scale pepsin. An unfiltered specimen made in 1898 is perfectly bright now, 1906.

Elixir Pepticus.

Dose.—½ ounce after each meal.

Glycerin of Pepsin 8, Dilute Hydrochloric Acid 1, Aromatic Syrup to 32.

Liquor Pepticus (Benger's).

Dose.—1 to 2 drachms (3·5 to 7 Cc.) in a wineglassful of water with meals. An active solution of the ferments in weak alcohol.

Pepsina Liquida. Fluid Pepsin. A proprietary article agreeably flavoured. 1 drachm is claimed to peptonise 1,000 grains of egg albumen.

Elixir Pepsini Bismuthi et Strychninæ.

Dose.—1 drachm (=Pepsin ½ grain, Bismuth and Sodium Tartrate 2 grains, Strychnine $\frac{1}{64}$ grain).

Dissolve Scale Pepsin 64 grains in Glycerin 1 ounce, Water 1 ounce, mixed. Dissolve separately Strychnine 2 grains in Tartaric Acid 2 grains, Water 3 ounces, and add Glycerin 1 ounce. Then mix with Glycerole of Bismuth and Sodium Tartrate 2 ounces, and add Aromatic Elixir 8 ounces, and Caramel 4 drops. Finally, pour the Pepsin Solution first prepared into the other liquid.

To prepare the **Glycerole of Bismuth and Sodium Tartrate** dissolve Bismuth Subnitrate 1142 grains in Nitric Acid 19 drachms, previously diluted with Water 10 drachms. Then add in parts, Water 16 ounces. Add Tartaric Acid 860 grains, and then gradually Sodium Bicarbonate 977 grains. Dilute the Bismuth Tartrate formed with Water 32 ounces. Allow to deposit, and wash repeatedly until free from Nitric Acid. Mix Sodium Bicarbonate 977 grains with Water 5 ounces, and add cautiously Tartaric Acid 860 grains, warming slightly to dissolve. Dissolve the Bismuth precipitate in this Solution, add Glycerin 8 ounces. Evaporate or dilute with Water if necessary to 16 ounces. Each drachm contains 16

grains of Bismuth and Sodium Tartrate with excess of Sodium Tartrate.—Caspari. Looks better coloured pink.—W.H.M.

Pepsina Amylacea, Pepsine Acide Amylacée ou Poudre Nutritive of the French.

Dose.—5 to 15 grains (0·32 to 1 Gm.). Is prepared with the addition of starch and slightly acidulated.

Pepsinum Saccharatum, U.S. (1890.)

Dose.—60 to 100 grains.

Pepsinum U.S. 1, Milk Sugar 9. Resembles Pepsinum Saccharatum, P.Jap.

Pepsin with Diastase. *Dose.*—2 drachms to ½ ounce.

Of agreeable flavour, containing both the albuminoid and starch-converting ferments.

Pegnine. A German milk sugar and rennet preparation for curdling milk, rendering same digestible.

Pepsin-Essenz (Liebreich's).

Dose.—1 to 2 drachms (3·5 to 7 Cc.) after meals.

Contains principally the curdling ferment in dilute glycerin; it is weak in proteolytic power.

Peptone.

A whitish or pale-brown powder, prepared from meat (the proteids and albuminoids), peptonised either by acidulation and heat under pressure, or by artificial digestion with pepsin or trypsin, and freed from saline matter. It is soluble in water, and is used for bacteriological culture media, and as a bile test (*v.p.*831).

Peptonised Beef.

A chocolate-coloured paste, having a bitter taste and the odour of extract of beef; prepared by artificially digesting beef by means of acidified fresh gastric juice and concentrating the solution. It is sometimes added to beef tea, but is too unpleasantly bitter to be readily taken by patients. It forms a useful nutritive enema.

Peptone F.E. is manufactured by digesting 1 kilo of beef with 10 litres of water (containing 4 Gm. of hydrochloric acid per litre) with pepsin 10 Gm. for 8 hours at 40° with frequent shaking. Termination of reaction shown by absence of precipitate with nitric acid on adding to a little of the filtered liquid. Evaporate to dryness; 1 kilo yields 250 Gm. approximately.

Peptonised Beef Suppositories.

Contain about 30 grains of the last preparation in each. As much as 2 ounces of proteids can be administered daily by this means.

Enema Nutriens.

Yolks of two eggs, Pure Dextrose 30 Gm., Sodium Chloride 0·5 Gm., Pancreatised Milk to 300 Cc. To be slowly syphoned (not syringed) into the bowel by aid of a soft rubber catheter and small funnel. Observe large proportion of carbohydrates. Albuminoid constituents only very slightly absorbed by the rectum.—B.M.J. i./06,634.

Enema Nutriens, St. M.'s H.

Pancreatic Solution 1 drachm, Sodium Bicarbonate 10 grains, Yolk of 1 Egg, Beef Tea 1½ ounces, Milk to 4 ounces.

Peptonoids of Beef (Gerrard).

Lean Beef, finely minced, 8 ounces, Pancreatin 60 grains, Sodium Bicarbonate 60 grains, Water 1 pint. Digest 3 hours at 130°F. with constant stirring; neutralise with hydrochloric acid, boil, strain and press the residue.

Beef Peptone with Malt.

Dose.—2 to 4 drachms. A palatable nutrient combination.

Pepsin Jelly.

Dose.—1 to 2 teaspoonfuls.

One drachm contains 3 grains Pepsin in a basis containing a small proportion of Hydrochloric Acid. This forms a savoury digestive to be taken with meals.

Pastilli Pepsinæ.

These are savoury in taste, contain 3 grains of Pepsin in each; suitable for taking at the commencement of a meal.

Tabellæ Pepsini. *Dose.*—1 or 2 with meals.

These have 3 grains of pepsin in each in combination with chocolate, they are portable and palatable.

Tabellæ Pepsini et Bismuthi. *Dose.*—1 or 2.

Have 3 grs. bismuth oxynitrate added to the above.

Tablets of Pepsin, compressed, 3 grains (0·2 Gm.).

Peptonising Pills (Benger), have similar action.

Vinum Pepsinæ, B.P.C.

Dose.—1 to 2 drachms (3·5 to 7 Cc.) with meals.

Pepsin 320 grains, Hydrochloric Acid 2 drachms, Glycerin 1 ounce, Sherry *q.s.* to 1 pint.

P. Austr.—Dissolve Gelatin 1 in Hot Water 20, and

mix with White Wine 752, Cognac 100. Allow to stand 24 hours, add a solution of Pepsin 25, Simple Syrup 100, Dilute Hydrochloric Acid (P. Austr. 12·5%) 3, allow to stand 8 days and filter.

U.C.H. has Pepsin 3, Diluted Hydrochloric Acid 3, Sherry 60, macerate 2 days and filter.

NOTE.—For sale without a Wine Licence in the United Kingdom, Pepsin Wines must contain 1 *of Hydrochloric Acid* (*B.P.*) *in* 80 *of the total product.*

Ingluvin. *Dose.*—5 to 10 grains (0·32 to 0·65 Gm.) is a special Pepsin said to be prepared from the gizzard of the fowl; it has been chiefly used to allay the sickness of pregnancy.

PHOSPHORUS (*Off.*) U.S.

P = 30·8 (30·77 U.S. Wts.; 31·0 I. Wts.).

Dose.—$\frac{1}{100}$ to $\frac{1}{20}$ grain (0·00065 to 0·0032 Gm.).

Phosphorus is obtained by converting Calcium Phosphate into the soluble Superphosphate by heating with Sulphuric Acid; this is reduced to metaphosphate by heating with charcoal and finally by further heat is converted into normal Calcium Phosphate with evolution of vaporised Phosphorus.

A wax-like, semi-transparent, non-metallic, poisonous element melting at 110° F., igniting at a slightly greater heat, and forming white fumes of phosphoric anhydride.

Soluble about 1 in 320 of absolute alcohol, about 1 in 200 of ether, about 1 in 25 of chloroform, about 1 in 100 each of oleic acid, almond, olive, castor, theobroma oils, and suet; in half its weight of carbon bisulphide and almost insoluble in water; combines chemically with oils of turpentine and peppermint, forming non-luminous and comparatively non-poisonous liquids. These, and other essential oils, are incompatible with Phosphorus.

Antidotes.—The best is Oil of Turpentine, especially French variety (from *Pinus maritima*) 30 minims every half-hour; also Potassium Permanganate 1% Solution *per os*, Hydrogen Peroxide Solution, Magnesium Sulphate ½ ounce. Copper Sulphate 3 grains, has been given as emetic.

Uses.—Phosphorus is a nervine tonic and stimulant—given for nervous prostration, paralysis agitans, loco-

motor ataxy and impotence. It is most useful in neuralgia —especially in aged persons, in leucocythæmia, and in some skin diseases. In psoriasis, chronic eczema, and lichen it acts somewhat like its chemical ally, arsenic.

Cases of tubercular meningitis, osteomalacia, diabetes and lymphadenoma have improved under the administration of Phosphorus. In otosclerosis use satisfactory. —Arch. Otol., August, 1905.

Perles or capsules of phosphorated oil are stable and active. Phosphorus in oil of theobroma or suet produces active pills (*v.p.* 549).

Amorphous or **Red Phosphorus**, if free from white Phosphorus, appears to be inert.

Preparations.

N.B.—All preparations of Phosphorus require to be kept from the light and in a cool place, and to be as carefully and freshly prepared as possible.

Alcoholic Solutions of **Phosphorus** have been employed medicinally; but, as the solubility is so slight, and as on adding water the Phosphorus is precipitated, such solutions are unsatisfactory.

Æther Phosphoratus, Teinture Ethérée de Phosphore (Codex, 1839).

Phosphorus, in small pieces, 4, Purified Ether, Sp. Gr. 0·720 (by weight), 200.

Macerate with frequent shaking in a dark place for a month and decant. About one-third of the phosphorus only is dissolved, it contains 1 in 150 (or 205 by measure). *Dose.*—1 to 10 minims (0·06 to 0·6 Cc.).

In neuralgia, 5-minim doses taken on the advent of an attack and repeated as required are useful.

Elixir Phosphori. *Adopted by B.P.C.*

Add Compound Tincture of Phosphorus (*v.p.* 551) 1 drachm, to Glycerin 4 drachms. *Prepare freshly.*

Dose.—15 to 60 minims (0·9 to 3·5 Cc.) in water. Contains $\frac{1}{50}$ grain in one drachm. As a fluid form of Phosphorus this is palatable and is well tolerated.

Oleum Phosphoratum (*Off.*).

Dose.—1 to 5 minims (0·06 to 0·3 Cc.), on sugar or in perles.

Contains about 1% (by weight) of Phosphorus in prepared almond oil; corresponds to the Codex preparation (1 in 50). That of P. Austr. contains only $\frac{1}{10}$%.

Capsules contain 5 minims of the oil = $\frac{1}{20}$ grain of Phosphorus.

Perles of Phosphorated Oil.

These contain $\frac{1}{100}$ grain, $\frac{1}{65}$ grain, and $\frac{1}{32}$ grain.

Phosphorated Cod Liver Oil.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

Is prepared by adding 160 minims of Phosphorated Oil, B.P., to a pint of cod liver oil. It contains $\frac{1}{100}$ grain in one drachm. It is a useful combination, but somewhat unpalatable, hence may conveniently be given in Capsules, containing half and one drachm respectively.

Pilula Phosphori (*Off.*).

Dose.—1 to 2 grains (0·065 to 0·13 Gm.).

Phosphorus 1, White Beeswax, melted, 12·5, Lard, melted, 12·5, Kaolin 11·5, Carbon Bisulphide 3·3 or *q.s.* Place the melted wax and lard in a slightly warmed mortar and stir until of the consistence of cream. Dissolve the phosphorus in the carbon bisulphide, mix with the melted fats, and add the kaolin. This mixture is to be kept under water in a bottle, from which light is excluded, and when dispensed, three parts are to be mixed with one part of gum acacia in powder to make 2% mass. The pills should be varnished.

Pilula Phosphori (*Martindale*).

Dose.—1 to 3 grains (0·065 to 0·2 Gm.).

Phosphorus 1 and Oil of Theobroma *q.s.* to 100.

Heat the oil to 300° F. and sustain the heat for 5 minutes. Strain and weigh 99 into a wide-necked bottle with an indiarubber cork, and when cooled to 130° F. add the Phosphorus, cork and shake well till the fat begins to solidify. In rolling it into pills, divide into suitable lots, and beat each in a mortar to render it plastic before applying it to the machine, then work off quickly and cover with sandarach solution. The mass contains 1% of Phosphorus in perfect solution. It should be kept from the light. A few drops of chloroform added during manipulation checks oxidation. When Phosphorus is to be combined with other ingredients in a pill, a more concentrated fatty basis is to be

preferred. The following will contain about 10% of Phosphorus:—

Sevum Phosphoratum, 10%. (Martindale.)

Phosphorus 1, Pure Carbon Bisulphide 5. Dissolve and add Prepared Suet (prepared by melting and straining, *Off.* and U.S.) 9.

Add a little of the suet at first, mix quickly, add the remainder, mix thoroughly and allow the bisulphide to evaporate. This basis may be used to make the following pills, any of which may be given, directly after meals. They are perfectly stable as there is no interaction or decomposition.—B.M.J. i./02,578; P.J. i./02, 224.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Ferro** (3 grs.).

Phosphorated Suet 10 grains, Reduced Iron 150 grains, Compound Tragacanth Powder 10 grains, Chloroform 15 minims (prevents phosphorescence and oxidation). Mix, and add quickly, Mucilage of Acacia *q.s.*

Divide into 50 pills (or into 750 pills if the quantities be taken in grammes). Cover with Sandarach Solution.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Ferro** (3 grs.) **et Nuce Vomica** ($\frac{1}{3}$ gr.).

Make as last, with $\frac{1}{3}$ grain Nux Vomica Extract.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Nuce Vomica** ($\frac{1}{3}$ gr.). Prepare as the last pills, replacing the reduced iron by one grain of milk sugar in each.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Quinina** (1 gr.).

Phosphorated Suet 10 grains, Quinine (base) 38 grains (= 50 grs. Sulphate), Chloroform 20 minims. Mix quickly, and add Compound Tragacanth Powder 10 grains, Mucilage of Acacia *q.s.* Mix, and divide into 50 pills (or into 750 pills if the quantities be taken in grammes).

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Quinina** ($\frac{1}{2}$ gr.) **et Ferro** (3 gr.).

Make as last, using half the quantity of quinine there ordered, and adding 3 grains Reduced Iron to each pill.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Quinina** ($\frac{1}{2}$ gr.), **Ferro** (3 grs.), **et Strychnina** ($\frac{1}{40}$ gr.).

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Strychnina** ($\frac{1}{40}$ gr.). Prepare as Pilula Phosphori cum Quinina, with Strychnine $1\frac{1}{4}$ grains *vice* Quinine 38 grains.

Pilula Phosphori ($\frac{1}{50}$ gr.) **cum Strychnina** ($\frac{1}{40}$ gr.) **et Ferro** (3 grs.).

Prepare as Pilula Phosphori cum Strychnina, adding 3 grains Reduced Iron to each pill.

Tinctura Phosphori Composita. *Adopted by B.P.C. Dose.*—3 to 12 drops on sugar.

Phosphorus 1, Chloroform 100. Warm gently in a stoppered bottle till dissolved, and add the solution to Absolute Alcohol 500. Shake well and keep in the dark. Contains 1 in 600. Becomes acid on keeping.

Zinci Phosphidum, Zn_3P_2=256·33 (258·2 I. Wts).

Dose.—$\frac{1}{20}$ to $\frac{1}{3}$ grain (0·0032 to 0·02 Gm.).

A grey crystalline powder. About $\frac{1}{4}$ its weight is phosphorus. With acids yields phosphoretted hydrogen.

Pilula Zinci Phosphidi. $\frac{1}{6}$ grain prepared by levigation with milk sugar and glycerin of tragacanth.

The **Hypophosphites** of Ammonium, Calcium, Iron, Potassium, and Sodium are all readily ignited when brought in contact with a naked flame.

Uses.—As nervine tonics, and specially serviceable in the incipient stages of phthisis, where there is little tendency to hæmorrhage. The Calcium salt is particularly useful in checking night-sweats, also for acne.

Acidum Hypophosphorosum, B.P.C., U.S.

$$O=P\begin{cases}H\\H\\OH\end{cases}=65{\cdot}56\ (66{\cdot}024\ \text{I. Wts.};\ 65{\cdot}53\ \text{U.S. Wts.}).$$

Dose.—2 to 5 minims (0·12 to 0·3 Cc.).

A colourless liquid, containing 30% of hypophosphorous acid. Method of manufacture is given in B.P.C. Determination of purity of hypophosphites.—Y.B.P. 1898, 409–423.

On heating, water evaporates and decomposes at 130° to 140° C., forming hydrogen phosphide, which ignites, and phosphorous acid. The latter decomposes at 160° to 170° C. into hydrogen phosphide and phosphoric acid, finally the last portions of unoxidised phosphorus burn out at a higher temperature (U.S.).

Acidum Hypophosphorosum Dilutum, U.S.

Average dose.—8 minims.

Is 10% strength. Sp. Gr. 1·042 at 25° C. Made by diluting the above with twice its weight of water.

Uses.—Its Salts are mostly employed. It may be added to Syrup of Ferrous Iodide to preserve same.

Ammonii Hypophosphis. $OP\begin{cases}H\\H\\O.NH_4\end{cases} = 82{\cdot}5$
(83·088 I. Wts.).

Dose.—1 to 6 grains (0·065 to 0·4 Gm.).

In white deliquescent tabular crystals, soluble 5 in 6 of water. Insoluble in alcohol. It has a nauseous saline taste. ***Incompatible*** as the Calcium Salt.

Calcii Hypophosphis (*Off.*). **U.S.**

$Ca\ (PH_2O_2)_2 = 168{\cdot}83$ (170·132 I. Wts.; 168·86 U.S. Wts.).

Dose.—3 to 6 (or 10, B.P.) grains (0·2 to 0·65 Gm.).

A white crystalline salt, with a bitter, nauseous taste, soluble 1 in 7 of water. It is prepared by heating phosphorus with milk of lime until phosphoretted hydrogen ceases to be given off, then filtering and evaporating to crystallise or precipitating with alcohol. Nervine tonic and aphrodisiac.

Incompatible with oxidising agents, and with Potassium Iodide.

Mistura Calcii Hypophosphitis, St. M.'s. H.

Calcium Hypophosphite 5 grains, Saccharated Lime Solution 1 drachm, Peppermint Water to 1 ounce.

Syrupus Calcii Hypophosphitis, B.P.C.

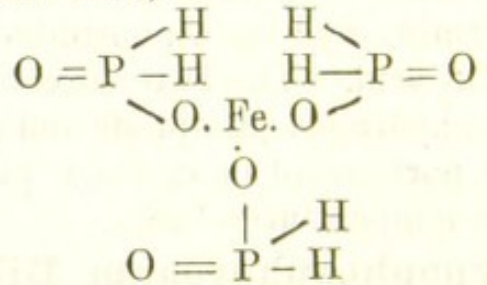
Dose.—1 to 4 drachms (3·5 to 15 Cc.). Each drachm contains about 1 grain of the hypophosphite.

Calcium Hypophosphite 160 grains, Distilled Water 9 ounces. Dissolve, filter, and add Sugar 1 pound. Dissolve with a little heat, and add Hypophosphorous Acid 20 minims, Distilled Water *q.s.* to 1 pint.

Ferri Hypophosphis, **U.S.**

$Fe(PH_2O.O)_3 = 249{\cdot}28$ (250·948 I. Wts.; 249·09 U.S. Wts.).

$$\begin{array}{c} O=P\begin{cases}H\\H\\O.\,Fe.\,O\end{cases} \quad \begin{cases}H\\H\\O\end{cases}P=O \\ \dot{O} \\ |\ \ \begin{cases}H\\H\end{cases} \\ O=P-H \end{array}$$



Syn. FERRIC HYPOPHOSPHITE.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) in a pill.

In commerce is a whitish amorphous powder with a

chalybeate taste, only slightly soluble in water, but more soluble with addition of Potassium Citrate.

Ferrous Hypophosphite,

$Fe(PH_2O.O)_2+6H_2O=292{\cdot}0$ (294·028 I.Wts.).

Greenish Crystals; not permanent. Prepared by dissolving Iron in Hypophosphorous Acid or by double decomposition between Calcium Hypophosphite and Ferrous Sulphate. The resulting solution to crystallise must be evaporated in vacuo. Soluble about 1 in 8 of water when freshly prepared.

Liquor Ferri Hypophosphitis Fortis, B.P.C.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

Dissolve Ferric Chloride 1,000 grains, Sodium Hypophosphite 1,100 grains, each in 10 ounces of water, add latter solution to former, collect precipitate, wash it until nearly free from chloride and dissolve it in the following Solution (which should be distinctly alkaline in reaction):—Strong Solution of Ammonia 360 minims, Citric Acid 800 grains, Distilled Water 5 ounces. Estimate the Ferric Oxide obtained from 10 Cc. of the solution by precipitation with potassium hydrate after washing, drying and igniting; multiply weight in Gms. by 137·1 to obtain amount of Iron expressed as Ferric Hypophosphite in grains per ounce and adjust by adding water *q.s.* Contains Iron equal to 40 grains of Ferric Hypophosphite in 1 ounce.

Liquor Hypophosphitum Compositus, B.P.C.

Syn. LIQUOR FERRI HYPOPHOSPHITIS COMPOSITUS.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Calcium Hypophosphite 320 grains, Sodium Hypophosphite 320 grains, Magnesium Hypophosphite 160 grains, Strong Solution of Ferric Hypophosphite 6 ounces, Distilled Water *q.s.* to 1 pint. Dissolve and mix. Each drachm contains about 2 grains each of the sodium and calcium hypophosphites, ½ grain magnesium hypophosphite, and 1½ grains of ferric hypophosphite. Forms a much more useful 'chemical food' for children than Parrish's preparation.

Syrupus Ferri Hypophosphitis, B.P.C.

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

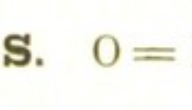
Strong Solution of Ferric Hypophosphite 4 ounces, Syrup 16 ounces.

Pilula Ferri Hypophosphitis cum Strychnina.

Strychnine $\frac{1}{30}$ grain, Ferrous Hypophosphite 2 grains. To make one pill (or in grammes to make 15).

Dose.—1 twice or thrice daily.

Potassii Hypophosphis, U.S.



$= 103{\cdot}39$ (B.P. and U.S. Wts.) (104·166 I.Wts.).

Dose.—1 to 6 grains (0·065 to 0·4 Gm.).

A deliquescent granular white powder, having a nauseous, bitter taste. Soluble 1 in 1 of water.

Incompatible as the Calcium Salt.

Sodii Hypophosphis (*Off.*). $O = P\begin{cases} H \\ H \\ ONa \end{cases} = 87{\cdot}44$

(87·066 I. Wts.) ($+H_2O$, U.S. = 105·29 U.S. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

A white granular deliquescent salt, with a bitter nauseous taste. Soluble 1 in 0·63 of water.—P.J. i./02,552; and freely soluble in alcohol. With an equal quantity of Sodium Nitrate is explosive. Further incompatible as the Calcium Salt.

Syrupus Sodii Hypophosphitis. B.P.C.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

Sodium Hypophosphite 160 grains, Distilled Water 3 drachms. Dissolve, filter, wash the filter with 1 drachm of distilled water, and add Syrup *q.s.* to 1 pint.

Syrupus Hypophosphitum Compositus. B.P.C. *Dose.*—½ to 2 drachms (1·8 to 7 Cc.).

Dissolve Strychnine 1 grain in Hypophosphorous Acid (30%) 2 drachms, and add to a solution of Calcium Hypophosphite 80 grains, Manganese Hypophosphite 40 grains, Potassium Hypophosphite 40 grains, and Quinine Hypophosphite 20 grains in Distilled Water 8 ounces. Dissolve, filter, and add Strong Solution of Iron Hypophosphite 1 ounce, Refined Sugar 14 ounces, dissolve without heat, then add Chloroform 20 minims, Alcohol (90%) 40 minims. Shake, and lastly add Distilled Water *q.s.* to 1 pint.

It is well to supply this preparation in amber bottles.

In phthisis and like cases, hypophosphites raise the nervous power and improve condition of the secretions.

Tablets of Compound Hypophosphites each equivalent to ½ drachm of the above are prepared.

Syrupus Hypophosphitum Compositus, U.S.

Average dose.—2 drachms.

Ferric 2·25, and Manganese Hypophosphite 2·25, with Sodium Citrate 3·75 are first dissolved in Water 30, then Calcium 35, Potassium 17·5, and Sodium Hypophosphites 17·5 are dissolved in water 450, with Diluted Hypophosphorous Acid 5. Quinine (base) 1·1 and Strychnine (base) 0·115, with Hypophosphorous Acid 10 are then dissolved in water 30. Finally, Sugar 775 is dissolved in the mixed solutions and made up to 1,000 with water.

Syrupus Hypophosphitum Compositus. *(American.)* *Dose.*—1 drachm (3·5 Cc.)

The following formula has been published, based on an analysis; the product much resembles the advertised preparation:—Iron Pyrophosphate (Sodio-citro-ferric Pyrophosphate) 15 grains, Sodium Hypophosphite 45 grains, Strychnine (dissolved with a drop or two of Diluted Sulphuric Acid) ½ grain, Manganese Hypophosphite 15 grains, Quinine Sulphate 5 grains, Distilled Water 1 ounce. Heat gently to dissolve, without further addition of acid, and add to Syrup *q.s.* to weigh 16 ounces.

This syrup deposits in time. Ferric hypophosphite has been suggested as a substitute for the iron pyrophosphate, but our experiments in this direction were not convincing. We can, however, with confidence recommend the Compound Syrup of the new U.S. (*vide p.* 554). A sample kept under observation, however, had deposited slightly at the end of 4 months.

Great care must be taken to distinguish these preparations which contain strychnine from the following, which contains none:—

Syrupus Hypophosphitum, U.S., has Hypophosphite of Calcium 45, of Potassium 15, of Sodium 15 with diluted Hypophosphorous Acid 2, Sugar 650, Tincture of Fresh Lemon Peel (U.S.) 5 (freshly grated Lemon Peel 1, Alcohol *q.s.* to 2), Water *q.s.* to 1,000. *Average dose.*—2 drachms.

An American syrup sold as **Hematic Hypophosphites** is similar, but contains strychnine hypophosphite ¼ grain in 1 ounce.

Ferri Pyrophosphas Solubilis, U.S.

Contains ferric pyrophosphate corresponding to not less than 10% metallic iron. *Average dose.*—4 grains.

Glycerol Hypophosphitum. Glycerol of Hypophosphites. *Dose.*—1 drachm (4 Cc.).

Dissolve Calcium Hypophosphite 160 grains, Manganese Hypophosphite 80 grains, Potassium Hypophosphite 160 grains, Quinine Hypophosphite 80 grains, Strychnine Hypophosphite 2½ grains in Distilled Water 2 ounces, and add Strong Solution of Ferric Hypophosphite (B.P.C.) 4 ounces, Hypophosphorous Acid 2 ounces, Glycerin to produce 20 ounces. Each drachm contains Strychnine Hypophosphite $\frac{1}{64}$ grain, and Quinine Hypophosphite ½ grain.—P.J. i./06,385.

Quinum Hypophosphitum Compositum, V.C.H. *Dose.*—1 drachm for a child 1 year old.

Solution of the Hypophosphites 20, Syrup 20, Alcohol 10% 8, Caramel 1, Water to 120.

Wheat-Phosphates, Saccharated, the soluble part of bran—the organic phosphates and cerealin (ferment of bran) combined with milk sugar—are specially useful in weakly and rickety children, and where digestion

is impaired seem to aid the assimilation of food and even of such medicines as iron.

Dose.—Half a teaspoonful (increased) 2 or 3 times a day, may be taken as sugar with food.

Phytin. An organic phosphorus compound (calcium and magnesium phosphates with oxymethylene diphosphoric acid). A nervine tonic. Capsules 4 grains.—B.M.J. i./05,81; B.M.J.E. i./05,28; L. i./06,38.

PHYSOSTIGMATIS SEMINA.

Calabar Bean (*Off.*). **U.S.** *Syn.* ORDEAL BEANS, from West Africa.

Dose, in powder.—1 to 4 grains (0·065 to 0·26 Gm.). U.S. *average dose* $1\frac{1}{2}$ grains.

The poisonous properties of the ripe seed of *Physostigma venenosum* (*Leguminosæ*) are chiefly due to Physostigmine, which is contained in the cotyledons only, the content being about 0·25% or less. In addition Eseridine and Eseramine are said to be constituents.

U.S. requires 0·15% Ether—soluble alkaloids.

Assay Method, U.S.—20 Gm. of the drug in No. 60 powder are shaken with Ether. Sodium Bicarbonate Solution is added, and the mixture shaken at intervals during four hours. Decant half the Ether originally taken and wash out with repeated quantities of Sulphuric Acid and Water. Shake out the combined acid liquids with Ether twice in the presence of sufficient Sodium Bicarbonate. Evaporate Ethereal Solution and dissolve the residue in a volume of $\frac{N}{10}$ Sulphuric Acid and a small quantity of Ether. Titrate the excess of acid with $\frac{N}{50}$ caustic potash, using Iodeosin as indicator. The factor 0·0273 is given as representing the amount in grammes of alkaloids (mostly physostigmine) required to neutralise 1 Cc. of $\frac{N}{10}$ Sulphuric Acid.

Uses of Physostigma.—Preparations of Physostigma and solutions of its alkaloid Physostigmine $\frac{1}{4}$ to 1%, applied topically to the eye, contract the pupil, and are antagonistic to atropine.

For tetanus the dose of extract given by the mouth, rectum, or hypodermically, should be repeated, and increased every hour, so as to paralyse little short of arresting the breathing. For chorea also it is given in smaller doses. In paralysis it arrests muscular wasting and improves muscular power. In hemiplegia or paraplegia, give doses of $\frac{1}{30}$ to $\frac{1}{10}$ grain frequently.—R.

The action of this drug is in many respects similar to that of pilocarpine.—Dixon.

Antidotes.—Emetics, Atropine or Belladonna, Chloral, Strychnine, Tannin.

Extractum Physostigmatis (*Off.*).

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.), in cases of tetanus may be given every hour and increased.

An alcoholic extract containing three-fourths of its weight of milk sugar. Yield about 2 to 5%.

Alkaloidal content varies very considerably. U.S. (in powder form) standardises to contain 2·0% ether-soluble alkaloids. For outline of estimation process see above.

A **powdered extract** is supplied in commerce containing 5% Physostigmine.

Traumatic tetanus has been well treated with Calabar bean extract; $\frac{1}{8}$ grain every hour, then $\frac{1}{2}$ grain every 2 hours.

Tinctura Physostigmatis, B.P.C.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Calabar Bean, in No. 40 powder, 1, Alcohol 90% *q.s.* to 5 (U.S. has 1 in 10 of Alcohol 94·9% vol.).

It is antagonistic to strychnine, but is *not* dependable on as a remedy for poisoning by nux vomica or strychnine.

Physostigmina. *Syn.* ESERINE.

$C_{15}H_{21}N_3O_2 = 273·23$ (275·288 I. Wts.).

Dose.—$\frac{1}{100}$ to $\frac{1}{50}$ grain (0·00065 to 0·0013 Gm.).

The alkaloid is in large colourless rectangular crystals, slightly soluble in water, freely in ether, soluble 1 in 180 of vaseline. Solution in castor oil, $\frac{1}{2}$ to 1% (by weight) is used. Has the advantage of not oxidising—turning pink—so readily as the solutions of the salts.

In glaucoma the above Alkaloidal Oil 2 to 4 grains per ounce, preferred to aqueous solution.—M.A. 1906,227.

Isophysostigmine.

An alkaloid very similar to and used like physostigmine, but is one-third stronger in effect and acts longer.—Therapie der Gegenwart, "Ocular Therapeutics," M.P., Aug. 1905.

Unguentum Physostigminæ, R.O.H.

Physostigmine 0·25, Soft Paraffin 100; heat to dissolve.

Physostigminæ Hydrobromidum.

$C_{15}H_{21}N_3O_2.HBr = 353·58$ (356·256 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain (0·0011 to 0·0032 Gm.).

A whitish amorphous powder, as met with in commerce, slightly hygroscopic, very soluble in water.

Physostigminæ Salicylas, U.S., P. Austr.

$C_{15}H_{21}N_3O_2.C_6H_4.(OH)\,COOH = 410{\cdot}24$ (413·336 I. Wts.; 410·21 U.S. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain (0·0011 to 0·0032 Gm.).

In colourless, shining, needle-shaped, or short columnar crystals. A stable salt, soluble 1 in 140 of cold water; much used as a myotic solution. Not so liable to turn pink as solution of the sulphate.

Tablets, Hypodermic $\frac{1}{500}$ grain.

In glaucoma suited for prolonged use.—Oph., May 1905.

Physostigminæ Sulphas, (*Off.*). P.G. U.S.

$(C_{15}H_{21}N_3O_2)_2\,H_2SO_4 = 643{\cdot}80$ (648·652 I. Wts.; 643·75 U.S. Wts.). (*Off.* + Aq.)

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain (0·001 to 0·0032 Gm.).

In yellowish white granular crystals, deliquescent and soluble about 4 in 1 of water, forming a solution, which becomes pink in a few days, but does not lose much in efficacy.

The formation of Rubeserine is *said* to set up inflammation of the conjunctiva, but Saul (P.J. i./87,642) proved that the colouration is due to oxidation and not to ammonia of the air forming Rubeserine.

In doses of $\frac{1}{100}$ grain (0·00065 Gm.) of value in tympanites as occurring in typhoid fever.—M. 01,150.

Guttæ Physostigminæ, St. Th. H.

Contain 0·5, or 1%. St. M.'s H. 0·5%.

Guttæ Physostigminæ cum Cocaina, R.O.H

Physostigmine Sulphate 0·25, and Cocaine Hydrochloride 1, Water to 100. St. M.'s H. 0·25, 1·25 in 100.

Guttæ Physostigminæ et Quininæ. Liverpool Eye and Ear Infirmary.

Physostigmine Sulphate 1 grain, Quinine Sulphate (Bisulphate) 4 grains, Distilled Water 1 ounce.—B.M.J. i./04,452.

Injectio Physostigminæ Sulphatis Hypodermica, 1% *Dose.*—1 to 4 minims (0·06 to 0·24 Cc.).

Lamellæ Physostigminæ, Discs of Physostigmine. (*Off.*)

Each contains $\frac{1}{1000}$ grain (0·065 milligramme) of Physostigmine Sulphate; also prepared containing $\frac{1}{250}$ grain and $\frac{1}{500}$ grain respectively, for ophthalmic use. Also $\frac{1}{1000}$ grain, combined with Cocaine $\frac{1}{200}$ grain.

'**Sterules**' of Physostigmine Sulphate Solution 4 grains to the ounce are prepared, also '**Sterules**' of Physostigmine Sulphate 1 grain with Cocaine Hydrochloride 4 grains to the ounce.

Unguentum Hydrargyri Oxidi Flavi cum Physostigmina, R.O.H.

Physostigmine 0·25, Soft Paraffin or Lanoline (anhydrous) 100; heat till dissolved, and add, when cold, Yellow Mercuric Oxide 1.

For corneal ulcers in scrofula, solution of 2 grains to an ounce may be dropped into the eye; also in mydriasis and glaucoma. In glaucoma Eserine is indicated, in iritis Atropine.— Pr. xxxi.321. Ocular pressure increased by its use.—L. ii./86,183.

PICROTOXINUM. (*Off.*).

$C_{45}H_{50}O_{19} = 887{\cdot}67$ (894·4 I. Wts.), probably consisting of 2 molecules of Picrotoxinin $C_{15}H_{16}O_6 = 289{\cdot}93$ (292·128 I. Wts.), with 1 molecule of Picrotin $C_{15}H_{18}O_7 = 307{\cdot}81$ (310·144 I. Wts.). Picrotin is said to be comparatively inert.

Dose.—$\frac{1}{100}$ to $\frac{1}{25}$ grain (0·00065 to 0·0026 Gm.).

A neutral crystalline principle obtained from the fruits of *Anamirta paniculata* (*N. O. Menispermaceæ*)—or Cocculus Indicus (growing on the Malabar Coast); does not form salts. Nearly entirely soluble 1 in 330 of water, and 1 in 13 of alcohol 90%, and about 1 in 500 of fats; its taste is bitter.

Uses.—Gives good results in checking night-sweats (does not like Atropine cause dryness of throat), also employed in epilepsy and chronic alcoholism; overdoses cause stupor, delirium, and convulsions (by acting on the medulla).

The primary action of Picrotoxin is to increase the secretion of the mucous and perspiratory glands. Its action in checking night sweats is explained by Cushny as probably due to its increasing the respiration and thus preventing that stimulation of the nervous mechanism of perspiration which occurs through the partial asphyxia.—M. Arch., 1905,308.

Antidotes.—Administer emetics, use the Stomach Tube, and then give Chloral and Potassium Bromide, then stimulants.

Injectio Picrotoxini Hypodermica.—1 in water 360. *Dose.*—3 to 6 minims (0·18 to 0·35 Cc.).

Liquor Picrotoxini Aceticus.

Picrotoxin 1, Glacial Acetic Acid 30. Dissolve and add Distilled Water to 250. Filter.

Dose.—2 to 12 minims (0·12 to 0·7 Cc.) in water.

Is palatable and keeps in solution at all temperatures.

Pilula Picrotoxini.

Picrotoxin $\frac{1}{30}$, $\frac{1}{50}$, $\frac{1}{60}$, or $\frac{1}{100}$ grain. Forms a suitable dose for checking night-sweating of phthisis taken for 2 or 3 nights successively, it is slightly cumulative, may thus be temporarily stopped with effects persisting.

A pill of Picrotoxin $\frac{1}{60}$ grain, Atropine $\frac{1}{120}$ grain with Agaricin $\frac{1}{12}$ grain, is said to act even better.

Unguentum Picrotoxini. Picrotoxin 10 grains to Lanolin Ointment 1 ounce is used (on sound skin only) for parasitic skin affections to kill lice: for this purpose also ½ ounce of Tincture of Cocculus Indicus (1 in 5 Alcohol 60%) added to 4 ounces of water is dabbed on to the scalp; it must be washed off, however, after a few minutes.—M. Arch., 1905,308.

PILULÆ.

One of the principal considerations in the production of a pill is the choice of the excipient, which must be compatible with the other ingredients. The mass should be made hard enough to maintain the shape of the pill.

Glycerin as an excipient, if used at all, is best mixed with alcohol, and is unsuited for hygroscopic drugs, such as soft extracts, squills, aloes, &c. For pills intended to be varnished, use equal parts acacia and tragacanth, with syrup *q.s.* For hygroscopic drugs mucilage of acacia or syrup is preferred, and tragacanth in moderation is very useful as a 'hardener.' For insoluble metallic salts, glycerin of tragacanth may be employed (*v.p.* 703), adding if necessary, a small quantity of powdered acacia or althæa to give firmness.

For Oils, soap is best used, *c.f.* Pilula Creosoti, *p.* 303.

In the official Pill masses **Syrup of Glucose** (*Off.*) is employed; this is prepared by heating Glucose (syrupy) 1, with Simple Syrup 2 (by weight).

Glucantha, *v.p.* 703.

As a means of rendering pills tasteless, silvering or gilding is giving place to covering them with solution of sandarach, gelatin, or pearl-coating them with French chalk and gum, or sugar-coating them.

Varnishing Pills.—The late W. Martindale suggested the use of a sandarach solution—1 part sandarach*

*Resin from *Callitris quadrivalvis* (*Coniferæ*). *Alcohol Sandarachi*, R.D.H. For dental use. Sandarach 2, Alcohol (90%) 1. **Copal Solution.** *Syn.* ETHER CÒPAL. Copal 1, Ether 1, dissolve. For covering cement fillings to protect them from the immediate action of the saliva.

in 1 part of absolute alcohol (= Pill Varnish). The pills should be free from powder, as every imperfection will show through the transparent coating. Having placed them in a covered pot, a few drops of the sandarach solution are added and diffused equally by a few circular movements of the pot. They are then poured out on a plate and detached from each other. Shortly afterwards they are moved carefully with a pointed glass rod dipped in alcohol. In about 20 minutes they will be dry, but should be exposed to the air an hour or so more.

In **coating** Pills with **Gelatin**, they should be free from powder, and not too dry. A solution is prepared by dissolving 1 part of gelatin in 4 parts of water, straining whilst hot through fine muslin, allowing to cool and re-heating to get rid of air bubbles. The pills are stuck on the points of fine needles and dipped into the solution, kept hot by a water bath; as they are taken out, each needle is slowly revolved to make the coating even on the pill, the reverse end of the needle is then stuck into a sheet of cork or pincushion, and the needles are left in this upright position till the pills are dry—in about ½ hour.

The **gelatin-coated** pills of commerce (without the pin points) are made by holding them in a frame by suction, half the pill is then dipped, allowed to dry, and then the other half is coated after transferring to a corresponding mould beneath.

In **pearl-coating**, the Pills are first evenly covered with a mucilage of tragacanth 4 grains to 1 ounce with half a drachm of syrup added; they are then thrown into a covered pot having a concave bottom and containing some finely powdered French chalk; after gently rotating them in this for a few seconds they are turned into a third similar pot and rotated slowly; the excess of powder is then blown off, and they are finished by shaking round until even and polished.

The **sugar-coating** of Pills can only be done successfully in large quantities, and the pills must be hard and dry; they are placed in a hemispherical metallic pan kept warm, while making eccentric revolutions, and are alternately moistened with syrup, and dusted with finely-powdered sugar, till dry and uniformly covered.

Keratin-coating of Pills is performed for the purpose of rendering them insoluble in the gastric juice, so that they pass into the intestine unchanged. Their action

is thus localised. For this purpose, only oily excipients should be used, and the pills covered with a thin layer of cacao-butter previous to applying the **Keratin Solution.** The latter is made by removing from horn shavings all that is soluble in pepsin and diluted hydrochloric acid. The residue dissolved in weak alcoholic solution of ammonia, and evaporated to a mucilaginous consistence, forms the gum-like liquid, keratin solution. The pills require at least three coatings with this liquid, and so prepared they are freely soluble in the alkaline liquid in the intestine; and, although insoluble in the acid gastric juice, their coating is partially soluble in acetic and citric acids, which should not be taken at the same time.

Keratin Solution can also be made from feather stems. The solution can be scaled, and the scaled substance re-dissolved in acid or ammonia for pills of different composition, *e.g.* :—

Acid for Silver, Gold, Mercury, Ferric Chloride, Arsenic, Salicylic Acid, Santonin, Tannin, Thymol.

Alkaline for Pancreatin, Trypsin, Ferrous Sulphate, Alkalis. For some drugs, *e.g.*, Naphthalin, either acid or alkaline solution, may be used.

Should be employed for pills containing substances which irritate gastric mucous membrane, neutralise acidity of stomach, or are desired to act on intestinal membrane without action on stomach, such as those intended to destroy worms.—L. ii./90,838.

A suitable coating for carbolic acid in pills to relieve diarrhœa.—L. ii./93,1305.

Salol Varnish for pills intended to act in intestines only, *v.p.* 65.

A revised list of pills in general request in London is contained in the index.

Cachets of wafer paper are useful for enclosing nauseous medicines, drugs that do not yield all their activity to any solvent, and those whose suspension in fluids is difficult or inaccurate owing to non-diffusibility or decomposition, or whose taste is disagreeable, such as

Antifebrin, Antipyrin, Bismuth Carbonate, Cascara, Compound Ipecacuanha powder, Charcoal, Guaiacol Carbonate, Guaiacum and Sulphur, Ichthoform, Methylene Blue, Naphthalin, Naphthol, Pepsin, Phenacetin, Quinine Sulphate, Rhubarb, Saccharated Ferrous Carbonate, Salicin, Salol, Sodium Salicylate, Sulphonal, Tannalbin, Trional.

Empty Gelatin (Hard) Capsules are short tubes closed at one end, telescoping into one another, used for a similar purpose.

Soft Gelatin Capsules are very useful for dispensing nauseating drugs, particularly oils, for list, *vide* Index.

Capsules are official in P. Austr. and Ph. Ned.

A pill, cachet, or, in fact, any medicine, should always be followed by a draught of water, to carry it quickly through the œsophagus.

PINUS.

Pinus Sylvestris. *Syn.* SCOTCH FIR OR PINE.

From the wood of this tree (principally in America, France, Russia and Germany) much of the oleo-resin, common turpentine, oil of turpentine, Gum Thus or American frankincense, resin or colophony and tar (*vide* Pix Liquida) are produced. From its leaves also are prepared an extract, volatile oil and wool. At certain establishments in Germany, a system of treatment of rheumatism and other diseases by baths, &c., known as the **Pine Cure,** is followed.

From **Oil of Turpentine,** which may be (B.P.) "rectified if necessary"—it is then commonly known as Camphine—are prepared :—

Capsules, 5 and 10 minims each. *Dose.*—1 or more.

In enteric fever a 10 minim capsule every two or three hours, or as emulsion with Spirit of Chloroform and Spirit of Nitrous Ether with good results.—B.M.J. ii./04,1450.

Its use in typhoid questioned.—B.M.J. i./05,414.

Emulsum Olei Terebinthinæ, U.S.

Average dose.—1 drachm (4 Cc.).

Emulsify Turpentine Oil 15, Almond Oil 5, Acacia 15, with water 30, add Syrup 25 in portions, and finally water to 100.

Another form :—Turpentine Oil and Quillaia Tincture, of each 20 minims, water to 1 ounce.—B. M. J. i./06,318,480

Enema Olei Terebinthinæ, St. M.'s H.

Turpentine Oil ½ ounce, Starch Mucilage to 10 ounces.

Enemata of Turpentine Oil with soapy water of great value for flatulent distension of the colon.—B.M.J. ii./04,1452.

Stokes' Liniment, N.F.

Turpentine Oil 100 Cc., yolk and white of one egg, Acetic Acid 20 Cc., Rose Water 85 Cc., Oil of Lemon 4 Cc.

Linimentum Terebinthinæ (*Off.*).

Oil of Turpentine 26, Camphor 2. Dissolve, and emulsify by adding gradually to Soft Soap 3, dissolved in Distilled Water 4. Then add Distilled Water *q.s.* to 40. U.S. has Resin Cerate, melted on water bath, 65, Oil of Turpentine 35.

Linimentum Terebinthinæ Aceticum (*Off.*).

Oil of Turpentine 4, Glacial Acetic Acid 1. Liniment of

Camphor 4. Resembles St. John Long's Liniment and other proprietary articles.

"Sanitas" Fluid, the aqueous solution resulting from the action of water upon air-oxidised turpentine, containing as its active principles hydrogen peroxide, thymol, a soluble camphor, and some camphoric acid. It is an oxidising agent and an antiseptic, is non-poisonous, does not stain linen, is useful for household disinfection and for surgical operations. **Toilet "Sanitas"** is similar, with an agreeable perfume. **"Sanitas" Oil** is an air-oxidised turpentine, the oxidation being conducted in the presence of water; it has Sp. Gr. 0·95. An organic peroxide is present in it, which gives it an oxidising strength equal to that of a ten-volume solution of hydrogen peroxide. It is largely used for the treatment of consumption and lung and throat troubles by inhalation in the so-called "Pine-Oxygen" treatment of those affections. In connection with this, **"Sanitas" Antiseptic Pastilles** and **"Sanitas" Pocket Spittoons** have recently been prepared. As an antiseptic it may be mixed with sawdust and sprinkled about, or diluted with alcohol or methylated spirit and sprayed in a room, or diluted 1 in 8 to 20 of olive oil for various surgical dressings and affections of the skin. Mixed with powdered acacia, then boldly diluted with water and well shaken, it forms a "Sanitas" emulsion which can be diluted further *ad lib.* for various purposes. **Soluble "Sanitas" Oil** emulsifies with water, and is also miscible with oils, fats, and petroleum bases. Is used of strength 1 in 20 to 50 of water as a disinfectant, and in the bath.

Fir Wool, or **Fir Wool Wadding,** sold in sheets, is a cotton wool, impregnated with the above; it has the faint, agreeable odour of the Pine-leaf, and is manufactured into blankets, jackets, spencers, stockings, &c. A Liquor is also obtained, which is employed for baths. On evaporation this yields—

Extractum Pini Sylvestris. Fir-Wool Extract.

A dark brown liquid like treacle, readily soluble in water and having a faint pine odour; 2 to 4 ounces are added to a 30-gallon warm bath for rheumatism.

Oleum Pini Sylvestris. Fir-Wool Oil.—*Syn.* Pine Needle Oil.

Distilled from the pine-leaf. For rheumatism applied by rubbing, the affected part being afterwards covered with warmed Fir-wool wadding; it was also added in quantities of a drachm or more to warm baths for the same disease. (*Now unobtainable.*)

Vapor Olei Pini Sylvestris (B.P. 1885 and **T.H.**).

Fir-Wool Oil 40 minims, Light Magnesium Carbonate 20 grains, Water to 1 ounce. One drachm to a pint of

water at 140° F. forms a mild stimulant inhalation in chronic laryngitis.

Oleum Pini, Oil of Pine (*Off.*).

Dose.—½ to 3 minims (0·03 to 0·18 Cc.).

The oil of the leaf of *Pinus Pumilio* (*Coniferæ*) possesses more agreeable odour and taste than the last. Is sold under the fancy names of Pinol and Pumiline, and is used for inhalations. Jujubes, pastilles, and soaps are also sold, medicated with the oil. About ⅘ of Pine Oil is soluble 1 in 5 of Alcohol 90%.

Syrupus Pini Pumilionis.

Dose.—1 drachm (3·5 Cc.).

Pine Oil 1 ounce, Alcohol 90% 5 ounces, Saffron Tincture 5 drachms, Glycerin 5 ounces, Syrup *q.s.* to 1 pint. Rub the Pine Oil with 3 ounces of Light Magnesium Carbonate, then add the Alcohol, Glycerin and Syrup in parts; filter.

Linctus Pini, Terpin et Heroin.—*Syn.* Elixir of Pine, Terpine and Heroin.

Dose.—1 drachm (3·5 Cc.). Contains $\frac{1}{48}$ grain Heroin Hydrochloride and ¼ grain of Terpine Hydrate.

Dissolve Terpine Hydrate 40 grains in the alcohol in above, and Heroin Hydrochloride 3⅓ grains in the Syrup, and proceed in other respects as above.

The '**Bournemouth Formulary**' has Heroin ½ grain, Terpine Hydrate 8 grains, Alcohol 90% 6 drachms, Syrup of Virginian Prune Bark 3 drachms, Glycerin 3 drachms. *Dose.*—½ to 2 drachms.

Glycogelatin Pastils are also prepared (*v.p.*370) containing each ½ minim of Pumilio Pine Oil with ⅛ Terpene Hydrate, and $\frac{1}{48}$ grain Heroin Hydrochloride.

Artificial Venice Turpentine may be produced by mixing Resin 17, Linseed Oil (boiled) 12, Oil of Turpentine 8, or by dissolving Resin in Oil of Turpentine; is mostly employed in the Arts. The true article exudes from the branches of the larch, *Pinus Larix*.

Hartmann's Wood Wool, and **Wood Wool Wadding** consist of finely-comminuted pine wood, rendered antiseptic with sublimate; they are very absorbent, and are now much used for dressing wounds, especially in the form of **Wood Wool Tissue**; and the wadding is formed into "**towelettes**" for ladies' use in menstruation and hæmorrhage, and into

accouchement sheets, gonorrhœa bags, vaccination pads and **sponges**; triangular pads are also made **(bapkins)** to assist in the cleanliness and comfort of infants, as well as **Sheets** and **Mattresses** for use in cases of cholera and other diseases with infective discharges.

PIPERAZINA.

DIETHYLENE-DIAMINE.

$HN<^{CH_2.CH_2}_{CH_2.CH_2}>NH$ or $(C_2H_4NH)_2$=
85·52 (86·16 I.Wts.)

Dose.—4 to 10 grains (0·26 to 0·65 Gm.), or 15 grains daily.

Manufactured by the action of sodium glycol on ethylene-diamine hydrochloride; colourless alkaline deliquescent crystals of saline taste, soluble about 4 in 7 of water. Melts at 104° to 107° C., B. Pt. 145° C.

Uses.—Given internally, is a powerful solvent of uric acid and urates in the system, and is successfully used as a remedy in cases of uric acid diathesis, such as gout, rheumatism, and urinary calculi; it is also reputed to have an aphrodisiac effect, to increase the flow of urine, and diminish the acidity and Sp. Gr.

Effervescent Piperazine contains 5 grains in a drachm. *Dose.*—1 drachm (4 Gm.).

Effervescent Piperazine with **Phenocoll.**

Dose.—1 drachm (4 Gm.).

Contains 5 grains of each in a drachm. A specific in painful rheumatic affections.

Piperazine Water, Aërated.

This contains 5 grains to the average tumblerful, or 15 grains to a syphon, and is a pleasant and efficacious mode of administration.

Tablets of Piperazine.

Contain 5 and 15 grains (0·32 Gm. and 1 Gm.). One of the latter in water forms a day's medication.

Beneficial action in gout not due to solvent action on material of gouty concretions.—L. ii./92,131; B.M.J. ii./92,64; i./96,1432; ii./99,1792.

It inhibits, in diabetics, the transformation of glycogen into sugar.—B.M.J.E. ii./93,72.

Complete success as a remedy for renal colic.—L. ii./93,1661; B.M.J.E. i./93,75.

'Vescettes' of Piperazine, 5 grains (0·32 Gm.) to be crushed and taken in a draught of warm water.

Piperazine Acid Glycerophosphate.

$$\begin{array}{l} \diagup OH \text{———} C_4H_{10}N_2 \text{———} HO \diagdown \\ PO-OH \qquad\qquad\qquad\qquad HO-OP,H_2O = \\ \diagdown O.C_3H_5(OH)_2 \; (HO)_2C_3H_5O \diagup \end{array}$$

445·02 (448·32 I. Wts.).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

A granular white salt, ***soluble*** in water, manufactured by evaporating equivalent quantities of the base and acid.

Piperazine Neutral Glycerophosphate.

$$\begin{array}{l} \diagup OH-C_4H_{10}N_2 \\ PO-OH \\ \diagdown O.C_3H_5(OH)_2 \end{array} = 256{\cdot}33 \; (258{\cdot}232 \text{ I. Wts.}).$$

Similar in appearance to the above, melting at 155° C. manufactured by precipitating alcoholic solutions of equimolecular weights of the acid and the base.—P.J. i./05,693. These salts are recent introductions and are suggested for clinical trial.

Piperazine Benzoate and **Salicylate** are crystalline salts.—J.C.S.A. April, 1906, 309.

Lycetol.—DI-METHYL-PIPERAZINE TARTRATE.

$$CH_3N\left\langle\begin{array}{l}CH_2.CH_2\\CH_2.CH_2\end{array}\right\rangle N.CH_3.\left\{\begin{array}{l}CHOH.COOH\\CHOH.COOH\end{array}\right. =$$

262·26 (264·24 I. Wts.)

Dose.—15 to 30 grains (1 to 2 Gm.).

Has equal solvent action on uric acid with piperazine, little action on human organism. Causes increase of diuresis, and reduces Sp. Gr. of urine.—P.J. 1894,621.

Lycetol a valuable help in the treatment of gout and rheumatism.—L. ii./97,39; i./99,136.

Lysidine.

Dose.—10 to 30 minims (0·6 to 1·8 Cc.).

A 50% solution of **Ethylene-Ethenyldiamine**: or METHYLGLYOXALIDIN,

$$\begin{array}{l} CH_2.NH \diagdown \\ \quad | \qquad\qquad\quad C.CH_3 = 83{\cdot}52 \\ CH_2.N \diagup\!\!\diagup \end{array}$$

(84·144 I. Wts.) a mono-acidic base.

A colourless alkaline liquid, employed in acute gout and uric acid diathesis generally.

Lysidinæ Tartras Acidus, Lysidine Bi-tartrate.

$C_4H_8N_2.C_4H_6O_6$=232·44 (234·192 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In white granular crystalline powder, with a saline taste, non-deliquescent and readily soluble in water.

Sidonal, Piperazine Quinate. (Patented.)

$$HN<\begin{matrix}CH_2CH_2\\CH_2CH_2\end{matrix}>NH\left(C_6H_7\begin{cases}(OH)_4\\COOH\end{cases}\right)_2=466\cdot82$$

(470·352 I. Wts.)

Daily dose during pain 80 grains (5 Gm.), less in chronic cases. **Tablets** 7½ grains (0·5 Gm.).

In white crystalline granules, soluble 1 in 1 easily of water, and about 1 in 250 of alcohol 90%, used as a uric acid solvent in gout and allied affections.—P.J. i./00,54; ii./00,213,489; B.M.J. i./01,1408.

Effervescent Piperazine Quinate.

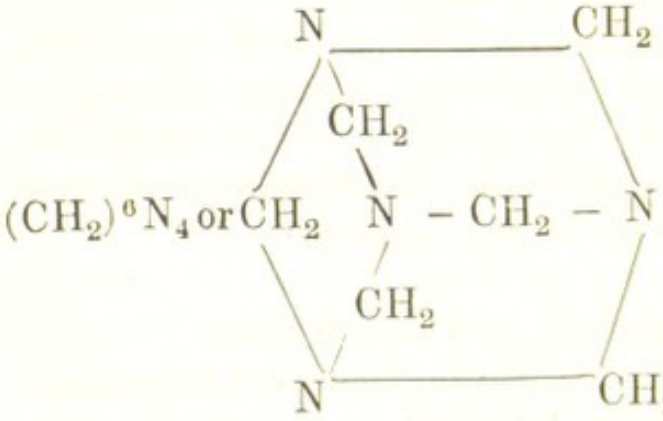
Dose.—1 drachm or more. Contains 5%.

Sidonal, New. *Dose.*—30 grains (2·0 Gm.).

This is said to be the anhydride of Quinic Acid; it is a white crystalline powder soluble about 1 in 2 of water, and about 1 in 11 of alcohol 90%, and is specially used for gout.—P.J. ii./02.273.

Tablets contain 7½ grains.

Hexamethylenetetramine.—*Syns.* **Hexamethylenamina, U.S. Urotropine, Aminoform, Formin, Cystamin, Cystogen, Metramine, Uritone, Vesalvine.**



$(CH_2)^6N_4$ = 139·22 (139·18 U.S. Wts.; 140·256 I.Wts.)

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In colourless crystals subliming, without melting, at 263°C. and partially decomposes, prepared by combining Ammonia and Formaldehyde. ***Soluble*** 1 in 1 of water nearly, with alkaline reaction, in Alcohol 90% 1 in 8, almost insoluble in Ether. A valuable diuretic

and solvent of Uric Acid concretions; it relieves cystitis associated with putrefaction and destroys typhoid bacilli in the urine —L. i./01,174; B.M.J. ii./01,394; B.M.J.E. ii./03,63.

Hexamethylentetramine should give no brown-red colour or precipitate with Nessler's Solution—indicating absence of Ammonia Salts.—C.D. i. '05,864.

Our examination of all the above commercial varieties gave results indicating absence of such impurities.

May cause irritation of the stomach, diarrhœa, measles-like rash, albuminuria and strangury, also hæmaturia, unless well diluted.—B.M.J. i./01,1472, 1617; L. i./05,83. Relieved the pyuria of tabes dorsalis.—L. ii./03,1019. Preservative properties.—P.J. i./03,777. General paralysis of the insane relieved.—B.M.J. i./05,185. Cholelithiasis relieved by, with iridin.—B.M.J. i./06,264.

Tablets, 3, 5 and 7½ grains, and Urotropine Effervescent Tablets 4 grains. Vesalvine Tablets 5 grains.

Vesalvine Effervescent, 5 grains in 1 drachm.

Cystogen is also supplied in effervescent form.

Uriform. *Dose.*—1 to 2 drachms.

Hexamethylenetetramine, with Saw Palmetto and Santal.

Helmitol. *Dose.*—15 grains (1·0 Gm.).

A white powder, soluble about 1 in 7 of water and slightly soluble in alcohol 90%. This is said to be the anhydro-methylene citrate of hexamethylenetetramine; given internally it is believed to liberate formaldehyde in the bladder, and so to have a disinfectant action; alkalis favour this decomposition. Valuable for cystitis, urethritis, and gonorrhœa.—B.M.J.E. ii./03, 79; ii./04,51; L. ii./04,1293. Also for the strangury of prostatic enlargement.—W.W.W.

To prevent renal complications of scarlatina.—B.M.J.E.i./06,68. **Tablets** contain 7½ grains (**0·5 Gm**).

Hetraline.—*Syn.* DIOXYBENZOL-HEXAMETHYLENE-TETRAMINE. $C_6H_{12}N_4C_6H_6O_2$=248·44 (250·304 I. Wts). *Dose.*—7½ to 30 grains (**0·5 to 2 Gm.**).

In crystalline needles containing about 60% of hexamethylenetetramine. ***Soluble*** 1 in 10 of water, and about 1 in 20 of alcohol 90%. Is employed in urethral diseases and cystitis; it is a good urinary disinfectant.—L. i./06,985.

Tablets weigh 7½ grains.—P.J. ii./03,764.

Chinotropine, Urotropine Quinate, Quinotropine. *Dose.*—Up to 90 grains (6 Gm.) daily.

A combination of Quinic Acid and Urotropine in white powder ***soluble*** in water 1 in 1 and in alcohol 1 in 20. Used as uric acid solvent. Considered to liberate formaldehyde internally, and to form soluble compounds with uric acid.

PIPERINA. U.S.

$CH_2O_2.C_6H_3.CH:CH.CH:CH.CON.C_5H_{10}$=
283·05 (285·192 I. Wts.) (283.04 U.S. Wts.).

Dose.—1 to 10 grains (0·065 to 0·65 Gm.).

A crystalline principle obtained from black and long pepper, the fruits of *Piper nigrum* (*Off.* and U.S.) and *Piper longum* (*Piperaceæ*), in large colourless prisms, which turn yellow with keeping. Melts at 130° C. (266° F.) U.S. Insoluble in water, soluble in alcohol, and less soluble in ether. At first tasteless, but on prolonged contact it develops biting taste; its spirituous solution has a peppery taste. The pungency of pepper is not due to Piperin. It has been used in conjunction with eucalyptol for neuroses and congestion of the spleen.

It has febrifuge and antiperiodic action. Physiological action similar to Conine but not so toxic.—Dixon.

Piperidine.

$$CH_2<\begin{matrix}CH_2.CH_2\\CH_2.CH_2\end{matrix}>NH = 84·49\ (85·128\ \text{I.Wts.}).$$

Is manufactured by reducing Pyridin in alcoholic solution with Sodium Amalgam (yield 75% of theoretical) or may be made from Piperine by distillation with Soda, Lime, or by boiling with Alcoholic Potash.

It appears to occur in pericarp of the peppercorns as such.

Piperidinæ Tartras. *Syn.* PIPERIDINE ACID TARTRATE.

$$CH_2CH_2CH_2CH_2NHCH_2\begin{Bmatrix}CHOH.COOH\\CHOH.COOH\end{Bmatrix} =$$
233·41 (235·176 I. Wts.).

Dose.—15 grains (1 Gm.) three times a day. Colourless pleasant-tasting crystals, readily soluble in water.

A powerful solvent of uric acid.—L. ii./98, 198; P.J. ii./99,176.

Effervescent Piperidine Tartrate.

Dose.—1 drachm or more; 5 grains in 1 drachm.

Piperidin-para-Sulphamine Benzoate.

$SO_2NH_2C_6H_4COOH,C_5H_{11}N = 284.14$ (286·284 I.Wts.)

Under the name of CALCUSOL, a combination of this salt with potassium bicarbonate is supplied in effervescent form, 5 grains in 60 grains, and is recommended in the treatment of the uric acid diathesis and renal calculus. **Tablets** of this combined salt and potassium bicarbonate are supplied; also **Tablets** 5 grains of the piperidine salt alone.

Oleoresina Piperis, U.S.

Average dose.—½ grain (0·03 Gm.). Is prepared by acetone extraction of pepper.

PISCIDIA.

Jamaica Dogwood.

The bark of the root of this tree, *Piscidia erythrina*, is employed in the West Indies to intoxicate fish. In America it is employed to relieve toothache, and as a general sedative; it is said to be specially useful in allaying the cough of bronchitis and phthisis; does not interfere with expectoration, or lower the vital force. It is said to be an effective remedy for dysmenorrhœa, to allay pain, spasm, asthma, and nervous excitement, and to produce sleep. It dilates the pupil.

Extractum Piscidiæ. An alcoholic extract.

Dose.—2 to 5 grains (0·13 to 0·32 Gm.).

Extractum Piscidiæ Liquidum.

Dose.—20 minims to 2 drachms (1·2 to 7 Cc.).

One drachm equals 1 drachm of the bark. Is a good narcotic, does not cause headache or constipation.

PIX LIQUIDA.

Tar (*Off.*). U.S. Known in commerce as Stockholm Tar, obtained by the destructive distillation of the wood of *Pinus sylvestris* and other species (*Coniferæ*).

Dose.—2 to 10 grains (0·13 to 0·65 Gm.) in a pill with lycopodium, or in perles.

As a diuretic and in bronchial catarrh and winter cough, it is very useful, and has been given for gastro-intestinal catarrh. Soluble about 1 in 1 of alcohol 90%.

On account of their antiseptic properties, both Wood

and Coal Tar and preparations of them have been used for surgical dressings. The former yields Creosote, *q.v.*

Tenax, a fine oakum is sold in 1-lb. packets.

Aqua Picis. Tar Water.—*Syn.* AQUA PICEA; EAU DE GOUDRON (Codex 1884).

Tar 1, Pine Sawdust 3. Mix and add Distilled Water 200. Macerate, with frequent shaking, for 24 hours and filter. *Dose.*—5 to 10 ounces (140 to 280 Cc.).

Emplastrum Picis. (*Off.*)

Contains half its weight of *Burgundy pitch* (*Off.*), the resinous exudation from the stem of *Picea excelsa* (*Coniferæ*) melted and strained.

Oleum Picis Rectificatum, Light Oil of Tar.

Two distilled oils of Wood Tar are met with in commerce, one light, known also as Rectified Spirit of Tar, having Sp. Gr. 0·853 to 0·867, is colourless when fresh, but becomes sherry-coloured with age; this is a powerful deodoriser, and is used for making Coster's paste, *q.v.* The other is an opaque black dense oil.

Perles of Tar.

Dose.—1 or 2. The Tar is enclosed in small globular capsules, containing about 2½ grains in each.

Pilula Picis Liquidæ.

Dose.—3 to 6 grains (0·2 to 0·4 Gm.).

Tar 1, Soap 1, Compound Tragacanth Powder ¼, Licorice Powder 2¾. Useful for winter cough.

Syrupus Picis Liquidæ, Syrup of Tar, U.S., 1890, B.P.C. *Dose.*—1 to 2 drachms (3·5 to 7 Cc.).

Tar 75 (previously mixed with white sand 100 and washed with cold water 150, during 12 hours), stir with Boiling Water 400 for 15 minutes, add Glycerin 100, and after 24 hours filter, dissolve Sugar 800 in filtrate with gentle heat, cool, strain, and add Water to 1,000.

U.S. 1900 orders:—Tar 5, wash as before; treat residue with the Alcohol 50, add Magnesium Carbonate 10, and Sugar 50, triturate and add Water 400; stir 2 hours and filter. Dissolve Sugar 800 in the filtrate by gentle heat and make up to 1,000 with Water.

Taste may be covered by addition of an equal quantity of syrup of wild cherry (*v.p.* 586); $\frac{1}{33}$ to $\frac{1}{10}$ grain of apomorphine hydrochloride may also be added to each dose. Useful in chronic bronchitis and winter cough.

Syrupus Picis cum Codeina. Ph. Helv.

Contains Codeine 1, with Proof Spirit *q.s.* in 1,000 of Syrup of Tar. *Dose.*—½ to 2 drachms (1·8 to 7 Cc.).

Unguentum Picis Liquidæ. Tar Ointment (*Off.*).
Tar 5, Yellow Beeswax 2. Useful in psoriasis.
Warm the tar to about the melting point of the wax, mix and stir.
U.S. has Tar 50, Yellow Wax 15, Lard 35.
For use in skin diseases we have the following liquid tars (also known as empyreumatic or pyroligneous oils): —

Oleum Betulæ Pyroligneum*. Birch Tar.

Oleum Cadinum. Oil of Cade. (*Off.*) **U.S.**—*Syn.* **Juniper Tar Oil. Oleum Juniperi Pyroligneum. Huile de Cade.** From *Juniperus Oxycedrus* and some other species (*Coniferæ* or *Pinaceæ*). Commercially, is said now to be made by distilling Oils of Turpentine and Juniper with chips and twigs of Juniper.
A preparation of this Oil with Stavesacre, *Pinus sylvestris*, and Clove Oil, made without animal fat, recommended in eczema.—M.A., 1906, 198.

Oleum Fagi Pyroligneum, Beech Tar. Oleum Fagi empyreumaticum depuratum, Ph. Ned.
On the Continent used as a source of creosote.

Linimentum Picis (Lassar).
Beech Tar 4, Birch Tar 3, Olive Oil 1, Alcohol (70%) 1.

Oleum Rusci Pyroligneum. Said to be obtained from **Butcher's Broom.** Is really a Birch Tar, identical with *Oleum Betulæ Pyroligneum.*

Oleum Betulæ Empyreumaticum, P. Austr. and Ph. Ned. A yellowish-brown oil from *Betula Alba* (L.) by distillation.
These Oils are less disagreeable in odour, and are deemed more efficacious than common Tar. The odour of Russia leather is due to Birch Tar. They are all soluble in oils, fats, wax, unctuous petroleum, and chloroform, but do not perfectly blend with alcohol.

Unguentum Olei Cadini. *Adopted by G.H.*
Melt Yellow Beeswax 1, add Huile de Cade 1, and stir till cold. Used in psoriasis and dry eczema. Similar ointments may be made of the other Tars, the proportions may be varied and lard may be used as a diluent if a weak ointment be required.

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* **Oleum Betulæ, U.S.**, is obtained by maceration and distillation from *Betula Lenta* (*Betulaceæ*). Essentially equivalent to Oleum Gaultheriæ, [*q.v.*]

Chronic eczema may be cured by an ointment of O of Cade 1, Vaseline 4.

An ointment of Glycerin of Starch 100, Oil of Cad 100, Green Soap 5, has cured psoriasis.

Oil of Cade in baths for psoriasis.—B.M.J. i./02, 1

Unguentum Rusci Compositum. — Oleu Rusci 30, Calamine 45, Unguentum Resinæ 12 Unguentum Zinci 120, Carmin Trituration Liquid Paraffin 15.

Is suitable for chilblains, eczema, prurigo, a psoriasis, and for irritation due to piles.

Resinol Ointment and Soap. Proprietary pr parations for skin eruptions and inflammations.

PLUMBUM.

Pb=205·35 (206·9 I. Wts.).

Plumbi Acetas, (*Off.*) **U.S.** *Syn.* SUGAR OF LEA **Saccharum Saturni, Ph. Ned.**

$Pb.(CH_3COO)_2, 3H_2O$=376·15 (378·996 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Colourless crystals or masses (U.S. requires 99·5% pure) soluble in water 1 in less than 3; in Alcoh (90%) 1 in 30, in Glycerin 1 in 2.

See also **Glycerinum Plumbi Subacetatis a** Liquor Plumbi Subacetatis Fortis atque Dilutus (*p.* 368

Incompatible with Carbonates, Soluble Chloride Sulphates, Tannates, Potassium Iodide and Opiu preparations. The *Subacetate* is incompatible wit Acacia Mucilage.

Uses.—Astringent, *e.g.*, in severe diarrhœa, and a a hæmostatic in gastric ulcer; is a powerful poison. E ternally as lotion for eczema, leucorrhœa, gleet, pruritu and for bruises.

Antidotes.—Emetics or Stomach Tube, Ma nesium or Sodium Sulphate followed by Stimulants.

Injectio Plumbi, R.F.H. Solution of Lead Su acetate 20 minims, Water to 1 ounce. In venereal disease

Lotio Plumbi Spirituosus. Lead Subacetat Solution 1, Glycerin 2, Alcohol (90%) 4, Rose Wat to 32. Has given immediate relief in piles in many case

Plumbic Chromate, $PbCrO_4$ = 320·6 (323·0 I. Wts 'Chrome Yellow.' Employed to colour the 3d. postage stamp ½ grain is a fatal dose.—L.i./06,1551.

Plumbi Nitras, U.S.

$Pb(NO_3)_2$=(328·49 U.S. Wts.), (328·51 B.P. Wts.), (330·98 I. Wts.).

Colourless or opaque crystals. Soluble in water about 1 in 2.

Plumbi Carbonas (*Off.*) CERUSSA, **Ph. Ned.** $2PbCO_3,Pb(OH)_2$ = 768·91 (774·716 I.Wts.).

Heavy white insoluble powder, soluble in dilute Acetic and Nitric Acids.

Interesting electrolysis of lead water pipes, owing to leak of 1·8 volts in earthed returns of electric cable, resulting in deposit of lead carbonate inside the pipes, and a contamination of the water to the extent of 0·14 grains of lead per gallon.—B.M.J. i./06,139.

Suspected lead poisoning and post mortem evidence.—B.M.J. i./05,1372.

Industrial lead poisoning amongst yarn workers.—B.M.J. i./06,310.

Unguentum Plumbi Carbonatis (*Off.*).

1 in 10 Paraffin Ointment, as a local sedative on bruised surfaces, burns and skin affections.

Plumbi Iodidum (*Off.*) PbI_2 = 457·15 (460·84 I. Wts).

Yellow crystalline powder. Used locally to reduce swellings. Only very slightly soluble in water.

Emplastrum Plumbi Iodidi (*Off.*). Lead Iodide 1, Lead Plaster 8, Resin 1.

Unguentum Plumbi Iodidi (*Off.*). 1 in 10 Paraffin Ointment. In some forms of skin disease.

Plumbi Oxidum (*Off.*). *Syn.*—LITHARGE. PbO= 221·23 (222·9 I. Wts.).

Yellowish-red powder (Massicot) or scales. Used to prepare **Emplastrum Plumbi** (*Off.*), *v.p.* 507.

Minium, P. Belg., *Red Lead*, Pb_3O_4 = 679·57 (684.7 I.Wts.). Made by heating Massicot.

PODOPHYLLIN.

Syn. PODOPHYLLI RESINA (*Off.*). U.S.

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.) as a cholagogue and aperient. (Laxative $\frac{1}{10}$ grain; purgative ½ grain, U.S.)

Since it attacks the intestinal epithelium it acts well in removing ankylostoma and other intestinal worms.—B.M.J.E. i./04,48.

The resin from the dried rhizome of *Podophyllum peltatum—Berberidaceæ* (*Off.*, U.S.)—American Mandrake, or May apple, sometimes called Vegetable Mercury, as it is a powerful biliary purgative. It is a pale greenish-brown amorphous powder, with an herby odour and acrid taste, soluble in aqueous ammonia, almost entirely soluble in 90% alcohol, leaving not more than 10% insoluble impurity. Ash should not exceed 2%.

U.S. requires Podophyllin to be 99% soluble in alcohol, not less than 75% in ether, not less than 65% in chloroform, not more than 25% soluble in water.

Fluidextractum Podophylli, U.S. 1=1, Hydr. alcoholic. *Average dose.*—8 minims.

Powdered Extract of Podophyllum of commerce contains 21% resin.

Podophylli Indici Rhizoma and **Podophylli Indici Resina, I.C. Add.**, *v.p.*xxviii. From *P. Emodi*. This resin is richer in Podophyllotoxin than that from *P. peltatum*.

Podophyllotoxin.

$$C_{20}H_{15}O_6(O.CH_3)_3 + 2H_2O =$$
476·61 (480·224 I. Wts.).

Is the principal constituent of Podophyllin. It is more certain in its action than Podophyllin and is given in dose of $\frac{1}{10}$ to $\frac{1}{8}$ grain, to children $\frac{1}{80}$ to $\frac{1}{30}$ grain. It is best administered by dissolving 1 grain in 2 drachms of 90% alcohol. *Dose.*—8 to 20 drops in a teaspoonful of syrup.

Pilula Podophyllin contains $\frac{1}{4}$ or $\frac{1}{2}$ grain of the resin in each, well triturated with milk sugar, acacia and syrup *q.s.*, to one pill.

Tablets $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ grain (0·008, 0·016 and 0·032 Gm.).

Pilula Podophyllin Composita.

Podophyllin $\frac{1}{4}$ grain, Barbados Aloes 1 grain, Capsicum $\frac{1}{2}$ grain, Green Extract of Belladonna $\frac{1}{4}$ grain, Excipient *q.s.* for one pill. One or two form a biliary aperient dose. St.Th.H. has Podophyllin $\frac{1}{4}$ grain, Calomel 1 grain and Alcoholic Extract of Belladonna $\frac{1}{6}$ grain.

Pilula Podophyllin et Quininæ.

Quinine Sulphate 1 grain, Podophyllin $\frac{1}{12}$ grain, Milk Sugar $\frac{1}{12}$ grain, Green Extract of Belladonna $\frac{1}{6}$ grain.

Extract of Socotrine Aloes 1 grain. To make one pill, or, if the quantities be taken in grammes, 15 pills. They are useful 'dinner pills,' and must be taken *with* food.

Dinner Tablets.

These are similar to the above pills, and are recommended not coated for prompt action.

Pilulæ Podophylli, Belladonnæ et Capsici, U.S.—100 pills contain Podophyllum Resin 1·6 Gm.; Extract of Belladonna leaves 0·8 Gm., Capsicum 3·2 Gm., Sugar of Milk 6·5 Gm., Acacia 1·6 Gm., Glycerin and Syrup *q.s.*

Tinctura Podophylli (*Off.*).

Twice the strength of that of B.P. 1885.

Podophyllin 1, Alcohol (90%) 30. Dissolve and filter.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

In dose of 2 to 4 drops in tea or coffee, taken night and morning, is useful in sick-headache and biliousness, where the bowels and liver are sluggish in worried and overworked patients, and in chronic diarrhœa with cutting pains and high-coloured motions. Also relieves constipation with clay-coloured motions following diarrhœa of infants, 1 or 2 drops on sugar twice or three times a day.—R. Its taste is acrid and disagreeable.

Tinctura Podophyllin Ammoniata.

Podophyllin 1, Aromatic Spirit of Ammonia 50 Dissolve, and after standing, decant.

Dose.—10 to 20 minims (0·6 to 1·2 Cc.) as a purgative and cholagogue, taken in a wineglassful of water or milk. Good Podophyllin dissolves almost entirely in spirit of sal volatile. This tincture has an advantage over the other tinctures of Podophyllin of forming a solution from which, on addition to water, the resin does not separate. The sal volatile also acts as a corrective.

Chologen Tablets are said to contain mercury and podophyllin, and are recommended to dissolve gall stones and check cholelithiasis.

POTASSIUM.

K = 39·15 (38·83 I. Wts.).

Potash Salts administered *per os* are non-toxic as they are excreted faster than they are absorbed.—Dixon.

Potassa cum Calce, P.L., consists of equal parts, in powder, of caustic potash and quicklime; it is also sold moulded into pencils. For **Vienna Paste,** *v.p.* 660.

Potassa Sulphurata (*Off.*). Liver of Sulphur. Deliquescent yellowish brown masses, smelling of sulphuretted hydrogen. Used in skin affections. Balneum, 2 ounces to 15 gallons.

Unguentum Potassæ Sulphuratæ. Liver of Sulphur 1, Sodium Carbonate 1, Lard 8. For Ringworm.

Potassii Acetas (*Off.*), **U.S.** $CH_3COOK = 97{\cdot}41$ (97·44 U.S. Wts.), (98·174 I. Wts.).

Dose.—10 to 60 grains (0·65 to 4·0 Gm.).

Deliquescent white crystals, masses or powder. Antilithic, diuretic and Uric Acid solvent. Soluble in Water 2 in 1, in Alcohol (90%) 1 in 2.

Mistura Diuretica, St. M.'s H.

Potassium Acetate 20 grains, Spirit of Nitrous Ether ½ drachm, Spirit of Juniper ½ drachm, Tincture of Ginger 10 minims, Water to 1 ounce.

St. J. H. has Potassium Acid Tartrate ½ drachm, Vinegar of Squill ½ drachm, Spirit of Nitrous Ether 5 minims, Digitalis Tincture 5 minims, Decoction of Broom ½ ounce.

N. H. W. has Potassium Acetate 20 grains, Solution of Ammonium Acetate 2 drachms, Vinegar of Squill 20 minims, Infusion of Broom 2 drachms, Water to ½ ounce.

Potassii Benzoas. $C_6H_5COOK.3H_2O = 212{\cdot}6$ (214·238 I. Wts.).

Dose.—15 to 20 grains (1 to 1·3 Gm.) White crystalline powder. Soluble in water 1 in 1½ and in alcohol (90%) 1 in 20. Uric Acid solvent.

Potassii Bicarbonas (*Off.*) **U.S.** $KHCO_3 =$ 99·38 (99·41 U.S. Wts.), (100·158 I. Wts.).

Dose.—5 to 30 grains.

White powder or crystals soluble 1 in water 4. Insoluble in Alcohol (90%). Antacid, diuretic, and has solvent action on Uric Acid concretions. It is most valuable in acute rheumatism.

Potassii Bichromas (*Off.*). Potassii Dichromas, U.S.

$K_2Cr_2O_7 = 292{\cdot}3$ (292·28 U.S. Wts.), (294·5 I. Wts.).

Dose.—$\frac{1}{10}$ to $\frac{1}{8}$ grain (0·0065 to 0·013 Gm.), in pill with Kaolin Ointment, for dyspepsia and gastric ulcer.—L. i./94,923; ii./95,671. Soluble 1 in 10 water. Capsules contain $\frac{1}{10}$, $\frac{1}{8}$ and $\frac{1}{4}$ grain.

Müller's Fluid.

Potassium Bichromate 2½, Sodium Sulphate 1, Water 100. Is used in histology for hardening tissues.

Potassii Bromidum (*Off.*).

K Br = 118·18 (119·11 I. Wts.).

Dose.—5 to 30 grains (0·32 to 2 Gm.).

Colourless or white crystals with saline taste. Soluble in water in 1 less than 2, and in about 200 of Alcohol 90%. Hypnotic and sedative, and is given as a drink cure. Often given with other bromides, *c.f.* Sal Bromatum, and with Chloral Hydrate, Arsenic or Belladonna.

Incompatible with Mineral Acids, Mercury and Silver Salts.

Tablets contain 5 and 10 grains.

To avoid the onset of Bromism give Fowler's Solution of Arsenic, and maintain the antisepsis of the bowels by purgatives, naphthol and salol.

Antidipso Powders, according to the *Lancet*, contain Potassium Bromide 1, Milk Sugar 3.

Mistura Dysmenorrhœica, N.H.W.

Potassium Bromide 15 grains, Tincture of Hyoscyamus ½ drachm, Sal Volatile ½ drachm, Spirit of Chloroform 10 minims, Water to ½ ounce.

Potassii Carbonas (*Off.*) **U.S.**

Syn. SALT OF TARTAR. K_2CO_3 = 137 21 (137·27 U.S.; 138·3 I. Wts.). *Dose.*—5 to 20 grains (0·32 to 1·3 Gm.).

White deliquescent powder. Soluble in water 4 in 3, insoluble in alcohol 90%. Employed chiefly as lotion externally, but internally has properties similar to those of the Bicarbonate.

Potassii Percarbonas. $K_2C_2O_6,H_2O$ = 214·64 (216·316 I. Wts.) White crystals, soluble in water, giving off oxygen. Used chiefly as 'antihypo' in photography, also for decolourising instead of Sulphuric Acid in 'Ziehl-Neelsen's' method of staining *Bacillus Tuberculosis*, *q.v.*

Potassii Chloras (*Off.*) **U.S.**

$KClO_3$=121·66 (121·68 U.S. Wts.), (122·6 I.Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

Manufactured by passing chlorine into water holding lime or magnesia in suspension, treating the clarified liquid with Potassium Chloride, and crystallising

the resulting chlorate from the liquor. Colourless crystals with saline taste. Soluble in water 1 in 16.

Incompatible with Oxidisable substances, Ferrous Salts, Sugar, Nitrites, Calomel, Hypophosphites, Honey, Vegetable Powders, Potassium Iodide.

Uses.—Is antiseptic and a powerful oxidising agent. Is useful in stomatitis and in sore mouth arising from Mercurial treatment. Must not be given when the kidneys are diseased.

Sixteen grains produced methæmoglobinæmia and death (special idiosyncrasy).—L. i/06.126.

Lozenges, Tablets, plain, and with Borax and Cocaine, are useful to allay irritation and improve the voice. Gargle, spray, mouth wash may be 2% strength. Chlorine Gargle is made from it, *q.v.*

Chloratifrice, a tooth paste, contains this Salt; as also does **Pebeco.**

Potassium Chloride. $KCl = 74{\cdot}02$ (74·60 I.Wts.)

Has been advocated for use in place of table salt by gouty and rheumatic individuals.

Potassii Citras (*Off.*).

$C_3H_4(OH).(COOK)_3, H_2O = 321{\cdot}99$ (324·506 I. Wts.).

Dose.—10 to 40 grains (**0·65 to 2·6 Gm.**).

A white powder obtained by neutralising citric acid with potassium carbonate. It is produced commercially by a special process as a neutral, non-deliquescent, crystalline powder. It has diaphoretic, diuretic, and febrifuge properties. Also for gout, and in enuresis where the urine is over-acid. U.S. requires 98·77% pure.

Liquor Potassii Citratis, U.S.

Potassium Bicarbonate 8, Citric Acid 6, water to 100.

'Vescettes' of Potassium Citrate, 15 grains.

To be crushed and taken in a draught of warm water.

Potassii Cobalto-Nitris.

Dose.—$\frac{1}{2}$ grain (0·032 Gm.).

Employed like the other nitrites as a vasodilator in angina, gastralgia, and epilepsy. Action more prolonged than that of potassium nitrite.

Potassii Cyanidum. $KCN = 64{\cdot}68$ (65·19 I.Wts.)

Official as a test, in fused masses. No dose is mentioned, but $\frac{1}{12}$ to $\frac{1}{4}$ grain (**0·0054 to 0·016 Gm.**), of the crystallised salt may be given; a solution of one

grain of the crystals in 23 minims ($20\frac{10}{13}$ grain-measures) of distilled water is equivalent in strength to Acidum Hydrocyanicum Dilutum (2%), in place of which it is sometimes used.

Dixon mentions that the isocyanides assumed to be based on the formula R—N≡C are more active than the Nitrites, of assumed composition R—C≡N

Syrupus Potassii Cyanidi cum Morphina.

Dose.—1 drachm, thrice daily.

Potassium Cyanide 4, Morphine Sulphate 2, Syrup of Virginian Prune to 3,000.

In bronchitis or phthisis with excessive cough.—H.

Potassii Ferrocyanidum, U.S.

$K_4Fe(CN)_6, 3H_2O = 419{\cdot}66$ (B.P. and U.S. Wts.), (422·788 I.Wts.). *Dose.*—7½ grains (0·5 Gm.).

Said to be physiologically almost without action.—P.J. ii./05,924.

Potassa Caustica, Potassii Hydroxidum, (*Off.*) U.S. KOH = 55·71 (56·158 I.Wts.).

Manufactured by interaction of Potassium Carbonate and Calcium Hydroxide. White deliquescent sticks or cakes. ***Soluble*** in water 2 in 1, and in twice its weight of 90% alcohol.

Incompatibles.—Acids, metallic salts, alkaloidal salts and preparations.

Antidotes.—Any dilute vegetable acid, fixed oils, stimulants; not stomach pump or lavage.

Given in mixtures as **Liquor Potassæ** (*Off.*) (5·85%), well diluted; also used as a caustic, and occasionally used as Potassa cum Calce., *q.v.*

Potassii Iodidum. (*Off.*). U.S. KI = 164·73 (166·12 I.Wts.). In white or colourless cubic crystals soluble in less than its own weight of water, and in 12 parts of Alcohol 90%. ***Incompatible*** in solutions with Spiritus Ætheris Nitrosi, Salts of Iron (except Ferri et Ammonii Citras and Liquor Ferri Acetatis), Salts of Bismuth, Lead and Mercury, with Liquor Strychninæ Hydrochloridi, with Quinine Sulphate and other alkaloidal salts, Silver Nitrate and Potassium Chlorate.

A slightly alkaline solution of Potassium Iodide keeps better than an acid one.

Uses.—In universal use in the later stages of syphilis, in arterio-sclerosis, and certain cases of gout and rheumatism.

Is specific for actinomycosis. One patient took 16,320 grains in five months—an average of 103 grains daily; another took an average of 40 grains per day for 14 months, and was cured.—L. ii./04,1204. Sodium Iodide not so depressing.—L. ii./04,1225.

Rheumatism responsible for ovarian pain treated by.—B.M.J. ii./04,1063.

Rheumatoid arthritis best treated by 10-grain doses thrice daily, with Guaiacol Carbonate.—Luff., Pr. July,05.

In exophthalmic goitre Potassium Iodide to be avoided—the rationale being that the thyroid secretion which contains iodine is being poured into the system in excessive quantities.—B.M.J. ii /05,1249.

For asthma is recommended to lessen the tendency to attacks.—M.A., 1906, 132.

Skin eruptions caused.—L. i./03, 644. In arteriosclerosis the pressure is lowered—B.M.J.i./06,319.

Arrests the rapidity of the progress of arterial atheroma, given with aromatic and artificial digestives, is often well borne in milk. Not in large doses.—M. Arch., 1905,388.

In dry forms of disease of the middle ear.—B.M.J. ii./04, 1206, 1209.

Secondary and tertiary syphilis of larynx and trachea successfully treated by Potassium Iodide and Mercurials internally and by inunction.—B.M.J. i./06, 62.

Acute parotitis favourably treated by painting the swelling with Iodine and administering Potassium Iodide internally.—B.M.J. i./06,81.

The frequent appearance in iodism of a pustular eruption suggested the possible explanation of its being due to some influence of the drug over the serum—*e.g.*, limitation of its power to produce those bodies which prepare the bacteria for phagocytosis, or a power of combining with or neutralising those bodies when formed. Conclusions drawn from cases. Iodide experiments were negative—the administration of Potassium Iodide has no influence on the opsonic index of the serum. An eruption is not necessarily associated with a low opsonic index. The addition of Potassium Iodide *in vitro* does not interfere with its opsonic power.—Brit. Jl. Dermatology, Aug., 1905.

Many samples contain trace of Iodate.—P.J.i./05,863.

Pilula Potassii Iodidi.—Contains 1 grain or more.

Potassium Iodide 1 grain, Sodium Carbonate Exsiccated $\frac{1}{8}$ grain, with Tragacanth and Syrup.

Tablets and **Capsules** contain 5 grains.

Linimentum Potassii Iodidi cum Sapone (*Off.*).

Mix Curd Soap recently prepared, in fine shreds, 2 ounces, with Water 10 ounces, and Glycerin 1 ounce in a porcelain dish on a water bath. When dissolved, pour the liquid on to Potassium Iodide $1\frac{1}{2}$ ounces in powder in a mortar. Triturate briskly until cold. Set aside 1 hour, and rub in Lemon Oil 1 drachm.

A soft **jelly-form Liniment of Potassium Iodide and Soap** may be produced with Soft Soap $\frac{1}{2}$, Potassium Iodide $1\frac{1}{2}$, Glycerin 1, water 10. The following is somewhat stiffer: Soft Soap 1, Potassium Iodide $1\frac{1}{2}$, Glycerin 1, Water 10.—P.J. ii./04,376.

Iodine, Water-Sterilising Tablets.

For destroying bacteria in water, for preparing antiseptic lotions, supplied in $1\frac{1}{2}$ pint, 2 gallon and 8 gallon sizes. Each size contains 25 each of three kinds of tablets, sufficient therefore to sterilize 25 times the quantities of water mentioned above. The 'A' Tablets contain 15% Potassium Iodide and 4% Potassium Iodate; the acidifying tablets 'B' consist of Citric Acid; the 'C' Tablets are composed of a mixture of Sodium Sulphite and Sodium Carbonate.

The germicidal value of iodine is high; 1 part per 100,000 is effective; the reaction of the 'A' and 'B' Tablets yields 5 parts per 100,000. The residual chemicals, 8 parts per 100,000 of Sodium and Potassium Citrates, $1\frac{1}{2}$ parts of Iodide and a trace of Iodate are insignificant in amount and harmless. Water infected with *B. typhosus* has been examined for efficiency. *Cf.* Antityphoid Tablets.

Potassii Nitras (*Off.*). U.S. KNO_3=100·41(101·19 I.Wts.; 100·43 U.S. Wts.). *Syn.* NITRE. *Dose.*—5 to 20 grains (0·32 to 1·3 Gm.).

Fumus Potassii Nitratis (Nitrated Papers); Charta Nitrata. P. Austr.

Are made by soaking white blotting-paper with 20% Nitre solution and drying. To relieve asthma these are burnt and the fumes inhaled.

Asthmatic Pastilles are prepared in cones containing a mixture of chlorate and nitrate of potassium.

Ozone Papers are similar in composition.

In addition to the above, various powders and cigarettes are sold of which Nitre is a constant and

Stramonium is generally an ingredient; Himrod's Cure, Bliss's Cure, and the Green Mountain Cure resemble—

Pulvis Lobeliæ Compositus.

Potassium Nitrate 240, Boiling Distilled Water 240. Dissolve and add to Lobelia (*v.p.* 741) in powder, Stramonium Leaves in powder, Black Tea in powder, 240 of each. Mix well, dry, and add Oil of Anise 1. The fumes of half a teaspoonful or more to be inhaled six or eight times a day, and the bedroom fumigated with same.

An asthma powder for burning is on the market containing Daturine, Sodium Nitrite, Lobelia, Grindelia and Nitre. (The physiological action of lobelia seems to resemble that of conium and nicotine.—Dixon.)

Folia Stramonii Nitrata, *Arzn.*

Stramonium Leaves 2, moistened with Potassium Nitrate 1 dissolved in Water 3, and dried.

Charta Antasthmatica, Ph Ned. Blotting paper soaked in Infusion of Belladonna, Digitalis, Salvia officinalis (Sage), Stramonium Leaves, and Nitre, dried and treated with Benzoin Tincture.

Ophthalmic discs contain $\frac{1}{300}$ grain (0·00013 Gm.) potassium nitrate combined with gelatin.

Schulze's Maceration Mixture.

A mixture of Potassium Chlorate 10 (moistened with water) with Nitric Acid 40; or a Solution of 0·06 Potassium Chlorate in Water 100 Cc. and 1 Cc. of Nitric Acid. For separation of muscle fibre in animal, and ligneous tissue in vegetable histology.

Effervescent Potassic Aperient.

Dose.—One drachm in half a tumbler of warm water.

A preparation containing **Potassium Sulphate** (*Off.* and U.S.), K_2SO_4 = 173·00 (174·36 I. Wts.), Magnesium Sulphate and Sodium Bicarbonate, with Citric and Tartaric Acids. Suggested as an alternative to Sodio-Magnesian Aperient (*q.v.*).

Effervescent Potassic Aperient with Potassium Sulphocarbolate.—*Dose* (as above).

1 drachm contains in addition to the above 10 grains of the Sulphocarbolate. Is useful where gastric and intestinal fetor are present.—Colin Campbell.

Potassii Nitris. KNO_3 = 84·53 (85·19 I. Wts.)

Dose.—¼ to 1½ grains (0·016 to 0·1 Gm.).

A crystalline deliquescent powder and in sticks. It

is a vaso-dilator, improves the cerebral circulation and is given for migraine, asthma and epilepsy.

Pulvis Potassii Nitritis Compositus.

Potassium Nitrite ½ grain, Potassium Nitrate 18 grains, and Potassium Bicarbonate 25 grains; mix and dispense in parchment paper. This dose may be given every morning in a tumbler of water to reduce blood pressure; is diuretic. Has thus checked recurrent epistaxis. Should be tried for gout.—L. ii./02,331.

Potassii Phosphas, Dipotassic Hydric Phosphate. K_2HPO_4=172·98 (174·308 I.Wts.)

A deliquescent granular powder; is given as an alterative in phthisis and urinary affections. *Dose.*—1 to 10 grains (0·065 to 0·65 Gm.).

Potassii Succinas.

$$C_2H_4\begin{cases}CO.OK\\CO.OK\end{cases}+3H_2O = 246·46\ (248·38\ \text{I. Wts.}).$$

A deliquescent powder; has been used in doses of 5 to 10 grains to control hæmorrhage. **Ferri Succinas,** Ferric Succinate, a reddish-brown insoluble powder, removes biliary calculi and relieves hepatic colic.

Sal Polychrestum. *Syn.* **Glaser's Salt.**

Dose.—30 to 120 grains.

A mixture of Potassium Sulphite and Sulphate, has a sulphurous odour, has been given for dyspepsia and for chronic skin diseases. — B.M.J. ii./03,499. **Sal Enixum** is potassium bisulphate. $KHSO_4$ = 135·17 (136·218 I. Wts.).

Potassii Tartras (*Off.*).—**Normal or Neutral Potassium Tartrate.** $(CHOH)_2COOK.COOK,\frac{1}{2}H_2O$.

Dose.—30 to 240 grains (2 to 16 Gm.).

Crystalline powder with bitter taste.

Manufactured by neutralising Acid Potassium Tartrate with Potassium Carbonate.

Soluble.—About 5 in 3 of water. Has purgative and diuretic properties.

Potassii Tartras Acidus. (*Off.*) **Potassii Bitartras, U.S.** *Syn.* PURIFIED CREAM OF TARTAR. $(CHOH)_2COOH.COOK$ = 186·75 (188·19 I. Wts.).

Dose.—20 to 60 grains (1·3 to 4·0 Gm.).

The crude tartar deposited during the fermentation of wine—recrystallised. A white powder with acid taste

soluble 1 in 200 of water. Has diuretic and cathartic action. Is employed in acute renal disease. Where the urine is thick and alkaline, this salt neutralises and produces normal appearance. This salt is used to prepare Haustus Imperialis K.C.H., **Imperial Drink**, which contains 1 in 160 of water, with Tartaric Acid 1, Sugar 16, and Lemon Oil 12 minims to the gallon.

B.P. requires 97·11 and U.S. requires 98·99% pure.

Potassii Boro-Tartras. SOLUBLE CREAM OF TARTAR. P.G. *Dose.*—20 to 40 grains (1·3 to 2·6 Gm.).

An amorphous white powder. Potassium Acid Tartrate 5, Borax 2. Dissolve with heat in water, *q.s.*, and evaporate to dryness.

Soluble to extent of 1 in 1 of water.

Use.—Similar to that of Cream of Tartar.

Potassii Telluras.

K_2TeO_4, $5H_2O$ = 359·98 (I. Wts.).

Dose.—$\frac{1}{3}$ grain (0·02 Gm.).

Greatly reduced night-sweats of phthisis; day-sweats required rather larger doses. Indigestion only followed doses of 1 grain daily.—L. ii./90, 365; i./92,657.

PRUNI VIRGINIANÆ CORTEX (*Off.*).

Syn.—WILD CHERRY BARK, U.S.

The bark of *Prunus serotina* (*Rosaceæ*) contains amygdaline; on distillation with water it yields an essential oil rich in hydrocyanic acid; on moistening the bark with water, the odour of the latter is developed (*vide* also *p.*122). It possesses bitter tonic properties, with more or less sedative ones. The preparations in use—the tincture and syrup—are used to palliate the cough in phthisis, pertussis and bronchitis, in palpitation of the heart, and debility, particularly of the digestive organs.

Syrupus Pruni Virginianæ (*Off.*).

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.).

Percolate Virginian Prune Bark, in No. 20 powder, 3 with Water to 9, dissolve Sugar 15 without heat. Add Glycerin 1·25, strain, and pour Water over strainer, *q.s.* to 20. **U.S.** has these quantities, excepting Sugar 14 and Glycerin 3.

Infusum Pruni Virginianæ, U.S. *Average dose.*— 2 ounces. 1 in 25 of cold water with glycerin 5% of the whole.

Tinctura Pruni Virginianæ (*Off.*).

Dose.—30 to 60 minims (1·8 to 3·5 Cc.).

Virginian Prune Bark, in powder, 8; Distilled Water 15. Macerate 24 hours in a closed vessel, and add alcohol (90%) 25. Macerate 7 days more, express and filter.

PTOMAINES.

Under this name are classed a number of basic substances which are produced in meat, fish, and albuminoid food undergoing putrefaction by decomposition or by bacterial metabolism. In their chemical and physiological properties they are akin to the alkaloids, several being dangerous poisons. Hence the occasional outbreaks of ptomaine poisoning from the consumption of meat pies, fish, and the like.

Symptoms are those of gastro-intestinal irritants but they may resemble those of Atropine poisoning. Dryness of the tongue, thirst, dilated pupils, debility, with probably rigors, diarrhœa with offensive stools, high temperature, sickness with convulsions.

Tyrotoxicon occurs in stale cream, cheese, milk products; causes vomiting, purging, rapid pulse, dyspnœa, depressed temperature and prostration.

Antidotes.—Give emetics and Castor Oil, then stimulants. Amyl Nitrite, Strychnine Digitalis, Caffeine, Sal Volatile, Tannic Acid, and Atropine hypodermically.

For **Fish Poisoning** give Potassium Chlorate or Liquor Ammoniæ Acetatis; also Tinctura Capsici, and Spiritus Chloroformi.

Presumed Ptomaine poisoning from tinned fish.—L. ii./03,755,848.

Poisoning by bad bacon treated with Calomel, and later injections of Atropine and Strychnine.—B.M.J. ./06,258.

PULSATILLA.

Anemone pratensis, L., and *A. Pulsatilla, L.*, Pasque Flower, Meadow Anemone or Windflower.

Anemonin. Pulsatilla Camphor.

$C_{10}H_8O_4 = 190{\cdot}62$ (192·064 I. Wts.).

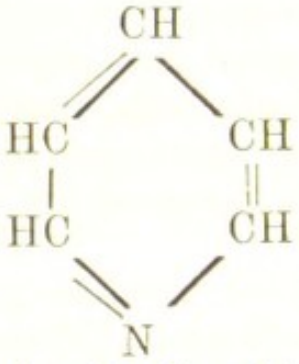
Dose.—$\frac{1}{60}$ to $\frac{1}{12}$ grain (0·001 to 0·0054 Gm.).

White crystals, sparingly soluble in water or ether,

more soluble in alcohol. ***Uses.***—Given for dysmenorrhœa and epididymitis. It irritates, then paralyzes, the respiratory centre, and diminishes cardiac activity and voluntary movements. Useful in bronchitis with convulsive cough, pertussis, asthma, and orchitis.

Tinctura Pulsatillæ, B.P.C. 1 in Alcohol (60%) 10. *Dose.*—1 to 5 minims (0·06 to 0·3 Cc.) or more; for amenorrhœa or dysmenorrhœa, a minim every hour or two hours, a day or two before periods.

PYRIDINA.



or C_5H_5N=78·49 (79·08 I. Wts.).

Dose.—5 to 10 minims (0·3 to 0·6 Cc.) daily, increased.

A colourless liquid with a persistent empyreumatic odour, miscible with water (with alkaline reaction), alcohol, ether, and oils; boils at 243° F.; obtained from bone-oil and many organic substances by dry distillation; is contained in and combined with nicotine in tobacco smoke. Sp. Gr. 0·980.

Uses.—It is probably the relieving agent of various cigarettes and powders smoked or burnt for asthma and whooping cough. A drachm of it is placed on a plate in a small room, in which the patient remains from 20 to 30 minutes three times a day. Is employed for making Denaturalised Alcohol in Germany.—*See* Alcohol.

It has been used as a heart stimulant; and is valuable in angina pectoris and cardiac failure.

QUEBRACHO CORTEX.

The bark of *Aspidosperma Quebracho*, imported from the Argentine Republic, in pieces about ¾ inch thick. It contains Aspidospermine and other alkaloids.

Uses.—An aromatic bitter, given in typhoid fever and to relieve dyspnœa and asthma and as a febrifuge.

Aspidospermine Sulphate $(C_{22}H_{30}N_2O_2)_2H_2SO_4$ =800·66 (806·716 I. Wts.) (Fraude), in dose of

$\frac{1}{64}$ to $\frac{1}{32}$ grain (0·001 to 0·002 Gm.) hypodermically may lower temperature in typhoid where quinine fails.

Tinctura Quebracho.

Dose.—$\frac{1}{2}$ to 1 drachm (1·8 to 3·5 Cc.) or more.

Is prepared 1 in 5 of alcohol 60%.

Extractum Quebracho Fluidum, P. Austr.

1 = 1 of bark. *Dose.*—5 to 10 minims (0·3 to 0·6 Cc.)

QUINETUM.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

The mixed alkaloids, in amorphous greyish white powder, obtained from red bark, *Cinchona succirubra*.

Quineti Sulphas, Quinetum Sulphate.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) or more.

Acicular crystals slightly soluble in water.

In ague acts as well as quinine.

QUINIDINÆ SULPHAS.

$(C_{20}H_{24}N_2O_2)_2,H_2SO_4 + 2H_2O = 776{\cdot}78$ (782·652 I. Wts.). *Dose.*—1 to 20 grains (0·065 to 1·3 Gm.).

Obtained from cinchona, principally from Pitayo and Cuprea barks. White crystals, ***soluble*** 1 in 100 of water, more soluble with acid. Its solution produces an emerald-green colour with chlorine water and ammonia. So does quinine, which, however, is easily soluble in ether, and quinidine forms an hydriodide only slightly soluble in water and alcohol. Quinidine salts are powerful antiperiodics, equal to those of quinine, to which they stand next in market value. Quinidine Sulphate is suitable for administration to children, being less bitter than the other cinchona alkaloids.

QUININA.

$C_{19}H_{20}N_2 \begin{cases} O.CH_3 \\ OH \end{cases} + 3H_2O$ or $C_{20}H_{24}N_2O_2,3H_2O$ =375·48 (378·320 I. Wts.). **Ph. Ned.** is anhydrous.

Dose.—1 to 4 grains (0·065 to 0·26 Gm.) or more (if anhydrous, 3 parts equal approximately 4 of sulphate).

This, the most valued cinchona alkaloid, is a very bitter, white amorphous powder.

Soluble.—Very slightly in water, 1 in 40 of ether

and about 1 in 1 of alcohol 90%, also in dilute acids, 1 in 3 of chloroform, and in aqueous ammonia. Its solution in diluted sulphuric acid is fluorescent, lævogyrate, and gives, with solution of chlorine and ammonia afterwards added, a green colour due to **Thalleioquin.**

Acidum Quinicum. *Syn.* KINIC ACID.

$C_6H_7\begin{cases}(OH)_4\\COOH\end{cases} + H_2O = 208{\cdot}53$ (210·112 I. Wts.).

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

An acid contained in Cinchona, principally combined with the alkaloids and with calcium, is met with in white crystalline masses, soluble in water about 5 in 6, and in alcohol 90% 1 in 35. It is decomposed into hippuric acid in the system. In gout and rheumatism. —B.M.J. i./01,940; B.M.J.E. i./01,56; ii./02,31.

Urosin Tablets, 8 grains, are a Quinic Acid and Lithium compound; one several times a day; are used to check gout.—P.J. i./99,446.

A dose of 50 Gm. has been taken, and persons suffering from arterio-sclerosis and valvular disorders have consumed it without untoward effects.—M.P. ii./05,5.

Urol. *Syn.* **Urea Quinate.**

$2CO(NH_2)_2.C_7H_{12}O_6 = 309{\cdot}99$ (312·32 I. Wts.).

Dose.—4 to 8 grains. A crystalline salt. Readily soluble in water. Has been suggested for gout.

Quininæ Arsenas. $2(C_{20}H_{24}N_2O_2),H_3AsO_4 + 8H_2O = 927{\cdot}74$ (934·696 I. Wts.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain (0·008 to 0·032 Gm.) in a pill.

Is in small white acicular crystals, sparingly soluble in cold water. It is an antiperiodic, given in chronic malarial fevers. Contains about 30% of arsenic acid, and 69·4% of quinine.

Quininæ Camphoras.

$2(C_{20}H_{21}N_2O_2).C_8H_{14}(COOH)_2 = 842{\cdot}30$ (848·672 I. Wts.). *Dose.*—1 to 10 grains. Occurs as a white powder, insoluble in water. Contains 76·4% quinine.

Quininæ Carbolas.

Dose.—1 to 5 grains (0·065 to 0·032 Gm.).

A powder containing nearly 75% quinine.

Quininæ Chloras.

$C_{20}H_{24}N_2O_2,HClO_3 + 2H_2O = 441{\cdot}43$ (444·762 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) in pill.

In slender white needles, very slightly soluble in water. Contains 72·9% quinine.

Quininæ Citras.

$2(C_{20}H_{24}N_2O_2).C_3H_4.OH(COOH)_3 + 7H_2O = 959·46$ (966·720 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·032 Gm.) in pill with glycerin of tragacanth, or slightly powdered and suspended in water, in which this salt is sparingly soluble—1 in 900—has, therefore, little taste. It is in crystals like the sulphate. Contains 67·1% Quinine.

Effervescent Quinine Citrate. *Dose.*—1 drachm. Contains 1 grain in 1 drachm.

Ferri et Quininæ Citras (*Off.*). **Ferri et Quininæ Citras Solubilis, U S.**

Dose.—5 to 10 grains (0·32 to 0·65 Gm.) in solution, or in pills with simple syrup or mucilage of acacia (not in excess, as, unless made very hard, they lose shape). Alcohol 60% with Glycerin 5% is also a suitable excipient. Contains about 15% of quinine (U.S. 11·5%), is in greenish golden scales, slightly deliquescent and very soluble in water. It has an agreeable bitter, chalybeate taste, and is largely employed as a general tonic

U.S. has further, **Ferri et Quininæ Citras,** of reddish brown colour, slowly soluble in water.

Incompatible with Tannin and Alkalis, also with Phosphoric Acid (Ferric Phosphate may be thrown out), unless considerably diluted prior to mixing.

Effervescent Citrate of Iron and Quinine.

Dose.—1 drachm (4 Gm.)=3 grains of the salt.

Tablets of Iron and Quinine Citrate, 3 grains.

Syrupus Ferri et Quininæ Citratis.

Dose.—1 drachm (3·5 Cc.). 1 in 20 Orange Syrup.

Ferri, Quininæ et Strychninæ Citras (*v.p.*679) contains 1% of strychnine.

Quininæ Formas ("**Neutral**").

$C_{20}H_{24}N_2O_2.(H.COOH)_2 = 413·18$ (416·304 I. Wts.).

Suggested dose.—1 to 3 grains.

Long white needles containing approximately 77·9% Quinine, melting at 95° C.

Quininæ Formas ("**Basic**").

$C_{20}H_{24}N_2O_2\ HCOOH = 367·51$ (370·288 I. Wts.).

Prepared by using a very small quantity of water, in

which the Quinine is placed and the acid added. Crystals melting at 132° lævorotatory. *Suggested dose.*—1 to 3 grains. Contains 87·5% Quinine approximately. A general tonic. Is suitable for hypodermic use.—C.D.ii./05,404.

Guttæ 1 in 50 have been employed satisfactorily in asthenopia.

Quininæ Hydrobromidum, U.S. **Quinine Bromide,**

$C_{20}H_{24}N_2O_2\,HBr + H_2O = 420{\cdot}07$ (423·256 I. Wts.)

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) or more.

White acicular crystals, soluble 1 in water 40.

Contains 76·6% of Quinine. Quinine is given with an excess of hydrobromic acid to lessen the cinchonism sometimes caused by large doses. Is valuable in acute rheumatism.

In malaria for oral administration, or hypodermically or intravenously.—Pr. Lxxiii, 682.

Tablets contain 3 and 5 grains.

Tablets of Quinine Hydrobromide, 3 grains (0·2 Gm.), **with Phenacetin,** 5 grains (0·32 Gm.), are prepared.

Hypodermic Tablets of **Quinine Hydrobromide** contain ½ grain.

Quininæ Hydrobromidum Acidum.

$C_{20}H_{24}N_2O_2.2HBr + 3H_2O = 536{\cdot}18$ (540·266 I. Wts.)

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) hypodermically.

In yellowish rectangular prismatic crystals, or in powder. Contains 60% of Quinine. Soluble 1 in 7 of water, and is well adapted for hypodermic injection. It is entirely unirritating.

The hydrobromic radical tends to prevent quinism.

Sterules, Hypodermic, contain 2 grains each.

Injectio Quininæ Hydrobromidi Acidi Hypodermica. 1 grain in 6 minims.

Dose.—3 to 12 minims (0·18 to 0·7 Cc.). Used when quinine cannot be borne by the stomach; a much smaller dose of this will act than required by the mouth.

Very useful in malarial fever and subsequent rheumatism.—B.M.J. i./02,439.

Quininæ Hydrochloridum (*Off.*) **U.S.**

$C_{20}H_{24}N_2O_2.HCl + 2H_2O = 393{\cdot}79$ (396·762 I. Wts.)

Dose.—1 to 10 grains (**0·065 to 0·65 Gm.**).

In acicular white crystals.

Soluble 1 in 40 of water, 1 in 3 of 90% alcohol.

Quinine Hydrochloride 2 with Antipyrin 1 will dissolve in 4 of water.

Contains 81·8% base against 73½% in the sulphate.

Emulsion, 1 in 60 with cod liver oil, is recommended for dressing burns, chronic ulcers and intertrigo.—L. i./02,443.

Sometimes better tolerated than the Sulphate.—P. lxxiii., 682.

Injectio Quininæ Hydrochloridi, U.C.H. Ear injection, 4 grains to 1 ounce.

Pessus Quininæ.—3 to 5 grains of Quinine Hydrochloride. A valuable remedy for leucorrhœa.—L.i./99,26.

Tablets, 1, 2, 3, 4, and 5 grains.

Tinctura Quininæ (*Off.*).

Dose.—½ to 1 drachm (**1·8 to 3·5 Cc.**).

Quinine Hydrochloride 1, Tincture of Fresh Orange 50. A very agreeable form of taking small doses of Quinine. Hydrochloride of Quinine is used in place of Sulphate, as suggested by the late W. Martindale.

Vinum Quininæ (*Off.*).

Dose.—½ to 1 ounce (**15 to 30 Cc.**).

Contains one grain of Quinine Hydrochloride dissolved in one ounce of Orange Wine.

To estimate approximately add dilute Sulphuric Acid ½ drachm to Quinine Wine ½ ounce, then Mayer's Reagent (*v.p.* 391) 2 drachms or *q.s.* Collect, wash and dry the precipitate, which should weigh 1¼ grains.—P. J. ii./05,901.

Quininæ Hydrochloridum Acidum. (*Off.*)

$C_{20}H_{24}N_2O_2.2HCl = 394{\cdot}22$ (397·188 I. Wts.).

Dose.—1 to 10 grains (**0·065 to 0·65 Gm.**), ½ to 2 grains (**0·032 to 0·13 Gm.**) hypodermically.

In white or yellowish white crystalline crusts. Is claimed to be soluble 1 in 1 of water. Contains 81·6% of quinine. 1 grain in 6 minims is suitable for hypodermic injection. In cholera.—B.M.J.E. ii./92,55.

Sterules, Hypodermic, of Quinine Acid Hydrochloride contain 2 grains each.

Tablets 1, 3 and 5 grains.

Tablets, Hypodermic, contain 1, 2, 3 grains.

Garsed finds this salt practically anhydrous; does not contain the $3H_2O$ of the B.P.

Quininæ et Ferri Chloridum.

Dose.—1 to 3 grains (0·065 to 0·2 Gm.).

Is in the form of brown scales, soluble 5 in 4 of water, and 1 in 50 of alcohol 90%. The powder and concentrated solution are hæmostatic.

Quininæ Hydrochloro-Sulphas.

$(C_{20}H_{24}N_2O_2)_2.HCl.H_2SO_4 + 3H_2O = 830·85$ (837·126 I.Wts.). *Dose.*—1 to 10 grains (0·065 to 0·65 Gm.).

In masses of small needles, or reduced to powder, containing 77·4% of alkaloid, soluble 1 in about 2 of water, and about 1 in 7 Alcohol 90%.—L.ii./92,1142.

Injection in inoperable cancer of the uterus with good results.—B.M.J.E. i./03,26. In cancer of the breast improved general condition of the patient.—Bulletin Médicale, 1901, No. 15, *p.* 173.

Injectio Quininæ Hydrochloro-Sulphatis Hypodermica, 1 grain in 4 minims.

Dose.—2 to 12 minims (0·12 to 0·7 Cc.).

Quininæ Hydrochloro-Carbamidum.—*Syn.* Urea-Quinine.

$C_{20}H_{24}N_2.O_2.HCl + CO(NH_2)_2, HCl + 5H_2O =$ 543·29 (547·38 I. Wts.).

Dose.—5 to 15 grains (0·32 to 1 Gm.).

In small prisms, soluble 1 in about 1 of water. Contains 59·2% Quinine. Used hypodermically in cholera, in 12 to 15-grain doses.—B.M.J.E. ii./93,7.

Quininæ Iodas, Quinine Acid Iodate.

$C_{20}H_{24}N_2O_2.2(HIO_3) = 670·92$ (676·228 I.Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

In white needles, soluble 1 in about 250 of water. Contains 47·9% Quinine.

Quininæ Hydriodidum, *Syn.* Quinine Iodide.

$C_{20}H_{24}N_2O_2.HI = 448·74$ (452·25 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Is in minute pale-primrose coloured crystals, slightly soluble in water. Contains 71·7% Quinine.

Quininæ Hydriodidum Acidum. *Syn.* Quininæ Iodidum Acidum, Acid Quinine Iodide.

$C_{20}H_{24}N_2O_2.2HI,5H_2O = 665·04$ (670·308 I. Wts.).

Dose.—1 to 4 grains (0·065 to 0·26 Gm.).

Is in golden acicular crystals, soluble about 1 in 20 of water. Contains 48·4% Quinine. Must be kept from the light. A saturated solution (about 2 grains in an ounce) in syrup of ferrous iodide forms—

Syrupus Ferri et Quininæ Iodidi.

Dose.—1 drachm (3·5 Cc.).

Quininæ Di-iodo-hydriodum, Quinine Iodo-Hydriodide, Quinine Periodide.

$C_{20}H_{24}N_2O_2.HI + I_2 = 700{\cdot}54$ (706·19 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

Brownish, crystalline insoluble powder. Rich in iodine, which it liberates readily. Contains 45·9% quinine.

Quininæ Hypophosphis.

$C_{20}H_{24}N_2O_2$, H_3PO_2=387·40 (390·296 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

In crystals or powder. Slightly soluble in water, more soluble in alcohol 90%. Contains 83·1% quinine.

Quininæ Lactas, Quinine Lactate.

$C_{20}H_{24}N_2O_2.CH_3.CHOH\ COOH = 411{\cdot}21$ (414·320 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.), or more.

A granular white amorphous powder, soluble 1 in 10 of water; said to be well tolerated. Contains 78·2% of quinine. Is very suitable for hypodermic injection. For gonorrhœa, 1% solution forms an excellent injection.

Quininæ Lygosinas. *Dose.*—1 to 3 grains (0·065 to 0·2 Gm.). The Quinine Salt of a Coumaric Ketone

$$C_6H_4 \begin{cases} O(HC_{20}H_{24}N_2O_2)(C_{20}H_{24}N_2O_2H) \\ CH=CH-CO-CH=CH \end{cases} \Bigg\} C_6H_4 = 891{\cdot}91\ (898{\cdot}656\ \text{I. Wts.}).$$

in red powder containing 72% quinine. Soluble in alcohol.

Gauze and wool are medicated with 5 and 10%. Is antibacteric and employed for ulcers.—Y.B.P. 1905,271.

Quininæ Phosphas.

$2[C_{20}H_{24}N_2O_2], H_3PO_4 + 8H_2O = 884{\cdot}04$ (890·696 I. Wts.). Composition varies with manufacturers.

Dose.—1 to 6 grains (0·065 to 0·4 Gm.). Is in acicular crystals like the sulphate, but harder and denser. Contains 72·8% quinine. Soluble 1 in 420 of water.

Quininæ Salicylas.

$2C_{20}H_{24}N_2O_2.C_6H_4$ (OH)COOH + H_2O (U.S.) = 935·58 (935·54 U.S. Wts.) (942·656 I. Wts.).

Dose.—2 to 6 grains (0·13 to 0·4 Gm.).

White crystals, sparingly soluble in water, and soluble about 1 in 60 of alcohol 90%. ***Incompatible*** with mineral acids—salicylic acid may crystallise out. Contains 68·8% of quinine. Should be given suspended in water, or in cachets, or pills with syrup of glucose; recommended for diarrhœa and neuralgia.

Effervescent Quinine Salicylate.

Dose.—1 drachm. Contains 1 grain in 1 drachm.

Tablets, 3 grains (0·2 Gm.). *Dose.*—1 to 2.

Capsules contain 5 grains (0·3 Gm.).

Useful in rheumatic gout, 3 grains every 6 hours.—L. i./80,540,582; curative of zoster.—Pr. lxx.10.

Quininæ Sulphas, Quinine Sulphate (*Off.*). **U.S.**

(Termed '**Basic**' Salt in **F.E.**)

$[(C_{20}H_{24}N_2O_2)_2.H_2SO_4]_2$ + $15H_2O$ = 1750·24 (1763·48 I. Wts.). $(C_{20}H_{24}N_2O_2)_2.H_2SO_4$ + $7H_2O$ (U.S.) = 866·15 (U.S. Wts.).

The principal quinine salt, contains 73·5% of quinine.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.), tonic; 5 to 15 grains (0·32 to 1 Gm.), antiperiodic.

The proper relative doses are of Quinine 3 grains, Quinidine 5 grains, and Cinchonidine and Cinchonine 7 grains each. The latter is nauseous and liable to cause derangement to the stomach.

In slightly flexible acicular snow-white crystals, with intensely bitter taste. ***Soluble*** 1 in 800 of cold water, 1 in about 100 of 90% alcohol, 1 in 40 of glycerin. It is generally prescribed in solution or pills. To render ordinary doses of it soluble in water, a dilute mineral acid in the proportion of at least one minim to each grain should be ordered, the sulphate should be moistened with a little water before the addition of the acid, particularly if this be sulphuric acid. Tincture of orange-peel agreeably covers the bitterness.

Incompatible with alkalis and alkaline carbonates, also incompatible with Liquor Ammonii Acetatis (unless distinctly acid in reaction), iodides, and astringent infusions containing tannin. The addition of a small proportion of sodium hypophosphite may overcome the incompatibility with potassium iodide—*i.e.*, the

formation of herapathite (quinine iodosulphate).—P.J.ii./05,863. To alter the precipitation with alkalis, mucilage of acacia should be prescribed in the mixture, which prevents the aggregation of the alkaloid and holds it suspended in the liquid.

Uses.—Quinine came into notice from its specific curative power over ague and malarial fevers, and it has the power of warding off attacks. It has since been used to combat other forms of fever; it checks the pain of neuralgia and relieves headache of nervous origin; it combats whooping cough, influenza and hay fever; it increases uterine action, and is the most generally useful tonic drug. In cases of fever, large doses are thought to be more efficacious with the sulphate of quinine not dissolved. It may be given in cachets, or diffused in water if lightly powdered. It can be conveniently formed into pills by adding to 4 parts 1 of glycerin of tragacanth, carefully avoiding excess of the latter, or strong sulphuric acid in the proportion of one drop to five grains, makes a good pill. Its solution possesses antiseptic properties, and has a blueish fluorescence.

Quinine may also be administered by Kataphoresis, *q.v.*

Quinine affects metabolism. The total solids excreted by the urine may drop 40% within 24 hours after a single dose. It is eliminated unchanged by the kidneys.—Dixon.

Capsules contain 1, 2, 3, and 5 grains.

To obviate possible quinine deafness, where large doses have to be given, as in malaria, Hydrobromic Acid or one of the Nitrites is useful.—L.i./03,1488.

Quinine, locally applied, arrests suppurative process in hypopyon.—L.i./92,15.

Catarrh relieved by pills of Quinine, Atropine, and Arsenic. These will frequently stop the development of a "cold." See p. 158.

In typhoid, phthisis, and pneumonia. — L.i./91,930; P.J. 1891,980.

The Ammoniated Tincture of Quinine is considered the best prophylactic against influenza.

For delay and hæmorrhage during labour, in place of ergot, 8 grains followed by 4 grains in an hour, and a third dose if necessary, where no obstruction.—B.M.J. i./98,762.

Tetanus has followed hypodermic use of 20% quinine solutions; crystals may form in the wound.—B.M.J.E. i./02,63.

Corneal ulcers treated by 1% solution of sulphate with dilute sulphuric acid, *q.s.* L. i./05,360—the bisulphate would be preferable.

Whooping cough well treated by doses of as many decigrams

as the child is years old, or as many centigrams as it is months old, thrice daily.—Med. Record, July 22/05.

Rheumatoid arthritis, acute form during pyrexia, quinine best treatment for—see also guaiacol carbonate.—Pr., July, 1905.

Malaria treated by 4 doses of 7½ grains at intervals of ½ hour in the evening of every third day during the first fortnight of the fever; or for the pyrexia of malaria, large doses—15 to 20 grains, with 15 to 20 minims of Laudanum.—B.M.J. ii./04,1451. Malaria, results in.—B.M.J.E. i./06,20.

In Blackwater fever give 15 grains on two successive days, at 10 days' interval.—B.M.J.E. ii./04,83.

As prophylactic to malaria. In taking Quinine as prophylactic to bear in mind that it destroys the parasite more surely at moment of sporulation—as a rule, *i.e.*, once in 48 hours; take 10 to 15 grains once every 8 days instead of small quantities daily.—B.M.J. ii./05,1289.

To be given a few hours before the paroxysm. It has little effect on the young endocorpuscular forms of the parasite. Quinine retards the activity of Pepsin and Trypsin and to some extent that of ptyalin and diastase.—Dixon.

Amœbic abscess of liver treated by Quinine Injections.—B.M.J. i./06,1397.

Dysentery best treated by quinine and sulphuric acid.—B.M.J. i./06,1326.

Collunarium Quininæ, Quinine Nasal Douche.

Quinine Sulphate 1, Water 875.

Dissolve by the aid of gentle heat. Used in hay-fever, a little is placed in the palm of the hand and drawn up through the nose. If a stronger solution be required the Acid Sulphate or Hydrochloride of Quinine should be used; an excess of acid for this purpose should be avoided.

Mistura Chlori cum Quinina (Burney Yeo).

To Potassium Chlorate, in powder, 30 grains, in a 12-ounce bottle, add Hydrochloric Acid 60 minims; cork and shake well to liberate chlorine; absorb this by gradually adding, and shaking after each addition, Distilled Water *q.s.* to 11 ounces; add Quinine Sulphate 24 grains (or 36 grains if ordered), Syrup of Orange 1 ounce. *Dose.*—1 ounce (30 Cc.) every 2, 3, or 4 hours for typhoid; it quickly cleanses the tongue.

Perles of Quinine Sulphate

Contain 1½ grains (0·1 Gm.) in each.

Pilula Quininæ Sulphatis (*Off.*).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Quinine Sulphate 30, Tartaric Acid 1, triturate and add to Glycerin (by weight) 4, Tragacanth in powder 1, previously mixed. Pills of 1, 2, 3, 4 and 5 grains are prepared. **Tablets**, 1, 2, 3, 4 and 5 grains.

Quinine Sulphate with Carbolic Acid in a pill will

tend to liquify; a reaction takes place, sulphocarbolate may be formed and water of crystallisation be thrown out.—B. & C.D. i./05,103.

Tinctura Quininæ Ammoniata (*Off.*).

Dose.—½ to 1 drachm (1·8 to 3·5 Cc.).

Quinine Sulphate 2, Alcohol (60%) 90; mix and add Solution of Ammonia 10. The Quinine precipitates on addition to water; a few grains of Tragacanth powder will suspend the precipitate in a mixture; mixed with an equal quantity of syrup of orange-peel, it is palatable, keeps bright, and bears dilution better; it remains bright if mixed with aërated water. It is best kept in a dark place, or it will darken in colour.

Capsules of the above are prepared, each equivalent to 1 drachm.

Tinctura Antiperiodica. *Syn.* **Warburg's Tincture, B.P.C.**

Socotrine Aloes 240 grains, Rhubarb 80 grains, Angelica Fruit 80 grains, Elecampane Root 40 grains, Saffron 40 grains, Fennel Fruit 40 grains, Prepared Chalk 40 grains, Gentian 20 grains, Zedoary Root* 20 grains, Cubebs 30 grains, Myrrh 20 grains, White Agaric, in powder, 20 grains, Opium, in powder, 2½ grains, Black Pepper 4 grains, Cinnamon 8 grains, Ginger 8 grains, Alcohol (60%) 1 pint. Macerate for 7 days, press and strain. Dissolve in the product:—Quinine Sulphate 175 grains, Camphor 20 grains. After 3 days filter, add Alcohol 60% *q.s.* to 1 pint.

The originally published formula showed that it was a proof spirit tincture, containing Quinine Sulphate 1 in 50, Socotrine Aloes 1 in 40, Opium about 1 in 4,000, Rhubarb 1 in 125, Camphor 1 in 500 with several aromatics. As it is apt to purge as above prepared, the aloes may be omitted *if so prescribed*.

Dose.—1 to 4 drachms or more (3·5 to 15 Cc.).

Originally directed for Indian fever, ague, &c., half an ounce as a dose repeated in 2 or 3 hours; before giving the first dose the bowels should be freely opened, and no food recently taken. Between the two doses nothing should have been taken but a little brandy or beef-tea, and this only if the state of the patient required it.

* The root of *Curcuma Zerumbet*.

In enteric fever and pneumonia was useful.—B.M.J. i./01,1339.

Quininæ Sulphas Acidus, Quininæ Bisulphas, U.S. Ph. Ned. Termed 'Neutral' Salt in F.E.

$C_{20}H_{24}N_2O_2.H_2SO_4 + 7H_2O = 544{\cdot}34$ (544·33 U.S. Wts.) (548·46 I. Wts.).

Dose.—1 to 10 grains (0·065 to 0·65 Gm.).

Usually met with in large rectangular prisms or masses of crystals; contains 59·1% of Quinine. Soluble 1 in 11 of cold water, and is therefore the most suitable salt for preparing eye lotions. Three grains to an ounce of water has a specific action on ophthalmic diphtheria. Malaria is well treated by injections of 4 grains daily for 5 days.—B.M.J. i./02,793. Is not compatible with Potassium iodide.

Tablets, ½, 1, 2, 3, 4 and 5 grains.

Tablets called **Livingstone Rousers**, contain Quinine Acid Sulphate 1 grain, Jalap 1½ grains, Calomel 1 grain and Rhubarb 1½ grains; are given to check malarial poisoning.

In purulent ophthalmia, hypopyon and keratitis *Guttæ* containing 3 grains of this salt with 12 grains of boric acid per ounce useful.—Oph., May, 1906, 303.

Quininæ Sulphocarbolas.

$C_{20}H_{24}N_2O_2.C_6H_4.OH.SO_3H = 494{\cdot}64$ (498·38 I. Wts.).

Dose.—1 to 6 grains (0·065 to 0·4 Gm.) in pill with glycerin of tragacanth. An amorphous white powder, soluble 1 in 680 of water, 1 in 74 of 90% alcohol. Contains 65% Quinine.

Quininæ Tannas, Quinine Tannate, P.G.

P. Austr. gives method of making from the sulphate.

$C_{20}H_{24}N_2O_2,3C_{14}H_{10}O_9 + 8H_2O(?) = 1423{\cdot}86$ (1434·64 I. Wts.).

Dose.—1 to 4 grains (0·065 to 0·26 Gm.). An amorphous yellowish white powder, obtained by the decomposition of the sulphate with a solution of tannin, contains 22·6% of Quinine and is slightly soluble in water and about 1 in 3 alcohol 90%. Being almost tasteless, is recommended for children, to be given in milk.

Tabellæ Quininæ Tannatis.

Contain 1 grain in a chocolate basis. This forms a well-disguised Quinine preparation, being well suited for administration to children when Quinine is required. H. recommends these for whooping cough.

Quininæ Valerianas.

$C_{20}H_{24}N_2O_2, C_4H_9.COOH = 423{\cdot}15$ (426·352 I. Wts.).

Dose.—1 to 4 grains (0·065 to 0·26 Gm.).

In white shining crystals, or an amorphous white powder with a slight valerianic odour, contains 76% of Quinine, soluble 1 in 110 of cold water; best given in pills; for nervous headache and hysteria.

Pills containing 1 grain each of the Valerianates of Quinine, Iron, and Zinc. Are efficient nervine tonics.

Quinine Ethylcarbonate. *Syn.* EUQUININE.

$$\begin{matrix} /OC_2H_5 \\ CO \\ \backslash\ OC_{20}H_{23}N_2O \end{matrix} = 393{\cdot}33\ (396{\cdot}304\ \text{I. Wts.}).$$

Dose.—3 to 15 grains (0·2 to 1 Gm.) in cachet.

A compound formed by the action of ethyl chlorocarbonate on quinine, in light masses of silky white needles, with little taste, sparingly soluble in water, more so by addition of dilute acid; easily soluble also in alcohol, chloroform, and ether. Suggested to replace quinine as having less taste and no unpleasant after effects.

Malaria, 5 cases, results as effective as quinine, but causes cinchonism.—B.M.J. i./98,551. May also be given in 4 grain doses twice daily as a prophylactic.—M./01,79. In whooping-cough is of great value.

Tablets contain 8 grains.

Aristochin. *Syn.* ARISTOQUININE. A di-quinine carbonic ester, in white tasteless powder containing 96% of quinine. *Dose.*—8 to 15 grains (0·5 to 1·0 Gm.). Given for malaria, typhoid, influenza, and in small doses for pertussis.—B.M.J.E. ii./04,44.

Chinaphenin. *Dose.*—3 to 20 grains (0·2 to 1·3 Gm.)

The Phenetidide of the above is a tasteless Quinine preparation given for similar complaints.

Quinoidine. *Syn.* CHINOIDINUM, P. Jap.

Dose.—1 to 5 grains (0·065 to 0·32 Gm.) or more.

The mixed amorphous alkaloids, obtained as a by-product in preparing salts of cinchona alkaloids. It is a brownish-black, resinous-like substance, has a vitreous fracture, nearly insoluble in water, is dissolved by acid solutions, which deposit on dilution. Solutions either in boric or sulphuric acid have been used as cheap febrifuges. The taste of these is very nauseous.

RADIOLOGY.

"X" Rays, discovered by **Roentgen** in 1895, are produced in a vacuum tube on the passage of an electrical discharge of high tension from a Ruhmkorff coil, at the point where the cathode rays (electrified particles emitted at a high velocity normally to the surface of the cathode) strike solid matter. In the old form of "X" ray tube this was the glass of the tube itself; in the new form (the invention of Jackson and others) the anti-cathode, which is also the anode and is usually of platinum, receives the rays from a concave cathode, which is of aluminium. They are focussed by its concave surface, and the "X" rays (ether vibrations or pulses) are propagated from the *front* of the platinum plate (which is set at an angle of 45° to the axis of the tube) in all directions into space at the velocity of light. They possess the power of exciting phosphorescence and fluorescence. In working from electric supply mains if current continuous, a high tension transformer is necessary, *e.g.* that of Gaiffe or Koch.

These ions or electrons produced by "X" rays have properties as follows:—

(1). They discharge an electroscope.

(2) They can be removed by filtering through a medium such as cotton wool (therefore not of gaseous nature).

(3) They carry a charge of electricity.

(4) They have the power of altering certain compounds, *e.g.*, the emulsion of Silver Bromide or Iodide contained in a photographic plate, in the same manner as the violet rays in the sun's light.

A large number of substances are almost *transparent* to the rays, *e.g.*, paper, leather, wood, soda-glass, mica, sulphur, indiarubber, cotton, wool and silk. Others, like bone and glass containing heavy metals, *e.g.*, lead, are *semi-opaque*. The metals are *opaque* in approximate proportion to their atomic weights—lead and platinum being almost entirely opaque, whilst aluminium is comparatively transparent. Iodine and Iodoform are very opaque.

Barium Platinocyanide screens are fluorescent to the rays and render the shadows of the opaque bodies visible. They are made by coating cardboard or other suitable

material with a film of Barium Platinocyanide* suspended in a solution of Celluloid in Amyl Acetate.

"X" ray tubes are often called "hard," *i.e.*, those with high penetrative power in which the resistance is great—and "soft," *i.e.*, with only slight penetrative power, hence producing a dull radiograph as the rays from it are stopped to the same extent both by flesh and bone. These differences are principally due to the different exhaustion of the tube, a very high exhaustion producing the hard effect, and one of only partial extent gives the soft or dull results; but the size of the electrode also affects the results, *e.g.*, a small cathode gives a high resistance and high penetration, and a large one the opposite effects. Best contrasts are obtained with a tube of medium softness.

Tubes are now made so that they can be regulated to any degree of softness, and are also automatically self regulating, so that when the resistance becomes too great, an alternative spark gap comes into play which liberates gaseous matter and thereby softens the tube.

In bi-anodal tubes an additional electrode of aluminium is fitted behind and to one side of the anti-cathode and is connected with it outside the tube by a piece of wire; this permits the passage of much heavier discharges, and the tube works "steadier." The glass of the tube is of soda-glass, but special bulbs, in which lead-glass is employed, with the exception of a window which is of soda-glass, are used for the application of the rays in skin affections. These obviate the necessity of shielding the normal tissue from the action of the rays. Special shapes are also made for the application of the rays by introduction into the uterus.

The value of a tube depends on its solid construction and the definition of the radiograph produced at a distance of a foot. Exposures necessary with good photographic plates (special rapid plates are made for "X" ray work) have to be ascertained for the particular

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*Action of Röntgen Rays on Platinocyanides:—

		Before dehydration.	After.
Magnesium	Platinocyanide	Vermillion	White
Ammonium	,,	Old Gold	Yellowish Pink
Potassium	,,	Greenish White	Yellow Ochre
Barium	,,	Green	Gold.

Science Abstracts, June 26th, 1905, Section "A" 1216.

tube employed. It is stated that for the foot and ankle the exposure should be three times that necessary for the hand, and for the trunk ten times. The arms and legs below the knee require about four times that for the hand; the abdomen may require thirty times that necessary for the hand. Exposures rarely exceed 5 minutes.

Bismuth carbonate suspension in Mucilage (1 drachm in the ounce) is used for pathological work, *e.g.*, to inject veins,—to outline them prior to radiographing.

A new composition "X" ray shield has been introduced by Cox, which effectually shields the operator and the patient from the rays.

Glass Shields, containing a high percentage of lead, are employed at the London Hospital with a window opposite the anode through which the rays pass, and have the advantage that the tube can be watched.

A new opaque shield suggested by Dr. Belot, of Paris, is made by Gaiffe; it has nozzles of different sizes and lengths.

The operator should at all times stand behind the plane of the anode.

Ionized air is believed to be injurious if breathed continuously; a large well-ventilated room should therefore be employed.—M. A. 1906, 60.

DEVELOPER FOR PLATES (Thomas's):—

No. 1.

Hydroquinone	160 grs.
Sodium Sulphite	2 ozs.
Citric Acid	60 grs.
Potassium Bromide	40 grs.
Distilled Water to	20 ozs.

No. 2.

Sodium Hydrate	160 grs.
Water to	20 ozs.

This works satisfactorily. It does not stain the hands.

Equal quantities of these solutions are used for developing. Some employ the soda solution diluted so as to develop slowly, and thus produce better definition, but for routine work this improvement takes too long.

The following also gives good results:—

No. 1.

Metol	50 grs.
Hydroquinone	150 grs.
Citric Acid	20 grs.
Sodium Sulphite	2 ozs.
Water	20 ozs.

No. 2.

Caustic Soda ..... 150 grs.
Water ..... 20 ozs.

Equal quantities of Nos. 1 and 2 being employed. Development is best conducted at 60° F.

As an aid to **Diagnosis** the "X" rays increase yearly in importance particularly in diagnosing pulmonary tuberculosis (B.M.J. ii./05,1681), pneumothorax, pleurisy, tubercle, aneurism, enlarged bronchial glands and for the detection of renal calculi.

Tubercular deposits can be demonstrated which have not been detected by ordinary means.

Some urinary calculi can be fairly easily detected but biliary calculi are too transparent. For the first mentioned the patient is examined lying on his face on a table with transparent top, with a transparent air cushion under the abdomen; movements of respiration can thus be overcome. The other method of procedure is to allow the current to pass at maximum inspiration or maximum expiration.—M.A. 1906.

Mackenzie Davidson (B.M.J. i./98,10) devised an apparatus for exact measurement and localisation of foreign bodies. Two exposures are made on the same plate, the tube being moved right and left of a zero point on a scale, without the patient moving. On developing the plate the negative shows two shadows of the foreign body. From these, measurements are taken by means of threads with a surface gauge; this gives the exact depth of the foreign body below the skin. Some prefer to work with two photographic plates instead of one as mentioned. This method is also employed for the measurements of bones, displacements, and especially for pelvic measurements. The "cross-thread localiser" is also useful for detection, localisation and estimation of the size of foreign bodies in the eye-ball and orbit. A piece of metal, less than a millimetre in diameter, can be detected in the eye. The removal of pieces of steel can be brought about by means of the electro-magnet.

The stereoscope applied to skiagraphs gives the object in relief and shows the true relation of the parts. A tube with good definition and which will allow of the shortest exposure is essential. The skiagraphs are taken from different points of view after displacing the tube

about 6 centimetres. By practice it is possible to combine stereoscopic pictures without the employment of a stereoscope.—B.M.J. i./98,372, ii./98,481,1669; IX. Congrès Périodique Internationale d'Ophthalmologie, Utrecht, 14–18 August, 1899.

Mackenzie Davidson's recent results with "X" ray stereographs of renal and other cases. Uric acid and ammonium urate calculi are almost as transparent as flesh. Calcium oxalate, phosphate and even a cystic oxide calculus are fairly opaque to the rays. Importance of co-operation between surgeon and radiographer. —B.M.J. i./06,137.

"X" Ray Apparatus, Notes on.—P.J, i./05,817.

Treatment.

In the treatment of cancer—undoubted malignant tumours—there is a marvellous melting away under the application of the rays, but sufficient time has not yet elapsed to designate such cases as cured.—Coley.

In lupus and rodent ulcer, however, definite cures have been effected.

Treatment of lupus, rodent ulcer, and other skin affections with "X" rays and the Finsen Light and the two combined, with satisfactory results. The mode of action of "X" rays is not bactericidal. They appear to act by retarding osmosis and causing a slow degeneration of the cellular structure, probably due to leucocytosis. Lupus vulgaris, especially the ulcerative form (on ulcers the drying effect is most marked), scrofuloderma, tuberculous osteitis, and tuberculous glands, rodent ulcers, epithelioma, keloid, sarcoma, lupus erythematosus, acne rosacea, actinomycosis, mycosis fungoides, Paget's disease, nævi, eczema, psoriasis, acne, favus, sycosis, ringworm, and hypertrichosis have been satisfactorily treated by "X" rays. The rays cause the absorption of œdema.—B.M.J.i./03,1304.

Cancer, some good results. —L. ii./05,1318.

Malignant diseases of the breast, "X" rays in, and in tuberculosis (quinine to be given).—B.M.J.E. i./05,23.

1,000 cases of **lupus** treated. Small superficial quiescent patches curable. Finsen's method of combination with "X" rays and caustics; this, however, is slow. Cautery or excision supplemented by Pyrogallol, Salicylic Acid, Silver Nitrate, and open-air treatment.—L. ii./04,1129.

In lupus of great value—L. i./03,105; L. ii./04, 1129.

In facial lupus excellent. But Finsen light better.—B.M.J. i./04,983.

Lupus, became epitheliomatous under the rays.—L. ii./05, 1331; L. i./06,983.

Lupus treated, and by Finsen light.—M.P., 1904,140.

In superficial tuberculosis, nearly 70% of cases of lupus cured. Tuberculous adenitis, 35% cured. In deep-seated

tuberculosis, results not so good.—Proc. Phila. County Med. Soc., May, 1905.

In Ocular Therapeutics.—For use in rodent ulcers and epithelioma of the eyelid, sarcomata and other growths, trachoma, tuberculosis of the conjunctiva, spring catarrh, blastomycetes, and scleritis.—M.P., Aug. 1905.

"X" rays in ophthalmic surgery—localising foreign bodies, for rodent ulcer of the eyelids, for trachoma and pannus.—L.i./03,579.

Eyelid Everter. A useful form has been arranged suitable for application of "X" rays in trachoma.—L. ii./03,461.

"X" rays have remarkable action on the reproductive organs. The spermatozoa of "X" ray workers have been found to become diminished or absent, even in the case of those who have not suffered from "X" ray dermatitis.

The action on the fœtus in utero is believed to be fatal, and this matter requires attention from the medico-legal aspect. Furthermore, the suggestion is made that degenerates might be rendered sterile under adequate supervision.—M.A., 1906,59.

Ringworm.—If extensive, the best treatment is the "X" rays, afterwards "finishing off" with Croton Oil.—MacLeod.

The hair is several months in growing.—B.M.J.ii./05,13,619. B.M.J.E.i./05,28. "X" rays reduce period of cure to 3 or 4 weeks.

Ringworm, good results. The tube should be of low vacuum, *i.e.*, "soft," because the rays are less penetrating and more easily absorbed.—B.M.J.E. i./05,8.

Ringworm treatment at Guy's. 20-minute applications; apparent somnolent effect of the rays on some children. Danger of treatment real but remote.—B.M.J. i./06,256.

Leukæmia treated; good results.—B.M.J.E.i./05, 16, 36, 51.

Myelogenous leukæmia treated; the uric acid excreted to be estimated daily.—L. i./06,1261.

Severe acne and chronic eczema cured.—L.i /06,908.

"X" rays in the diagnosis of lung disease.—B.M.J.i./03,1433.

Exophthalmic goitre; some cases greatly benefited. Further trial recommended.—B.M.J. ii./05,1249.

"X" rays have the action of an irritant. The nutrition of the patient is improved by them with a tonic and stimulating result. Of undoubted value in lupus and epithelioma. Has a pronounced effect on internal cancers. Of value after operation to prevent recurrence. Dermatitis within certain limits is desirable. A classification of diseases treated is given.—B.M.J.i./03,27. Pseudo-leukæmia well treated.—New York Medical Journal, April, 1903. Doubtful cures of carcinomata of the breast.—L.ii./03,126,130,271. Used to discover amount of pleural effusion.—L.i./04,568.

For resumé of results in cutaneous epithelioma, deeply-seated carcinoma, leukæmia, see M.A. 1906,71.

Ringworm.—Sabouraud in a lecture on the treatment of ringworm in Paris (1906), describing the apparatus employed, including use of necessary localisers to obviate going over the part twice, states that the distance employed is 15 Cm., and points out that the intensity of the source of radiation has to be determined by a chromo-radiometer.

Sabouraud's Pastelles consist of Bristol paper coated with an emulsion of barium platinocyanide in amyl acetate collodion. The alteration in colour caused in these pastelles at half distance, *i.e.*, 7½ Cm., is observed and forms the basis of the dosage. The hair depilates in 15 days. Dilute alcoholic iodine solution is used concurrently as pigment. The head remains bald for two months. The exposure must not be too strong or the growth of hair will be endangered. The cure is possible in six week.—L. i./06,1700.

Dangerous results to hands may follow long exposure. relieved by application of Salicylic Acid, Menthol, Cocaine and Lanolin.—Hall Edwards, B.M.J.ii./04, 995,

Dosage.—The quantity of rays that have passed is measured by Holzknecht's Chrono-Radiometer, consisting of a scale of 12 divisions or units "H" established by Pastelles, which change colour under increased radiation. The ideal method of estimation has not yet been hit upon. There are further the radio chronometer of Benoist, the quantinometer of Kienböck and the method of Milton Franklin by measuring the ionisation of the air produced by "X" rays.

Dosage to be standardised by Holzknecht's scale of Pastelles. — L.i./05,1715; or by those of Sabouraud.—B.M.J.i./05,359.

[**Electrolysis.**—The introduction into the skin of iodine, quinine, sodium salicylate, cocaine (*v.p.*280) by electrolysis (by a continuous current battery with electrodes of zinc or zinc and mercury has been attended with good results.—Archiv. Electrology and Radiology, Nov., 1904.]

High Frequency Current.

This consists of a condenser discharge through a coil of high self-induction, the resulting discharge being of very high rate of oscillation and of high voltage.

The high frequency apparatus illustrates well the inertia of electrons. The H.F. current prefers to "jump" an air gap rather than traverse a spiral rod of copper, and will cause a high-resistance incandescent lamp to light up which is short circuited by a top bar of copper.—Na., Jan. 06,285.

A new appliance for producing.—L.i./03,1247.

In dermatology, pruritus improved by. Eczema, good results. Effects partly due to the ozone produced.—B.M.J.E.i./03,24. In nerve diseases.—L.i./03,734. In trachoma.—L.i./03,237.

Warty growths on the face treated by 34 exposures of 5 minutes' duration disappeared.—L.i./03,105.

These waves modify the sensibility amounting almost to an anæsthesia. Their use is, practically speaking, painless. Pruritus, psoriasis, eczema, alopecia, zona, acne, impetigo, and lupus erythematosus have been treated with good results.—M.A. 1904,65.

Curative results in lupus vulgaris, acne rosacea, and nævus, with disintegration of growths.—B.M.J.E. i./04, 39. General tonic to the system. Relief of neuralgia, ataxy, neurasthenia.—L. i./04,725.

Lupus, ulcerated condition stimulated to heal by the effleuve.—B.M.J. i./04,983. In alopecia areata, and acne vulgaris, excellent results.—M.A. 1906,79.

Causes a rise in surface temperature of the body.—B.M.J. i./06,923.

Foulerton expresses opinion on the action of high frequency on bacteria, the effects, *e.g.*, on lupus are due to the action of the nitrous and nitric acid formed in the air by the high frequency discharges.—L. i./06,1384.

Fluorescent light, produced by painting the skin with an Eosin Solution 0·01 to 0·1% strength, and exposing the patient to sun or arc light. Nine cases of rodent and epithelioma treated. Heat is excluded by Calcium Sulphate and Picric Acid.—B.M.J.E. i./05,20.

Radiant Heat.

This treatment consists in employing the heat and light produced by a number of ordinary incandescent electric lamps within a shade or case, or specially covered bed of reflecting material.

Special arrangements are made for each limb, joint or part of the body. The dry hot air produces a local hyperæmia and so relieves painful joints, chronic rheumatism and rheumatoid arthritis. Machtzum also combines hyperæmia produced by steam and light action.

Finsen Lamp.

The concentrated light produced by this lamp is violet and ultra-violet. It is produced by an arc lamp in which the heat rays are cut off. Finsen's original lamp has been improved, and is known as the "Finsen-Reyn" lamp. It is portable, suitable for one patient at a time, and Finsen acknowledges its efficacy.—L.i. /03,449.

Injections of fluorescent substances, *e.g.*, Æsculin (*v.p.*725) are sometimes used as adjuvants.

Erythrosin (an aniline dye)—the Sodium Salt of Tetra-iodofluorescein (iodo-eosin).—Solution 0·2% injected prior to light treatment causes reaction but pain.—B.M.J.ii./04,983.

Exposure is never less than 1 hour. If the lupus be ulcerative the case is first treated with "X" rays until it dries up before using the light. If the lupus be thick and warty, creosote and salicylic acid plaster is first employed to reduce. The opsonic index in obstinate cases is taken at the London Hospital, and, if low, Tuberculin is injected until it reaches 1·4 or 1·5. This is said to accelerate the treatment.—M.A., 1906,71.

A new form of lamp—small, automatic, working direct from the electric supply main.—L.i./03,531.

Lupus is undoubtedly best treated by.—L. i./03,591, 661 ; B.M.J.i./03,523,579 ; M.P.1904,140.

Finsen recorded 800 cases of lupus treated in various parts of the body.

The rays obtained from carbon electrodes are more effective than those given off by iron ones. The current used in the lamp has a strength of 40 to 80 ampères and an E.M.F. of from 45 to 50 volts. Rock crystal lenses are employed which allow of the complete passage of the ultra-violet light.—Finsen Light Institute at Copenhagen, L. ii./03,957.

Ozœna treated with good results by modified Finsen method. Cocaine and Adrenalin used to produce anæmia of the tissue, the fetor disappeared and the power of smell returned.—B.M.J.E. i./04,52.

Ultra Violet Rays have been used in lupus with good results. A sun lens is used, and a "compressor" in which plain or coloured water circulates.—I.M.G. Oct. 1904,366.

The rays from a quartz-mercury lamp (rich in chemically active ultra-violet light) colour manganese glass violet within 12 hours. It is suggested that the mixture of Ferric and Manganous Silicate become changed into Ferrous and Manganic Silicate.—C.D. i./05,756 ; L. i./05,512.

On a new method of producing ultra violet rays by low tension high frequency currents.—L. i./06,587.

Blue Light, Redard's method of producing anæsthesia ; dental extractions under.—B.M.J.i./05,1200,1404.

Violet Light has been employed. Cure of a case of chronic synovitis with effusion. Exposure of 25 minutes a day for 5 weeks.—Med. Woch., Sept. 2, 1902.

Finsen also employed **Red Light** for preventing the pitting of small-pox.

The treatment must be carried out before the period of suppuration. The patients are confined to rooms from which the chemical rays of daylight are excluded. Finsen's last article.—L. ii./04,1272 ; further note on, L. ii./04,1490.

Record of 18 cases of small-pox treated by the Red Light in this country with good results.—L. i./04,646.

Reflected Sunlight.

Sorgo, of Vienna, has treated laryngeal tuberculosis by the sun's rays reflected from a laryngoscopic mirror with success, but failed with syphilitic laryngitis.

The sun by its ultra-violet rays forms Ozone.—L. ii./05, 1933.

RADIUM.

Ra = 225·0 (I. Wts.).

This element is obtained from Pitchblende residues—Pitchblende found in Johanngeorgenstadt, Joachimsthal in Bavaria, Cornwall, and other parts, being the chief source of Uranium* for use in the arts. Radium is also present in the minerals Clèveite, Chalcolite, and others. So far it has always accompanied Uranium compounds. It is doubtful whether the Cornish Pitchblende, though containing a large proportion of Uranium, is worth working up in the direction of Radium.† Radium Bromide in the pure condition is the salt with which most work has been done, as the element in the free (basic) condition rapidly oxidises. This salt occurs in yellowish hard crystalline particles, and is usually supplied in hermetically sealed glass tubes, or in ebonite "buttons" having a mica front. Becquerel in 1896 commenced the experiments which led up to M. and Mme. Curie's work, by discovering accidentally the radio-activity of Uranium - Potassium Sulphate. It was thought that possibly "X" rays always accompanied fluorescence, as they seemed to result from the fluorescence of the glass in the old form of "X" ray tube. Becquerel found accidentally that a photographic plate was affected by the Uranium compound through a sheet of copper in the dark without any previous "lighting" being necessary to produce fluorescence. This result had, in fact, nothing to do with fluorescence; it was a general

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* An account entitled "Chemical investigations of Uranium, a newly discovered metallic substance," by Prof. Klaproth, will be found in the "British Critic," May to August, 1793.

† London Water below the clay is radio-active, but the clay itself is said not to be so.

Springs feeding the river Avre are radio-active. The most radio-active of these is the most free from *B. coli communis.* —J.C.S.A., Apl. 1906, 212.

Madame Curie obtained, amongst others, the following values for various Pitchblendes:—

Johanngeorgenstadt (Bohemia)	i=8·3
Joachimsthal	7·0
Cornish pitchblende	1·6
Clèveite	1·4
Orangeite...	2.0
Carnalite	6·2
Chalcolite (uranium phosphate)	5.2

This last body she prepared artificially, and found it to have a "normal" discharging power.

property of Uranium compounds, whether fluorescent or not. The energy of this radio-activity is now generally believed to be due to change which the elements are undergoing. The energy of Radium may be taken to be about one million times that of Uranium; Radium will fog a photographic plate in a few seconds, whereas Uranium will take hours to produce a like effect. Some controversy has arisen as to whether radio-activity is the result of an atomic breakdown (Ramsay, Soddy, Rutherford) or a molecular change (Armstrong and Lowry, Proc. Roy. Soc., 1903). The radio-activity of selenium with low atomic weight (79) has been brought forward in support of the latter theory.—Na., Sept. 22, 1904, 506.

M. and Mme. Curie's electrical experiments led to the conclusion that there must be present in Pitchblende an element many times more radio-active than Uranium —so far undiscovered by chemical analysis. On analysing Pitchblende it was found that the acid group precipitate (containing Bismuth with Polonium) had considerable, but the alkaline earth group the greatest activity.

To extract Radium in quantity the Pitchblende was roasted with Sodium Carbonate and lixiviated with warm water—the carbonates were then treated with dilute Sulphuric Acid — the Uranium passing into solution. The insoluble residue consisted of the sulphates of Calcium, Barium (with the Radium), lead, silica, &c. These were treated with Sodium Carbonate solution, and the Sodium Sulphate formed was removed by washing. Polonium and Actinium went into solution on treating the residue with dilute Hydrochloric Acid, whilst Radium, Barium, &c., remained behind. The residue was again boiled with Sodium Carbonate solution, converting the sulphates into carbonates. These were washed and treated with dilute Hydrochloric Acid. This solution contained Radium, Barium, Polonium and Actinium; the first two were precipitated by Sulphuric Acid. The sulphates formed were further purified and converted into chlorides, and by repeated fractional crystallisation, Radium Chloride (the least soluble) was obtained in pure condition. Giesel repeated the process, working finally with the bromides instead of chlorides; eight crystallisations being sufficient to remove the more easily soluble Barium Bromide. He

obtains about 0·25 Gm. of pure Radium Bromide from the ton of Pitchblende residues.

Characters of Radium.

The atomic weight of the element was found by Madame Curie to be 225 (taking Cl as 35·4 and Ag 107·8). Its should, therefore, be placed below Barium in the Mendelejeff series, and on the same line as Thorium and Uranium. These three radio-active elements have the highest atomic weights. Radium is divalent. Its spectrum was found to be characteristic, resembling those of the alkaline earths. It gives a beautiful carmine flame reaction.

The element is assumed to contain normal atoms and these in succession become the radio-active ones in minute proportion which are disintegrating. A freshly-prepared Radium Salt has its energy stored up and reaches its highest power in three weeks or so, which it maintains apparently indefinitely. The element emits rays, minute particles of matter, a portion of which has a velocity of 100,000 miles per second. The cathode rays in a Crookes' tube travel at about two-thirds of the velocity of light, which is 184,000 miles a second. A Barium-Platino-cyanide screen is lit up by the rays through varying thicknesses of metal according to the purity of the Radium and the amount used. The early experimenters soon found that the rays will burn the skin if kept in close proximity for a length of time. In addition to the Barium Platino-Cyanide, such substances as glass, quartz, sugar, sulphur, quinine sulphate, camphor, glycerin, water, &c., become luminous under the same conditions. Magnesium Platino-cyanide, which fluoresces well with "X" rays, does not respond so well to Radium. A tube of Radium wrapped in black paper lights up a diamond placed in proximity. Kunzite, an Aluminated Lithium ore found in California, is lit up with a red colour, and Willemite, *i.e.*, Zinc Silicate, fluoresces with a beautiful green colour.

If the current from an induction coil be made to spark across two gaps parallel to each other, and Radium be brought near to one the spark will cease passing across the other; also the proximity of a tube of Radium will increase the spark enormously when there is only one gap. It is claimed that this property of ionising

the air and rendering it more conductive, may at a future date be of very great value commercially.

The **chemical properties** of Radium are remarkable—as, for example, the fact that it converts corrosive sublimate into calomel. It decomposes water into hydrogen and oxygen (Giesel), oxygen is converted into ozone (Demarçay). It turns glass in its proximity to a violet colour, by some claimed to be a deposition of metallic ions—silica, as such, is not affected, as not being a salt, it contains no ions; it also turns salt blue, and yellow phosphorus into the red variety. Mercury is converted into the yellow oxide, and carbon dioxide is produced if material containing carbon is present when the emanation (*vide* below) is stored in an atmosphere of oxygen (Ramsay and Soddy).

Cloth is rotted by action of the emanation (Blythswood). Hydrochloric acid is decomposed, Chlorine being liberated. The rays emitted by a highly active preparation discharge a charged gold-leaf electroscope even through an inch or more of iron or zinc—5 milligrammes will do this at a distance of a few yards. They destroy the vitality of seeds; mustard and cress seeds exposed for a considerable time to their action refused to germinate. On the skin of a rabbit the rays are said to have produced a reaction followed by marked increase in the growth of hair.

Tests for Purity.

In examining Radium, a glance at its luminosity in the dark is no criterion whatever as to the value of a sample, as within certain limits contamination with Barium will render it more brilliant.

Pure Radium Bromide ($RaBr_2 = 384{\cdot}92$ I. Wts.) should light up a screen through several copper coins. It should make Willemite fluoresce, as already mentioned. The exact estimation of activity by rate of discharge of an electroscope (Rutherford's method) is a somewhat difficult matter, but good Radium Bromide will discharge an electroscope with ease, and these simple tests (which can be made at the time of purchase) are a safeguard for the investor.*

* The instrument employed by Madame Curie to estimate the radio-activity of minerals consists of two plates, on one of which (connected with a battery and thence earthed) is placed the mineral to be tested. This, if radio-active, forms ions in the air, and the electricity passes to the other plate arranged above.

Glew's instrument (P.J. i./04,440; ii./04,254) for estimation of activity is simple and reliable. It consists of an electroscope with ground glass. A positive charge is accorded the leaf by the aid of a camel's hair brush. The time this charge will remain (usually a day or two) is noted. Markings are made on the ground glass at certain intervals, and on bringing a known weight of pure radium bromide, preferably in a metal box, to within a distance of a yard, the time taken for the leaves to fall is observed. Then if a pure sample causes the drop in sixty seconds it follows that the same weight of another specimen doing the same work in 120 seconds is only 50% pure, and so on.

In this method the β- and γ-rays are not measured directly (the α-rays do not come in at all, as they do not penetrate the metal box). The ionisation of the air produced by this 1% of the total radiation is measured.

The need for a satisfactory **Standard for Radium** and other radio-active substances has been discussed at the Roentgen Society. An Absolute Unit, to be called one 'Becquerel' or one 'Curie,' and a Commercial Standard to be known as one 'Ray,' are suggested. A Radium Standard would be preferred to the customary Uranium Unit. *Vide* J.R S., April and July, 1906.

Theoretical Considerations.

It is now pretty well agreed that the successive decomposition (Chemical News, 1904, 200) of the element uranium is represented by the following:—

U→UX→Ra→Ra Emanation→Emanation X→He.

The Uranium X, Radium Emanation and the Emanation X transform so rapidly that only very small amounts of them are found in minerals. Uranium separated from uranium X reaches its one-half value again in twenty-two days. The disintegration theory has received great elaboration, notably at the hands of Rutherford, who describes radium A, B, and C, the last-mentioned falling into α, β and γ rays. There is, further, radium D and E, the E body being evidently identical with polonium.

Na., Dec. 15, 1904, p. 151; Feb 9 1905, p. 341.

The amount can be counterbalanced by a current of opposite sign produced by weights suspended to a crystalline quartz plate. This latter phenomenon is known as Piezo-electricity.—For further details of this method see Soddy," Radio-activity,' p. 60.

The radium observed experimentally to be produced by uranium is about $\frac{1}{500}$ the quantity it should be (Soddy). The too low rate of production will in all probability be explained at a later date, as experiments are being conducted with a view to elucidating the discrepancy. (Na., Jan. 26, 1905, 294.)

Some work conducted at Issy l'Eveque is stated to prove that Radium occurs in lead-bearing soils unaccompanied by uranium.

It has been frequently observed that glass tubes containing radium will crack spontaneously, the effect is due to the difference in potential caused by the retention of the charged α particles on the inside of the tube, and must amount to some thousands of volts.

Mackenzie Davidson recommends sealing a piece of platinum wire into the tube to prevent this accumulation.—L.i.06,1382.

Radium rays are of (at least) three kinds:—

The α rays, non-penetrating and slightly deviable in a strong magnetic field.

The β rays, more penetrating than the α, deviable.

The γ rays, exceedingly penetrating, non-deviable.

The α Rays.

A small quantity of Radium placed in front of a certain "active" variety of Zinc Sulphide (Sidot's Hexagonal Blende) in the form of a screen under a microscope gives a remarkable scintillating appearance (as exhibited by Sir W. R. Crookes' Spinthariscope, from the Greek σπινθαρίς, a scintillation) as of minute flashes of light bombarding it.

A Scintilloscope by Glew is also arranged showing the scintillations direct from Pitchblende, as well as from Radium, Polonium, Uranium, Thorium or any other radio-active substance. The fluorescent screen causes the α rays, which are positively charged particles travelling with a velocity of 20,000 miles a second, to be visible as they come in contact with it. This appearance is due perhaps to the rays cleaving the crystalline angular surface of the screen. In confirmation of this view it has been proved that the rays producing the phenomenon are very slightly deviable (Becquerel). This Zinc Sulphide is very markedly sensitive to the α rays and much less to the β. Barium Platino-Cyanide and Willemite, on the contrary, are more affected by the β than the α rays. The mass of these particles is about that

of Hydrogen atoms* and is enormous in comparison with that of the particles composing the β rays. This accounts for the feeble penetrative power of the former. In reality this energy is due to a continuous process of atomic change. According to Professor J. J. Thomson, Radium energy can proceed for at least 30,000 years. The α rays are absorbed by glass, and largely by mica, or a thin sheet of aluminium. They are more easily stopped the greater the thickness of matter opposed to them.

One must recollect that the Radium extracted as such now, will 30,000 years hence have almost ceased to exist, but there will have been simultaneously a reformation of no less amount in the mineral from which it was extracted.—Soddy, Na., Jan. 18, 1906,285.

The "law of density" governs the penetration of metals and other substances by these rays, the absorption being proportional to the density. Tin, however, is an exception both for the α and β rays; for the α it is about the same as aluminium, and for the β it is about three times as opaque as its density would indicate.

Polonium, another radio-active element, discovered by Mme. Curie in Pitchblende, gives off the α rays almost exclusively.

This element is precipitated with the bismuth; there are three methods of purifying it. 1. The active Polonium Sulphide is more volatile, and can be distilled *in vacuo*. 2. By the addition of water to the nitrates, the basic polonium nitrate is more readily precipitated than the corresponding bismuth body. 3. By means of sulphuretted hydrogen working in a strong hydrochloric acid solution the fraction precipitated is the more active.

This body is stated to lose half its radio-activity in nine months. Marckwald, who, in 1902 obtained it (under the name of Radio-Tellurium) by deposition on to a Bismuth plate from a solution of Pitchblende did not notice any deterioration. 2,000 kilos. of Pitchblende yielded 4 milligrammes of Polonium. For experimental purposes Bismuth and Copper plates about 1½ inch in diameter are supplied, having a coating of the element on the surface. By simply blowing over the surface of one of these discs, a charged electroscope placed a foot

* Soddy states they are proved to be Helium atoms (*v. p.* 621).

or two behind it may be discharged. These plates should be handled carefully, as the deposit is easily rubbed off with the finger. Indeed, a Spinthariscope may be prepared from one by rubbing the finger-nail over the surface with a piece of paper intervening. This removes a small quantity of the deposit. It is cut out and fixed above a Zinc Sulphide screen and is examined with a lens (Glew). The α rays emitted by this element have been made to stop a set of electric chimes.—P.J. i./04,183.

These rays can easily be shown with the aid of an electroscope to be stopped even by a sheet of paper, and are therefore probably of little effect therapeutically.

Strutt claims to have produced polonium from radium. An easy method of depositing polonium on a bismuth plate is described.—Na., Oct. 27, 1904,627.

A β-polonium with $\frac{1}{2}$ value 6·14 days is stated to exist.—J.C.S.A. April 06,212.

Polonium gives out large quantities of negative electricity in addition to the positively charged α radiation. The question is discussed whether the α particles lose their charge when passing through the cloud of negative ones near the polonium or whether they are alternately charged and discharged, the time during which they are uncharged being much longer than the time they are charged.—Thomson, Na., Dec. 15, 1904,166.

The β Rays are deviable in an electric field. They are 100 times more penetrating than the α rays, being reduced to half value by passage through 0·05 Cm. of aluminium They correspond to the cathode rays in a Crookes' tube, and have a velocity about two-thirds that of light, and consist of electro-negatively charged electrons about 1,000 million million times smaller than an atom of hydrogen, and the + particles of the α rays.

In addition to the four radio-active substances already mentioned, a fifth, termed Actinium, has been isolated in the ammonium hydrate group from Pitchblende. It gives off β rays. (A radio-active gas has been isolated from Cambridge, Ely, Birmingham, New Haven, U.S.A., and other waters, believed to be the Radium emanation. —Phil. Magazine, November, 1903. Bath water has also been shown to contain Radium in small quantity. The river Clitumnus, in Italy, has been suspected to contain it, in view of the fact that glass immersed in the stream soon acquires a violet colouration).—*See also* Mineral Waters, Igmandi.

These rays in all probability are responsible for the

burning and destructive action of Radium on the skin, and are actually productive of the curative results. A burn produced may take as long as four months to heal.

The α and β rays "ionise" the gas through which they pass, making it capable of conducting electricity. The Hon. R. J. Strutt has devised a simple apparatus for showing the dissipation of the negatively charged rays:—

A small tube containing Radium is supported in an exhausted glass vessel by a quartz rod; to the lower end of the tube an electroscope is attached, and the surface of the tube is made conductive with phosphoric acid. The + charge left behind after the β rays are carried away, is passed on to the leaves, which expand until one of them touches the sides of the vessel connected to earth, which causes them to collapse, and the operation repeats itself again and again indefinitely.—Phil. Mag., November, 1903. These pieces of apparatus are made to repeat every minute, and with the aid of a coherer may be made to ring an electric bell, devised by Glew.—Na, July 14,'04, 246. *See also* Rutherford, Na. March 2, '05,413.

A new Radium Electroscope has been arranged by Paschen (Phys. Zeitschrift, 5 Jahr. No. 6, p. 160) to show the β as well as the α radiation in one vessel. For description, see "Further Notes on Radio-activity."—P. J. ii./05,150.

The γ Rays are of the nature of "X" rays; they are given off by Thorium and Uranium also, and are about 100 times more penetrating than the β, being cut down to half value by 6 to 7 Cm. of glass or aluminium, and they will pass through 7 centimetres of lead before being reduced to 1% of their original strength. This being so, it will easily be understood that these rays are not stopped to any extent by clothing, rubber, glass, celluloid and a large number of metals. As a matter of fact, 99% of the total energy of Radium is due to the α rays, the β and γ being responsible for the remainder. Rutherford considers the γ rays are nearer in character to the cathode rays than to the "X" rays. The quantity of these rays must be so small that the therapeutic effects cannot well be ascribed to them.

Delta Rays.

A new type of radiation designated the Delta Ray has recently been described by Prof. J. J. Thomson:—

The Delta Ray is given off by a number of substances, *e.g.*, an alloy of Sodium and Potassium, also by rubidium, or, rather, by the sublimate obtained by warming rubidium in a vacuum tube, and consists of negatively charged particles travelling at a velocity about one-fiftieth of that of the β particle. This ray is, therefore, not very penetrating; it is, in fact, stopped by as small an amount as 2 Mm. of air.

Polonium and Uranium have been proved to give off these rays in addition to the plus charged alpha-rays. These two electricities tend to neutralise each other, but the negative Delta Rays may be deviated by a magnet—then the alpha-ray, having a greater mass, is only slightly bent, and the deviation is in the opposite direction.

The Delta Ray is shown by Thomson as follows :—A vacuum tube provided with a bulb containing charcoal is cooled by liquid air, producing a high vacuum. An electroscope is supported in the same by an insulating bead. It is charged with electricity; the attachment at the end of the terminal is a movable piece of iron wire, which, for charging up, can be brought in contact with the electroscope by moving a magnet. A negative charge is communicated, and the plus and minus radiations from the Polonium do not discharge the electroscope unless in a magnetic field at right angles to the charged surface; the negative Delta Rays being deviated as already mentioned, are prevented from crossing the space between the Polonium disc and the electroscope and the remaining plus rays have the power now to discharge it.

Professor Thomson has proved, by examining a large series of substances from different parts of the world, that this inherent radio-activity in such substances as aluminium and copper is not due to radium as impurity, as the leak from each series of substances is of the same kind and of about the same magnitude.

Heat Evolution.—Radium gives off heat, its temperature being always slightly higher than the surrounding atmosphere. It has been calculated that 1 Gm. in its existence evolves one thousand million heat units, *i.e.*, 100 Gm. calories per Gm. per hour, sufficient if converted into work to raise 500 tons of matter a mile; whereas a Gm. of hydrogen, our best fuel, burnt in oxygen will only yield 34,000 heat units, or one thirty-thousandth part of the output of Radium. It will melt its own weight of ice every hour. It has been stated that a cubic centimetre of Radium Bromide would generate, if properly insulated, sufficient heat to melt a glass vessel containing it. This heating is due to the enormous energy of the atoms spontaneously breaking up into the rays already described.

Observations have been made on minute specks of Radium Bromide heated on the platinum ribbon of the Meldometer, proving that its melting point is 728°C.

It was stated by one authority (Na. Dec. 15,04,151) that 50% of the heat emission was due to the γ ray. On the other hand, three successive stages of excited activity changing into each other have been demonstrated by Rutherford, and as it takes half an hour for the full heating effect to be shown by a thermo-electric junction, it is assumed that the heat is set free at a late or final transformation.

After being heated radium yields only 25% of its original

heating power, the remaining 75% having been driven off with the emanation, *vide infra*. Dobelle, in Paris, it may be added, has observed what is possibly an atomic breaking up of sulphur, *i.e.*, he found that on keeping two thermometers in a constant temperature, one of which is coated with flowers of sulphur, this one always registered about 2° lower than the other. Some substances, however, have the opposite effect.

Emanation.

Radium gives off an emanation which is self-luminous and of a gaseous nature, allied to the Argon family. This Emanation gas disintegrates in definite stages, and in doing so gives out the various rays. It is void of chemical activity, and follows Boyle's law; it is probably monatomic, with a density about 80 and atomic weight 160. (It follows from the kinetic theory of gases that the internal energy of the atom is independent of the temperature. Experimental proof of this is present in the case of the Radium emanation in which the activity is the same for such extremes as —180°C. and + 450°C.) The gas is given off without appreciable loss of weight of the original matter, and can be aspirated through a tube and be made to condense by freezing with liquid air.

It can be filtered through wool as distinct from cathode particles, *c.f. p.* 602. It has been found by Sir W. Ramsay and Mr. F. Soddy to give the helium spectrum on keeping; in fact, the emanation changes into helium, and possibly the α atom is an atom of this element (Soddy, Na., Jan. 18, 1906, *p.* 285, says that this has been proved). According to him the radium atom dispels successively five α particles, so that a residue of atomic weight 205 should be left if these are helium atoms. The Radium emanation cooled by liquid air commences to volatilise at —150°C. When kept under observation Ramsay found that in 3·7 days the amount of luminous gas was only half its original size, and in thirty days it was only the smallest pin-point in the tube. One hundred parts of Radium emanation changed into 3½ parts of Helium. It is probable that helium is a common product in the disintegration of all the radio-active elements—the ultimate products of these elements have yet to be discovered.

The emanation in the dry salt is in a stored up condition. It is liberated on warming or dissolving the salt in water. There is an equilibrium between the

quantity of emanation produced and the quantity decaying. Radium, as such, is still present in solution, and can be recovered by evaporating to dryness.

The emanation is continually being reproduced by Radium in solution, but it is not soluble in water at ordinary pressure; the part above the liquid is distinctly luminous, whereas the Radium solution is not.

Induced Radio-activity.

This emanation causes all substances brought into proximity, notably Willemite, to become radio-active and diamonds become phosphorescent. This is termed **induced radio-activity**. Thorium and Actinium emanations also induce or impart activity, and the activity in the case of Thorium lasts longer. The imparted activity is thought to be actually due to a non-volatile type of matter into which the emanation has changed. The radium emanation gives only α-rays, but the deposit from it gives off β also. Secondary β radiation may be well shown by placing a tube of radium above a photographic plate face downwards on a piece of metal, *e.g.* Platinum; there results an intense blackening of the plate, the image being the shape of the Platinum sheet taken.—Na., Sept. 15, 1904, 485; Feb. 23, 1905, 390.

Half Values.

The following table will be useful for reference:—

Radium	1,150 years.
Thorium Emanation	1 minute.
Induced activity by Thorium	11 hours.
Radium Emanation	4 days, nil in 30 days.
Induced activity by Radium...	28 minutes.
Actinium Emanation	A few seconds.
Induced activity by Actinium	28 minutes.
Induced activity on a negatively electrified wire in open air	40 minutes.

Taking into account the above indicated respective rates of decay of the emanations, it is easy by this means also, to determine the radio-active constituents of minerals. The emanation is driven off by heat and kept under observation for a time; those, for example, of thorium and radium, the most frequently to be searched for, are easily distinguished.

A given quantity of radium practically disappears in about 30,000 years; it decays at an inverse compound interest rate.

Helium (He = 4 I. Wts.) is occluded in various minerals. This suggested to Ramsay and Soddy the investigation which led to the proof that radium emanation consists in part of helium. The occluded gas is not found in non-radio-active minerals. The atomic theory, which has flourished for over

100 years—Dalton enunciated it in 1803—is now modified by physicists, in that they look upon the atom as the unit of matter, and the electron as the unit of force, matter and force to be considered as different manifestations of the same thing. The alchemist's dream only involves re-arrangement of the electrons; but, as pointed out by Sir William Ramsay, it is more probable that gold is changing into silver and copper than *vice versa*. If gold could be produced from an element with higher atomic weight, *e.g.*, lead, by atomic break-down, the energy liberated would be of much greater value than the gold—gold would be a mere by-product.—Soddy, Na., Jan. 18, 1906, *p.* 285.

Radium from Uranium?—Soddy corrects his original estimate.—Na., Jan. 26,05,294.

Origin of Radium.—Na., July 14,1904,246.

Slow transformation products of radium.—Na., Feb. 9,1905, 342.

50 mgr. Radium produce 0·000018 mgr. Helium in 60 days, or 0·0022 mgr. in 1 year from 1 Gm. of Radium Bromide.—Chem. News, May 27, 1904.

Regarding the size of electrons, Sir William Crookes says: The sun's diameter is about 1½ million kilometres and that of the smallest planetoid is 24 kilometres. If an atom of hydrogen be magnified to the size of the sun, then an electron will be about two-thirds the diameter of the planetoid.

We must not lose sight of the fact that these radio-active bodies are in all probability dangerous poisons acting directly on the nerve centres, and should be classified as such. If the radium emanation were used for criminal purposes the excited activity would have to be sought for, and in all probability would not be discovered, whereas if an actual radium salt had been administered even the ashes of the dead body would show the necessary radio-activity to convict the murderer.

The properties of the radio-active elements may be tabulated as follows:—

	RAYS.			Emanations.	Power of imparting Radio-activity to surrounding bodies.
	Non-penetrating.	More penetrating.	Exceedingly penetrating.		
i. Uranium ..	Yes	Yes	Yes	No	No
ii. Thorium ...	Yes	Yes	Yes	Yes	Yes
iii. Radium ...	Yes	Yes	Yes	Yes	Yes
iv. Polonium ...	Yes	No	No	No	No
v. Actinium ...	?	Yes	?	Yes	Yes

Experiments on Bacteria with Radium.

Radium rays acts on bacteria, firstly stimulating, and then at a certain point an inhibitory action sets in. Thus we read of an inhibitory action on *B. typhi abdom.* observed by German workers.—Medical Electrology and Radiology, V., 12.

The organisms of cholera, typhoid fever and anthrax are said to be killed by a three days' exposure to the rays from 25 milligrammes.—L. ii./03,1656; B.M.J.E. ii./03,31. A tube distant 2 mm. from a *B. typhi* culture sterilised it in three hours.—B.M.J.E. ii./04,56. Inhibited *B. coli*, &c.—L.

i./03,1829. See also L. i./03,620 (*B. typhosus*, and L. ii./03,1688.)

Bacterial colonies exposed three days to the β and γ rays emitted by 10 mgr. of Radium Bromide, and removed to a photographic plate, affected the plate even through a double layer of lead foil.—P.J. i./04,722.

Radium claimed at times to arrest development, and at others (shown in the production of parthenogenesis) to stimulate it.—M. Arch.,1905,33.

Experiments on Bacteria (by Green, Proc. Royal Soc. May 04), showed that the extraneous organisms in calf vaccine—*S. pyogenes aureus*, *S. pyogenes albus*, *S. Cereus flavus.* and *aureus*, were killed off by close contact with the rays (through a mica screen) in 10 hours. Similarly other micro-organisms were tested, all the non-spore-bearing bacteria being killed in from 2–14 hours exposure. The spore-bearing are more resistant.—B.M.J.E. ii /04,7.

Radium found in plants (chiefly in roots of peppermint, sage, arnica, cumin, etc.) near St. Petersburg.—C.D. ii./05,130.

Action on frogs and mice.—L.ii./04,846.

Therapeutic Use of Radium.

(I.) Radiation from Tubes and Mica covered 'Buttons.'

Remarkable results have been achieved with Radium in therapeutics. Lupus, rodent ulcer, and epithelioma have been cured by Juxtaposition. Dr. Mackenzie Davidson reports several cases treated by placing 5 milligram tubes in contact with the part for various successive durations of time :—

A rodent ulcer about an inch square on the nose, which had resisted Finsen and "X" ray treatment, was treated by about half-a-dozen applications of a 5 milligram tube with complete removal. There was no recurrence after nine months. This was the first case treated and cured in this country.

Tuberculosis verrucosa cutis on palm of the hand had been under treatment three years, two tubes applied for 20 to 30 minutes on seven occasions—cured.

Rodent cancer of nose. One and two tubes, eight applications about half hour each, cured.

Sir Oliver Lodge (Medical Electricity and Radiology, March, 1904) inclines to the opinion that radium for medical purposes will replace almost every other source of radiation. He believes that the beneficial action on rodent ulcer is due to the oxidising power of air ionised or ozonised by the rays; this, he concludes, is the reason why deep-seated cancer has not as yet been

benefited. Potent oxygen is necessary, produced, for example, by injecting hydrogen peroxide and rendering the latter active by penetrating rays. The oxygen must be in an unstable form such as exists in arterialised blood. If this is not the healing factor, it remains to be found out what is the actual cause, and to introduce this factor as near as possible to the diseased part.

Rodent ulcer. An almost hopeless case is recorded; the whole of the right cheek destroyed and tongue laid bare. In this case as many as eleven tubes were applied at once, together with a thorium pad. A rash like erysipelas occurred but subsided; the serum, blood, &c., was, however, sterile. The patient recovered.

Malignant mole removed. Radium can be applied in throat and regions inaccessible to "X" ray or Finsen light. No use in Carcinoma.—B.M.J. i./04,181; L. i./04,1046.

Radium in Cancer.—Na., April 20, 1905, 588.

Another case of rodent ulcer benefited. It was found that iodoform was more rapidly decomposed by the rays in the presence of sodium chloride—hence bathing with common salt to assist action.—B.M.J. i./04, 182. Another cured by Radium after failure of 'X" rays.—L. i./04,794.

Twenty-three cases of rodent ulcer treated without a failure. Paget's disease, etc., psorospermosis and superficial carcinoma also treated with excellent results.—Mackenzie Davidson, L. i./06,1392.

Useful in cases of lupus of the nose and mucous membrane of soft palate not easily reached. Nodules disappeared entirely.—B.M.J.E.ii./04,63; B.M.J. ii./04,983.

Effects on the nervous system (if prolonged and concentrated) are very pronounced, resulting in paralysis and death.—L. ii./03,1656. May prove of value in nerve diseases—in the treatment of neuralgia.

Radium preparations of low intensity applied to painful parts rapidly remove pain. Cures facial paralysis.—L. i./04,652.

Carcinoma of hard palate treated successfully by weak Radium preparation.—B.M.J.E. i./05,18.

In tabes dorsalis gave relief.—Gowers, B.M.J. i./05,5.

Rodent ulcer, Radium gives admirable results, particularly on eyelids applied one hour a day for several days.—B.M.J. i./04,1367.

Cancer and inoperable scirrhus satisfactorily treated

by Radium and "X" rays. The latter case also had Sodium Cinnamate.—B.M.J. ii./05,1496.

Epithelioma, Darier obtains satisfactory results using Radium Sulphate.—L. ii./05,548.

Radio-active water and Bismuth treated with Radium rays have been employed in cancer.—L. ii./04,1463.

Gastein mineral water (radio-active) as a vesical and rectal injection for enlarged prostate.—B.M.J.E.i./06,80.

The lesions caused by Radium on the skin are mainly the result of the disintegration of the organic compound lecithin contained in the leucocytes. Intracutaneous injections of solutions of this substance previously rendered radio-active produced a reaction similar to an intense Radium action. Proved by acting on lecithin in this manner and injecting.—B.M.J.E. ii./04,95.

In cancer may yet be hopeful.—B.M.J. ii./05,1318.

Nasal polypi treated without success.—M.P.ii./04,142.

Trachoma cured by Radium.—B.M.J.E. i./05,43.

Œsophageal cancer cured.—B.M.J. ii./05,92.

In benign growth good results, *i.e.*, with angiomata, lupus, nævus, keloid, and tuberculous ulcer of tongue.—B.M.J. i./05,39.

Rabies produced in animals by potent injection cured by Radium rays.—B.M.J.E. ii./05,40.

In consumption.—B.M.J. ii./05,197.

In asthma gave relief applied to the nose.—B.M.J. ii./04,1234.

No danger of Radium dermatitis if reasonable precaution be taken.—B.M.J. i./06,1288.

Actinomycosis; Ulcer on lobe of ear for 14 years, is recorded to have been cured in a month by applications of Radium for 15 minutes daily.

In **Ocular Therapeutics**, epithelioma, trachoma, inflammation of the uveal tract, rheumatic iritis, orbital neuralgia,—mostly good and encouraging results.—M.P., Aug., 1905. Ophthalmia is recorded to have been cured by Radium.

Simple cutaneous epithelioma and papilloma cured by one or two applications of Radium. Useful in non-malignant cases in general, and as a palliative in inoperable cases.—Oph., May, 1906, 300.

Applicators (MacLeod) for surface cases have the Radium tubes tied in, and may be bound on to part, *e.g.*, on an ulcer on the face—can be washed after use in septic

cases. An outer covering converts the tray into a box for carrying the tube in the pocket. Radium "buttons" having a thin sheet of aluminium in front, through which the β and γ rays pass, are supplied for similar purposes.

An applicator has also been arranged, suitable for throat and gynæcological, and another for nasal cases. They consist of a holder for the tube, attached to a pliable wire which can be "set" in any desired position.

A new Applicator (Hartigan's)—the size of a No. 12 Catheter for the bladder—has a spherical quartz front, and is useful in reaching the œsophagus, larynx, bladder, &c.—L. i./05,1582.

(II.) **Radium for use in cavities and the radiation for inhalation.**

Celluloid rods, plates, etc , may be coated with radium by means of Amyl Acetate, Alcohol, etc.—L. ii./05,544. These solvents attack the celluloid slightly, making the Radium adherent. This done, the instruments are varnished with Collodion to protect the layer. It is a good plan to colour both the Radium solution and the Collodion so as to be sure that the Radium is actually adherent. Rods or pencils thus treated have been used for inserting into cavities for wound treatment. Similarly all ordinary surgical instruments may be coated, and as the varnish coating is capable of being boiled these are sterilisable. A celluloid tube may be coated in this way on its inner surface, and be provided with stopcocks at each end and a rubber bellows and tube. The rays can thus be blown into the patient's lungs, or into the seat of a tumour or over the surface of it. The above is particularly useful for employing the α-radiation. It is worthy of recollection that surgical instruments can be rendered active in this way by inducing a secondary radiation on to them.

(III.) **Injection of Radium.**

On injecting a solution of Radium hypodermically it may be argued that the Radium will continue to generate emanation in the tissues, and thus prove of value in arresting the progress of maliguant growths. The strength of the injection suggested has been 1 Mgm. dissolved in 10 C.c. of sterile water—the average dose being 1 C.c. $= \frac{1}{10}$ Mgm. Specimens of urine from patients thus treated have been found to show a very slight radio-activity.

The first actual injection of Radium bromide in this country was conducted by Mackenzie Davidson, who employed this quantity, $\frac{1}{10}$ Mgm.

The Injection of Radium Emanation has also been suggested. The emanation at the moment it is liberated is, as it were, the active principle of the Radium. It may be mentioned that the emanation is particularly soluble in toluol. The employment of this method is not advised for general use. It has not been attended with satisfactory results in all cases.

The solution *painted on the surface* has also a marked effect on cancerous tissues.

Recommendation to try weak Radium Baths (far stronger than the mineral waters), to prove whether of medical value in this way.—Na., April 6, 1905, 530.

In addition to the radio-activity of all these inanimate substances, it has been suggested by **Blondlot** and others that nerves and muscles of the human body possess activity.—An exhaustive treatise on Blondlot's 'N' Rays.—Scot. Med. and Surg. Jl., April, 1904.

Human rays are said to actually exist.—L. ii./04,1380.

Résumé of knowledge of Radio-activity to date.—P.J. ii./04,254; B. & C.D. ii./04,391,404,446,468; P.J.ii./05, 150.

Comptes Rendus, 1902, vol. 132, p. 1289; Ber. der Deutschen Chem. Ges., Vol. 33, p. 3569; Phys. Zeitschrift, 3rd year, No. 24, pp. 578–579; F. Soddy, The Electrician, Oct. 1903, to Feb. 1904; P.J. ii./01,1, 639; ii./02,73,235; i./03,472,886; ii./03,268,781; C.D. ii./03,143; B. & C.D. ii./03,254,260. One or possibly two new elements in a Ceylon mineral.—C.D. i./04,635.

Revelations of Radium.—L. i./04,245. Action on animal tissues, eggs, &c.—B.M.J. i./04,382.

Soddy's recent paper on Radio-activity, from which several abstracts are given in this chapter.—Na., Jan. 18, 1906, 285; J.R.S., Feb., 1906.

Electroscopes, to make.—Na., Jan. 19, 1905, 274.

Radiobes are living things, according to Burke, generated in lifeless matter by the action of Radium; they are thought by many others to be a crystalline precipitate of Barium Sulphate. —L. i./05,1738; Na., May 25, 1905, 78.

A new Radio-active body from Actinium.—Na., June 26, 1905, 294.

The infection of Physical Laboratories with Radium leading to erroneous results.—Na., Mar. 16, 1905,460.

Rayleigh on the Dynamical Theory of Gases and of Radiation.—Na., May 18, 1905, 51.

Radio-active Crystals in Texas.—Na., June 29, 1905, 206.

Cutaneous Malignant Diseases (Illustrated) treated with Radium.—Le Radium, July 15, 05.

International Commission for examination of Radio-active substances suggested.—Na., Oct. 19, 1905, 611.

Radio-activity of rocks and earthy matter and possible connection with the earth's internal heat.—Na., Dec. 21, 1905, 173.

Does the α particle constitute the Helium atom?—Na., Jan. 25, 1906, 289.

Spectrum of Radium.—Na., Feb. 1, 1906, 334.

Scintillations seen from β rays.—Na., Feb. 8, 1906, 341.

Further references to Radium work prior to 1904 will be found in the 11th Edition of this work.

RANUNCULUS FICARIA.

Syn. PILEWORT or CELANDINE.

This drug has been used in the form of ointment. It is prepared by digesting the fresh Pilewort with melted lard 24 hours, and straining after the manner of Savin Ointment. **Suppositories** are made containing 72 grains of the ointment and 18 grains of Spermaceti; also, more convenient, a **smaller size**, containing 45 grains of the ointment and 15 grains of Spermaceti; have been employed in hæmorrhoids.—B.M.J.i./04,14; C.D. i./04,55; Birmingham Med. Review, May, 1901.

RESINA (*Off.*).

The residue after distillation of Oil of Turpentine from the crude oleo-resin of various species of Pinus.

Light yellow brittle substance, soluble in Alcohol 90%, also in Ether, Benzol. Used for making:—

Unguentum Resinæ (*Off.*)

Melt Resin 4, with Yellow Beeswax 4, and add Lard 3 and Olive Oil 4.

Ceratum Resinæ, U.S.

Resin 35, Yellow Wax 15, Lard 50.

Ceratum Resinæ Compositum, U.S.

Melt Resin 22·5, Yellow Wax 22·5, Suet 30, Turpentine 11·5 together, and add Linseed Oil 13·5.

Emplastrum Resinæ (*Off.*) (*v.p.*508).

Oleum Resinæ Empyreumaticum, P. Austr.

Yellowish or brownish oil by dry distillation of colophony. Sp. Gr. 0·96—0·99. Saponification No. 4-12. Iodine No. 50-80.

RESORCINUM, P.G.

Syn. **Resorcinol, U.S.**

$C_6H_4(OH)_2$=109·22 (*Off.* and U.S.) 110·048 (I.Wts.).

Dose.—2 to 8 grains (0·13 to 0·52 Gm.).

Metadihydroxybenzene is in white crystalline plates, melts at 230° F., and is easily volatilised.

Soluble 1 in 1 of water, 2 in 1 of alcohol, and 1 in 20 of olive oil.

Uses.—It possesses powerful antiseptic properties. It coagulates albumin, and has a caustic action on the skin, but a 2% solution is not irritating. It is an effective topical remedy in diphtheria, and produces no injurious consequences. A 5% solution may be injected into the bladder without causing any irritation, and is useful in inflammatory affections of this organ, likewise in vesical catarrh after gonorrhœa; 5 to 10% solution is of service also in syphilitic sores and skin diseases; and a 1% solution improves unhealthy wounds, and is useful as an eye lotion in conjunctivitis. Given internally, but with great care, it has a specific action comparable to quinine, but it is apt to produce profuse perspiration, and its antipyretic action is short; it is best administered well diluted with water and flavoured with syrup of orange or glycerin. In whooping cough 10 minims of 2% solution or preferably this strength employed as spray is of service, as also in hay fever.

In gastric ulcer 2 to 5 grain doses have combined antiseptic and analgesic action. ***Incompatible*** with Spirit of Nitrous Ether, and with caustic alkalis.

Whooping-cough has been treated by spray of resorcin, and a pigment to the larynx 1%.

It is useful as an application in diphtheria. Also given internally in hectic fever with night sweats; under resorcin 2 grains and quinine 3 to 5-grain doses an improvement rapidly takes place. It is applied locally to condylomata and mucous patches.

Pigment of 10% relieves irritation of tubercle of larynx. For eczema, cold cream with 2% of resorcin is useful.

Tablets, 3 grains (0·2 Gm.). *Dose.*—1 to 3.

Glycerinum Resorcin, G.H.

Resorcin 1, Glycerin 3, Distilled Water 1.

Lotio Resorcini. *Syn.* SPIRITUS CAPILLARIS.
Resorcin 1, Ether 1, Castor Oil 1, Eau de Cologne 10, Alcohol (90%) 35. Useful for dandruff and alopecia. *Soap and alkali must be removed before use, or hair may be discolored.*

Lotio Resorcini Composita, St. M.'s H.
Resorcin 10 grains, Methylated Spirit 1 drachm, Water to 1 ounce.

Lotio Capillaris.—A stimulant to the growth of hair. Resorcin 5, Capsicum Tincture 15, Otto of Rose *q.s.* Castor Oil 10, Alcohol 90% to 100.—M. Arch.

Lotio Resorcini et Acidi Borici.
Resorcin 1, Compound Tincture of Lavender 10, Glycerin 10, Saturated Solution of Boric Acid 80, as a mouth wash after operations on the mouth.

Nebula Resorcini.—For a common cold, spray nostrils with 1% solution, to which may be added an alkaline 'Solube,' *e.g.* Borax and Cocaine Co. (for others *vide* Index).—B.M.J. ii./05,1679.

Unguentum Resorcini Compositum. Ihle's Paste, St. J. H. *Syn.* PASTA RESORCINI, Mid. H.
Resorcin 20 grains, Zinc Oxide 22 grains, Starch 22 grains, Lanolin, Soft Paraffin, to 1 ounce.

Pasta Resorcini Fortior (Lassar and St. M.'s H.)
Resorcin 20, Zinc Oxide 20, Wheat Starch 20, Liquid Paraffin 40.

Pasta Resorcini Mitis (Lassar and St. M.'s H.)
Resorcin 10, Zinc Oxide 25, Wheat Starch 25, Liquid Paraffin 40.

Pasta Resorcini et Zinci Oxidi, K.C.H.
Resorcin 1, Glycerin 1, Zinc Oxide 1, Paraffin Ointment (white) to 8.

Unguentum Resorcini, L.H.
Resorcin 60 grains, Glycerin 1 drachm, Lanolin 2 drachms, Soft Paraffin to 1 ounce. St. J. H. has Resorcin 44 grains, Glycerin ½ drachm, Soft Paraffin to 1 ounce.

Baculum Resorcini St. M.'s H.—Resorcin 3, Wax 2, Lanolin 5.

Epithelioma treated successfully by 30% ointment with vaseline.—B.M.J. ii./90,96; Y.B.1891,203.

Unusually good results from resorcin plaster in rodent ulcer.—B.M.J.E. i./91,102.

For acne rosacea, with zinc oxide.—Pr. li.,380.

In alopecia, ointment, 1½ to 3 grains per oz., is useful.

Resorcin Monacetate. *Syn.* Euresol.

A honey-like mass. A substitute for resorcin, and from its oily consistence is particularly useful, when dissolved 10 to 30% in acetone, for application to those parts of the skin covered with hair.—P.J. i./99,54.

Thio-resorcin. A Resorcin and Sulphur compound, is a yellowish powder only slightly soluble in alcohol; it has been recommended as a substitute for Iodoform; 5% Ointment has been used for skin diseases.

RHAMNI FRANGULÆ CORTEX.

Frangula Bark (B.P. 1885). U.S. *Syn.* Black Alder (*Rhamnaceæ*).

Dose.—15 grains (1·0 Gm.).

Imported principally from Holland in thin quills with brownish exterior; contains the crystalline principle Emodin. Should not be employed until at least one year old (*P.G.Supp.*), or it is stated, it produces sickness and purging. It possesses tonic laxative properties and does not gripe. It is especially useful in cases of hæmorrhoids.

Extractum Rhamni Frangulæ, B.P. 1885.

Dose.—15 to 60 grains (1 to 4 Gm.).

Extractum Rhamni Frangulæ Liquidum, B.P. 1885.—1 = 1.

Dose.—1 to 4 drachms (3·5 to 15 Cc.).

The bark exhausted by boiling with successive quantities of water, the liquors concentrated, and spirit added.

Fluidextractum Frangulæ, U.S. 1 = 1 by hydro-alcoholic percolation. *Average dose.*—15 minims.

RHEI RADIX (*Off.*). U.S.

Dose.—3 to 10 grains (0·2 to 0·65 Gm.) repeated.

Single dose.—15 to 30 grains (1 to 2 Gm.) (*Off.*)

The erect Rhizome of *Rheum palmatum, R. officinale* and other species (and the variety *R. tanguticum*, U.S.) (*Polygonaceæ*) grown in China and Thibet, deprived of most of its bark and dried.

Uses.—Laxative and stomachic; often given with Sodium Bicarbonate, especially to children.

Tablets of Rhubarb, Soda and Ginger contain Rhubarb 3 grains, Sodium Bicarbonate 2 grains, Ginger 1 grain.

Colorimetric Assay.—All good rhubarbs containing from 2·8 to 4% of oxymethyl-anthraquinones comply with the test given in P. J. ii./05,580.

Extractum Rhei (*Off.*) *Dose.*—2 to 8 grains.

Prepared by extraction of Rhubarb Root with Alcohol 60% and evaporation to dryness. The **U.S.** preparation is made by concentrating the fluidextract (yield 35 to 40%) at not exceeding 50°C. Mixed with liquorice powder so that 1 = 2 of drug, the powder keeps well.—Caspari.

Extractum Rhei Compositum, P. Austr.

Extractum Rhei 6, Extractum Aloes 2, Resina Jalapæ 1, Sapo Medicinalis 1.

Fluidextractum Rhei, U.S. 1=1, Extraction with 75% Alcohol approximately. *Average dose.*—15 minims.

Liquor Rhei Concentratus.—*v.p.* 459.

Pilula Rhei Composita (*Off.*).

Dose.—4 to 8 grains (**0·26 to ·52 Gm.**).

Rhubarb 48, Socotrine Aloes 36, Myrrh 24, Hard Soap 24, Oil of Peppermint 3, Syrup of Glucose 44. This pill owes most of its purgative properties to Aloes, which forms one-fifth of its weight. It may be kept in specie (*sine* Glucose Syrup), 3 parts = 4 of mass. If the Oil of Peppermint 3 (which is objected to by pill manufacturers) were replaced by Menthol 2, dissolved in Alcohol *q.s.*, the pill would be improved.

Pulvis Rhei Compositus (*Off.*) **Gregory's Powder.** *Dose.*—20 to 60 grains (**1·3 to 4 Gm.**).

Rhubarb Root 2, Light Magnesia 6, Ginger 1. The Heavy Magnesia will produce a less bulky powder.

Tinctura Rhei Aquosa, P. Austr.

Dose.—1 to 2 dr. (**3·5 to 7 Cc.**).

Rhubarb sliced 10, Borax 3, moisten with Alcohol (70%) 20, set aside 1 hour, add Water 80, macerate 24 hours, shaking frequently, and filter. Sp. Gr. about 1·00.

Tinctura Rhei Vinosa, P. Austr.

Rhubarb 10, Orange Peel 2, Cardamom Seeds 1, Malaga Wine 100. Macerate 6 days, express and filter, and dissolve in 100 of filtrate, Sugar 15. Sp. Gr. 1·15.

SACCHARIN.

Glusidum. GLUCUSIMIDE (*Off.*); *Syn.*—BENZOYL-SULPHONIC-IMIDE. BENZOSULPHINIDUM, U.S.

$C_6H_4\langle^{SO_2}_{CO}\rangle NH = 181{\cdot}77$ (*Off.* and U.S. Wts.),

(183·14 I. Wts.).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) or more.

A derivative of toluene, obtained from coal tar, in white, intensely sweet, and minutely crystalline powder, rather light and flocculent. Its aqueous solution has an acid reaction; it forms crystalline sweet salts with alkaloids and metallic bases. Solutions of alkalis and their carbonates dissolve it, the latter evolving carbonic acid.

Soluble 1 in 400 of water, in alcohol 90% 1 in 25, in proof spirit 1 in 80, in ether 1 in 100, incompletely in chloroform, and in glycerin about 1 in 50. It is but slightly soluble in oils and fat,—olive, or cod liver oil does not dissolve one-quarter per cent. of it.

Uses.—This drug is largely used instead of sugar by diabetic patients and persons on special diets to reduce weight; large dose may disagree, and abdominal pain has been noticed from continued use.

Soluble Saccharin 2 grains, or 40 minims of the Elixir, in an 8-ounce mixture, disguises the taste of nauseous drugs, such as salicin, sodium salicylate, cascara, nux vomica, and strychnine, and is used to flavour gluten and cocoanut biscuits for diabetics.

Saccharin is generally sold standardised to a sweetening power of 300 times that of sugar. It is also prepared refined to a standard of 450 and 500 parts of sugar. Pure Saccharin is dissolved by Acetone.

Determination in foodstuffs.—Y.B.P. 1901,109.

Poisoning by Saccharin in Germany.—L. i./06,1,000.

Saccharinum Solubile, Soluble Saccharin, contains about 90% of Saccharin in combination with soda. In yellowish-white granular, micro-crystalline masses, easily soluble in water, and therefore convenient for flavouring purposes.

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) or more.

Elixir Glusidi, B.P.C.—*Syn.* **Elixir of Saccharin.** Saccharin 24 grains, Sodium Bicarbonate 12 grains, Rectified Spirit 1 drachm, Distilled Water 7 drachms.

RUBIDIUM.

Rb = 85·5 (I. Wts.).

The salts of this metal, on account of their higher molecular weight and greater electrolytic conductivity, have been thought to possess greater chemical activity than those of ammonium, potassium, and sodium, while resembling them in therapeutic action.

Rubidii Bromidum. Rb.Br = 165·46 (I. Wts.).

Dose.—5 to 30 grains (0·32 to 2 Gm.).

In white octahedral crystals, soluble 1 in 1 of water, with saline taste. Has been employed with good results in epilepsy. For cheapness,

Rubidium-Ammonium Bromide.

$RbBr3.NH_4Br$ = 459·556 (I. Wts.).

In white granular crystals, is often employed. In action is about equal to potassium bromide; more favourable in some cases. *Average dose.*—90 grains daily.

Efficient in epilepsy.—B.M.J. i./90,43.

Rubidii Iodidum. Rb.I = 212·47 (I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

In colourless cubic crystals, soluble 1 in less than 1 of water; odourless, with bitter saline taste.

Recommended in polyarthritis and syphilis, often tolerated better than potassium iodide, being said to have less action on heart, and to be less irritating to stomach.—P.J. 1893,341; B.M.J.E. i./94,8; L. ii./94,42.

RUMICIN.

Syn.—Rumin.

Dose.—1 to 4 grains (0·065 to 0·26 Gm.) in pill.

The dried extract of the root of *Rumex crispus*—yellow dock. Possesses astringent, tonic, and anti-scorbutic properties, and is given in scrofulous skin diseases and as a depurative in congested liver and dyspepsia. Yellow dock root contains Chrysarobin.

Tinctura Rumicis. 1 in 10 of proof spirit.

Dose.—1 to 10 minims (0·06 to 0·6 Cc.).

Unguentum Rumicis is prepared from the Fresh Yellow Dock Root 1, with Benzoated Lard 2 Warmed together 2 hours and strained. Used instead of Chrysarobin for chronic skin diseases.

SACCHARIN.

Glusidum. GLUCUSIMIDE (*Off.*); *Syn.*—BENZOYL-SULPHONIC-IMIDE. BENZOSULPHINIDUM, U.S.

$C_6H_4\langle^{SO_2}_{CO}\rangle NH = 181{\cdot}77$ (*Off.* and U.S. Wts.),

(183·14 I. Wts.).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) or more.

A derivative of toluene, obtained from coal tar, in white, intensely sweet, and minutely crystalline powder, rather light and flocculent. Its aqueous solution has an acid reaction; it forms crystalline sweet salts with alkaloids and metallic bases. Solutions of alkalis and their carbonates dissolve it, the latter evolving carbonic acid.

Soluble 1 in 400 of water, in alcohol 90% 1 in 25, in proof spirit 1 in 80, in ether 1 in 100, incompletely in chloroform, and in glycerin about 1 in 50. It is but slightly soluble in oils and fat,—olive, or cod liver oil does not dissolve one-quarter per cent. of it.

Uses.—This drug is largely used instead of sugar by diabetic patients and persons on special diets to reduce weight; large dose may disagree, and abdominal pain has been noticed from continued use.

Soluble Saccharin 2 grains, or 40 minims of the Elixir, in an 8-ounce mixture, disguises the taste of nauseous drugs, such as salicin, sodium salicylate, cascara, nux vomica, and strychnine, and is used to flavour gluten and cocoanut biscuits for diabetics.

Saccharin is generally sold standardised to a sweetening power of 300 times that of sugar. It is also prepared refined to a standard of 450 and 500 parts of sugar. Pure Saccharin is dissolved by Acetone.

Determination in foodstuffs.—Y.B.P. 1901,109.

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Saccharinum Solubile, Soluble Saccharin, contains about 90% of Saccharin in combination with soda. In yellowish-white granular, micro-crystalline masses, easily soluble in water, and therefore convenient for flavouring purposes.

Dose.—½ to 2 grains (0·032 to 0·13 Gm.) or more.

Elixir Glusidi, B.P.C.—*Syn.* **Elixir of Saccharin.** Saccharin 24 grains, Sodium Bicarbonate 12 grains, Rectified Spirit 1 drachm, Distilled Water 7 drachms.

Mix, dissolve, and filter. 20 minims contain 1 grain of Saccharin, sufficient to flavour a 4-ounce mixture.

Tablets of Saccharin. *Dose.*—1 or 2.

Contain Saccharin $\frac{1}{2}$ grain with sodium bicarbonate.

In making Saccharin Tablets it would either be better to employ the pure Sodium Bicarbonate or to use only half the quantity of ordinary Bicarbonate, which contains much Sesquicarbonate, $2NaHCO_3.Na_2CO_3.H_2O$, which is very alkaline and which produces much less Sodium Saccharinate than it would if pure. If impure, tasteless Sodium Sulpho-benzoate is formed. Method of estimation by extracting with Alcohol and estimating the Sulphur in the residue.—P.J. ii /05,230.

Dulcin.—*Syn.* SUCROL; PARAPHENETOL CARBAMIDE.

$CO<^{NH.C_6H_4.OC_2H_5}_{NH_2}$ = 178·83 (180·176 I. Wts.)

In minute white crystals, soluble about 1 in 800 of water, 1 in 25 of alcohol. Possesses sweetening power about 200 times that of sugar; is said not to interfere with appetite or create dislike after prolonged use. Is soluble in and disguises flavour of castor oil.—P.J. 1893, 888,985,443; L. i./94,1203.

SACCHARUM PURIFICATUM (*Off.*) U.S.

Syn. SUCROSE. $C_{12}H_{22}O_{11}$ = 339·60 (*Off.* & U.S. Wts.) (342·176 I. Wts.)

Crystals or powder, soluble 2 in 1 of water.

In addition to the B.P. Refined Sugar which is obtained from the juice of the Sugar Cane—*Saccharum officinarum* (*Graminaceæ*)—various grades of granular cane and beet sugar both with and without the addition of "blue" are marketed. For the manufacture of Syrups a sugar without the colouring matter is essential. U.S. allows also beet sugar.

Cane Sugar may (in the absence of a polarimeter) be approximately estimated by heating 1 Gm. of the same in 50 Cc. of water, to which 10 drops of hydrochloric acid have been added, for half an hour on a water bath. The solution is then cooled and neutralised with soda and made up to 100 Cc. with water, and the Invert Sugar thus formed is estimated with Fehling's Solution, 1 Cc. of which is approximately equivalent to 0·005 Gm. of Invert Sugar, the calculation being on the basis that 360 of Invert Sugar represent 342 of Cane Sugar.

Polarimetric Estimation.—A 10% solution at 20° has $[\alpha]_D$ = + 66·486°. - P.J. ii./04,714.

Syrupus (*Off.*)

Sugar 1, Water to 1½ by weight, Sp. Gr. 1·33. U.S. orders Sugar 85, Water to measure 100. Weaker strengths of syrup do not keep well. Potassium Carbonate 1 grain in 12 ounces of Syrup has been found to prevent crystallisation.—P.J. ii./05,750.

Invert Sugar is prepared by action of dilute mineral acid on Cane Sugar. Consists of a mixture, possibly a loose combination of equal weights of Grape Sugar (Dextrose) and Lævulose.

Lævulose.—*Syn.* Diabetin.

$C_6H_{12}O_6$ = 178 74 (180·096 I. Wts.).

A whitish crystalline lævorotatory powder, freely soluble in water; reduces Fehling's Solution. May be produced from Invert Sugar (above) by combining slaked lime with it in presence of water, pressing off the liquid Calcium Compound of the Grape Sugar, decomposing the residual Lævulose compound with Oxalic Acid or Carbon Dioxide, and evaporating the filtrate.

A stronger sweetening agent than cane sugar. Specially suitable for diabetics; is perfectly assimilated, none being found in the urine.—P.J.1893,888; ii./02,563.

It is also prepared of the consistence of honey, and as a syrup for microscopic work.

In the wasting of phthisis, it has been suggested to give Sugar in large quantities, *e.g.*, 4 to 8 ounce doses, with some bitter tincture or coffee to overcome intense sweetness. The Sugar is powerfully heat-giving and dynamogenic.—B.M.J.E.,i/05,32.

Of a 15% grape sugar solution, injected per rectum, 60·3% is absorbed in 2 hours, of cane sugar 51·5%, and of milk sugar 37·5%. The absorption is helped by 1% saline solution.—Li./06,1158.

SANGUINARIN.

Dose.—¼ to 1 grain (0·016 to 0·065 Gm.), in pill.

The powdered resinoid of a coffee-brown colour obtained from blood-root—*Sanguinaria canadensis* (*Papaveraceæ*) U.S. *Average dose.*—2 grains. In small doses, stimulant and tonic; in larger doses sedative, reducing the pulse, and increasing the expectoration of bronchitis, and relieves asthma; in still larger doses, emetic.

It is emmenagogue and useful in functional amenorrhœa, also useful in dyspepsia and gastro-intestinal catarrh.

Tinctura Sanguinariæ, U.S.

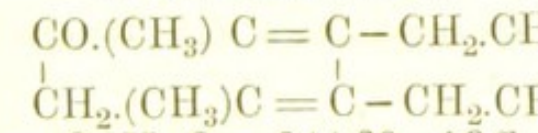
Average dose.—15 minims.

Sanguinaria Root 10, Acetic Acid 2, Alcohol 60, Water 40.

Powdered Extract of Sanguinaria of Commerce contains 10% Sanguinarin. Fluidextractum Sanguinariæ, U.S. 1=1. An acetic extractive.

Average Dose.—1½ minims.

SANTONINUM. (*Off.*) U.S.



or $C_{15}H_{18}O_3$=244·29 (*Off.* and U.S. Wts.) (246·144 I. Wts.).

Dose.—2 to 5 grains (0·13 to 0·32 Gm.) in sugar. U.S. *Average dose.*—1 grain.

A neutral crystalline principle. The inner anhydride, or lactone of Santonic Acid. U.S. obtained from Santonica, the dried flower-heads of *Artemisia maritima var. Stechmanniana* (*A. pauciflora*, Weber) (*Compositæ*). Exposed to sunlight it turns yellow.

Soluble 1 in 40 Alcohol 90% and in Oils (1 in 200 of Castor Oil), in Chloroform 1 in 3. Also in Caustic Soda Solution. Insoluble in water.

Uses.—It is an anthelmintic for round (*Lumbrici*) and threadworms (*Ascarides*), but is inoperative against tapeworm (*Tænia*) R. It colours the urine orange, and in too large a dose may cause objects to appear of a green or yellow colour. Hale White mentions that if urine be acid, a greenish yellow or saffron colour is produced, and if alkaline a purplish red. It relieves the lightning pains of tabes dorsalis. Hare recommends that immediately after taking a dose of Santonin a 2 or 3 grain dose of Calomel is to be given, followed by a saline purge six hours afterwards, the flow of bile being particularly useful in making the worm let go its hold. In urinary incontinence Santonin will often cure where all other remedies fail. Poisonous properties have been ascribed to it, probably due to impurities.

As an anthelmintic is very active in an oily solution, *e.g.*, **Haustus Santonini et Olei Ricini**, Santonin in powder 4 grains, Castor Oil 3 drachms. Mix and emulsify with Mucilage of Acacia 4 drachms. Syrup 1 drachm, Peppermint Water to 1½ ounces. The addition of Saccharin ½ grain is an improvement. Taken fasting in the morning makes a dose for a child of 6 to 12 years.

When this is inadmissible the Santonin may be combined in a tasteless form with Jalapin.

In gastric trouble of nervous origin and in epilepsy. —C.D. ii./05,1052 (*ex* Semaine Médicale).

Tablets, 1, 2 and 3 grains. *Dose.*—As Santonin.

Pulvis Santonini Compositus, Gt. Orm. H.
Santonin 2½ grains, Compound Scammony Powder 2 grains, Calomel ½ grain. For a child 1 year old.

V. C. H. has Santonin 1 grain, Compound Scammony Powder 2 grains.

Trochisci Santonini (*Off.*).
These lozenges contain 1 grain (0·065 Gm.) in each, with Simple Basis; one every night for a few nights should then be followed by an early morning aperient. U.S., ½-grain in each.

Suppositorium Santonini.
Contains 3 grains (0·2 Gm.), or more if ordered. Should be administered every 2nd or 3rd night, for 3 times. Is an efficient anthelmintic, especially for thread worms, which often infest the anus of children, causing them to have disturbed sleep.

In sprue, 3 grains morning and evening for three days. —Cantlie, B.M.J. ii./05,1281.

Ascaris lumbricoides apparently caused appendicitis.—B.M.J.i./06,677.

Santoninoxim, $C_{15}H_{18}O_2.N.OH$=259·23(261·192 I. Wts.).

A derivative of santonin produced by the action of hydroxylamine in an alkaline solution. Is less absorbable, and non-toxic, but equally active when administered in double or triple doses.—P.J. 1889, 1049. On account of insolubility is preferable to Santonin.—L. ii./92,1156. It kills the worm, whereas Santonin only paralyses it; to be followed by a purgative.—L. i./91,561.

SAPONES.

In soap-boiling caustic soda of high purity, 96-98%, is used for the best varieties. The lye employed (into which the melted fat is poured) has Sp.Gr. 1·075. Boiling proceeds with occasional further addition of lye.

The chemical reaction which takes place is indicated by the following :—

$$C_3H_5(O.C_{18}H_{35}O)_3 + 3\,NaOH = C_3H_5(OH)_3 + 3\,C_{18}H_{35}NaO_2$$

(Tri-stearin + Soda = Glycerin + Sodium Stearate).

$$C_3H_5(O.C_{16}H_{31}O)_3 + 3\,NaOH = C_3H_5(OH)_3 + 3\,C_{16}H_{31}NaO_2$$

(Tri-palmitin + Soda = Glycerin + Sodium Palmitate).

$$C_3H_5(O.C_{18}H_{33}O)_3 + 3NaOH = C_3H_5(OH)_3 + 3\,C_{18}H_{33}NaO_2$$

(Tri-olein + Soda = Glycerin + Sodium Oleate).

The soap thus produced is salted out with salt, and the glycerin formed is recovered as much as possible from the spent liquor. It is essential to ensure that the fats have been thoroughly saponified, as also that no marked excess of alkali is introduced. The next step is to clarify the soap by boiling with a fresh supply of water from any insoluble soaps, *e.g.*, Lime and Magnesium Salts of the acids indicated above. The "nigre" containing these impurities subsides in this manner to the bottom of the vessel. The soap is then allowed to slowly cool and "settle." When cooled to 165° F. the soap is removed to the frames to solidify. Here it remains for a month to consolidate, and drain through apertures in the sides of the containing vessel.

For **Household Purposes** this soap is then cut up with wires into bar form and stamped.

For **Toilet Purposes** special soap bases are employed containing a large proportion of Stearates (obtained from 'edible' animal fats—tallow). It is obvious that the fats must not be rancid or of strong colour. A high acidity and unpleasant odour would render the fat quite inadmissible. A proportion of palm oil is generally combined with the tallow.

After boiling and separating in the usual way, the melted soap is run into a tank and thence on to cool stone rollers, and then again on to metal rollers, arranged as in a printing press. A set of teeth is so adjusted against the rollers as to cut up the solidified soap into ribbons (**Cressonière Machine** costing £1,500). The shreds thus formed are dried by passing over a special wire mattress, which is circulating over heated air. In passing, the soap loses about 30% moisture—this loss can be regulated. The next stage is to break up the shreds and combine with colour and perfume through a milling machine with teeth attached, which again converts into ribbons, and at the same time the heat generated by the pressure masses the soap. The next process is the conversion into bar form by a **Plodding Machine**; finally the stamping into the desired shape is effected.

For **Shaving Soap** it is necessary to employ fats—'strong' tallow—with a high melting point.

Ordinary Household Soaps are made with vegetable oils of light gravity.

Good average soap can be produced by saponifying vegetable oils, such as those of Cottonseed, Palm, or Cocoanut (of this the best variety is known as "White Cochin" Oil, the second as "Ceylon" Oil); but these oils containing a large proportion of the Oleic Ester produce more soluble and hence wasteful soaps.

The use of resin in household soap is not at all injurious; on the contrary, resin soap is very soluble and lathers freely. The addition of the resin renders the soap smooth and prevents efflorescence. Further, the cleansing 'odour' imparted by the resin is liked by many. It is not, however, suitable for toilet purposes, and a large admixture cannot be allowed. Occasional additions to common soaps are chlorophyll, sodium silicate and French chalk.

Transparent Soaps are made by setting from methylated spirit. Many contain resin and sugar (as much as 20% of each). For further note on Soap Making, *v.* P.J. i./c6,316.

The following is the approximate composition of Pharmacopœial Soaps:—

Sapo Animalis (*Off.*), **Curd Soap.** Principally Sodium Stearate; made with Sodium Hydroxide and a purified animal fat consisting principally of Stearin:—Fatty Acids 60%, Combined Alkali 9%, Uncombined Mineral Matter 2%, Water 30%. Limit tests for Alkaline Hydroxide and Carbonate are imposed for this and the following—

Sapo Durus (Hard Soap) (*Off.*). CASTILE SOAP, principally Sodium Oleate. Manufactured with Sodium Hydroxide and Olive Oil:—Fatty Acids 60%, Combined Alkali 8%, Uncombined Mineral Matter 2%, Water 30%. It is soluble about 1 in 20 in Water. SAPO MEDICATUS, **Ph. Ned.** (Full directions for making are given.)

White Castile Soap and Mottled Castile Soap are trade varieties. **Mottle** is produced by addition of iron or the residues and scrapings of the lye tanks.

Sapo Mollis. Sapo Viridis (*Off.*), **Soft Soap,** consists principally of Potassium Oleate. Manufactured from Potassium Hydroxide and Olive Oil:—Fatty Acids 45%, Combined Alkali 8 to 11% (reckoned as K_2O), Insoluble Mineral Matter 1·0%, Water 35 to 45%, Matter insoluble

in Alcohol 3% officially allowed (Potassium Carbonate and Insoluble Soaps).—B. & C. D. ii./94,575.

Sapo Kalinus, P.G. iv. and P. Austr., is made with Linseed Oil. Soluble about 1 in 4 water, and 1 in 1 alcohol 90%.

The melting points of the fatty acids extracted distinguish these soaps with ease—45° to 50° C. is that of the acid (chiefly stearic) separated from the Curd Soap, and 25° C. is the average melting point of acids obtained from a soap, *e.g.* Sapo Durus, made with Olive Oil.—Ph.

Sapo Superadipatus, Ph. Ned.
Anhydrous Wool Fat 4, Potash Soap 20, Hard Soap 76.

Sapo Superadipatus cum Pice Liquida, Ph. Ned.
Anhydrous Wool Fat 4, Liquid Tar 5, Potash Soap 15, Hard Soap 76.

Sapo Superadipatus cum Sulfure Precipitato, Ph. Ned.
Anhydrous Wool Fat 4, Precipitated Sulphur 10, Potash Soap 20, Hard Soap 66.

To Soften Water, *i.e.*, to precipitate the dissolved Calcium Salts, so as to prevent them forming insoluble soaps during the lathering process, a small proportion of Sodium or Potassium Carbonate may be added to the water.

Perfumed Water Softeners are supplied.

Sterile Soap Solution, for Hypodermic use. 1%. *Dose.*—5 minims, increased. Carcinoma treated.—M.P., Oct. 19,04.

Hypodermic Sterules of this solution are supplied containing 1 drachm in each.

Sodii Oleas. *Syn.* EUNATROL.

$CH_3(CH_2)_7CH{:}CH(CH_2)_7COONa = 302{\cdot}02$ (304·314 I. Wts.)

This is prepared in 2 and 4-grain pills and is given to dissolve gallstones. Useful as cholagogue.

Sodium Oleate Capsules contain 5 grains.

Cholelysin said to be composed of a mixture of Sodium Oleate 10 to 15, Validol 5, Valerian Tincture 10 and Peppermint Water to 200. For use in gallstones. Tablets are made.

Medicated Soaps.

Biniodide, containing ½%, 1% and 3% mercuric potassium iodide, reliable antiseptic.
Boric acid 10%
Birch Tar 3%
Birch Tar and Sulphur 5% each.
Carbolic, toilet and medicinal, strength 5%, 10% and 20%.
Cyllin.
Eucalyptus Oil 5%.
Eucalyptus Oil & Menthol, 2½% and 5%.
Fel's Germicidal.
Formaldehyde 2½%.
Ichthyol, 5% and 10%, in skin affections.
Ichthyol and Salicylic Acid.
,, ,, Sulphur 5% each.
Ichthyol and Tar.
Lanolin and Ichthyol.
Lysoform, toilet and medicinal.
Menthol 2½%.
Naphthol and Sulphur 2½% and 10%.
Nicotine.
Oil of Wintergreen 3%.
Peruvian Balsam.
Price's Surgeons'.
Resinol.
Salicylic Acid 5%.
Sphagnol 15%.
Sublimate 1%.
Sulphur, precipitated, 10%.
Sulphur and Carbolic Acid.
Sulphur, Camphor & Balsam of Peru, of each 5%.
Sulphur, Camphor, & Carbolic Acid, of each 5%.
Thymol 2½%.
Vinolia, medical.
White Precipitate.
Wright's Coal Tar.

Linimentum Saponis (*Off.*). Soft Soap 4, Camphor 2, Oil of Rosemary 0·75, Alcohol 32, Distilled Water, 8. U.S. orders Soap (Hard) 6, Camphor 4·5, Oil of Rosemary 1, Alcohol 72·5, Water to 100. It is expeditious to dissolve the Soap with the Oil of Rosemary and the Camphor in most of the Alcohol, then add the rest of the Alcohol mixed with water.

Linimentum Saponis Mollis, U.S., has Soft Soap 65, Oil of Lavender 2, Alcohol *q.s.* to 100.

Emplastrum Saponis (*Off.*). Hard Soap 6, Lead Plaster 36, Resin 1.

Linimentum Saponis Viridis, St. M.'s H. Soft Soap ½ ounce, Methylated Spirit 1 ounce.

Spiritus Saponis Alkalinus (Hebra). Mid. H. has Sapo Mollis 4, Alcohol (90%), 2.

Spiritus Saponis Kalinus (SPIRITUS SAPONATUS, P.G.).

Is prepared by saponifying Olive Oil 6, with Liquor

Potassæ 7, and Alcohol 7½ in a stoppered vessel by frequent agitation. A small quantity of this product should mix clear with alcohol and water. Add then Alcohol 22½ and Water 17; filter.

'**Soap and Spirit Lotions**' are frequently ordered containing Soft Soap 1 in Alcohol 90% 2.

Ether Soap.

Dissolve Soft Soap 32 in Alcohol (90%) 20, allow them to stand 24 hours and decant carefully from any sediment, then add Methylated Ether Sp. Gr. 0·720, 52 parts. As a surgical detergent prior to operation.

Ether Soap with Mercuric Iodide, contains 1 in 1800.

Mercuric Iodide 25 grains, Potassium Iodide ½ ounce, Soft Soap 2 lbs., Alcohol 90% 1 pint, Ether *q.s.* to 5 pints.

Liquid Glycerin Soap.

A yellowish liquid containing 40% of Glycerin. A bland and soothing toilet preparation for delicate skins. It is a constituent of **Kalodont** and **Salicifrice,** and other tooth pastes.

Saponification Equivalents of Fats and Oils.

The *Saponification Number* or Köttstorfer's Number is the number of milligrammes of Caustic Potash which the fatty acids contained in 1 Gm. of the fat (free from moisture) are capable of neutralising. To 1·5 to 2·0 Gm. of the purified and filtered specimen for examination contained in an Erlenmeyer flask of about 200 Cc. capacity add 25 Cc. of $\frac{N}{2}$ Alcoholic Caustic Potash. Warm half an hour on water-bath with reflux condenser, with occasional rotation, add a little phenolphthalein solution and titrate excess of alkali with $\frac{N}{2}$ Hydrochloric Acid. Conduct a control using the alkali alone.

The difference in the number of Cc. of $\frac{N}{2}$ Hydrochloric Acid required to neutralise in the control and the actual test is easily converted into the number of Mgr. of KOH consumed by the amount of the fat or oil originally taken, and the result is expressed in equivalent of 1 Gm. of the specimen.

For Iodine Number of Fat, *see p.* 443.

SARSÆ RADIX, SARSAPARILLA. (*Off.*). U.S.

The dried root of *Smilax ornata* (*Off.*). (*Liliaceæ.*)

Imported from Costa Rica and known as Jamaica Sarsaparilla. **U.S.** defines *Smilax medica* (Chamisso

and Schlechtendal), *S. ornata* (Hooker), *S. papyracea* (Duhamel), or a root known as Honduras Sarsaparilla probably obtained from *S. officinalis*—*N.O. Liliaceæ*. Contains the glucosides Parillin, Sarsa-saponin and Smilacin.

Extractum Sarsæ Liquidum. (*Off.*) U.S. 1=1.

Dose.—2 to 4 drachms.

Liquor Sarsæ Compositus Concentratus (*Off.*).

Dose.—2 to 8 drachms (*see p.* 460).

Uses.—Sarsaparilla is employed mostly in conjunction with other drugs in chronic rheumatism, in skin affections and as a "blood purifier." Recently it has been brought forward again in the treatment of syphilis.

Incompatible with Alkalis.

The Decoctions and Mixtures of Zittmann and others are variously given by all authorities. We have endeavoured to clear up the statements as follows:—

Decoctum Zittmanni Fortius.

Dose.—3 to 6 ounces (90 to 180 Cc.).

Sarsaparilla (cut small) 200, Water 5,200, maintain at 35° to 40°C. for 24 hours, then add,—Potash Alum 10, Calomel 8, Precipitated Cinnabar 2. Heat on a water-bath for three hours and add,—Bruised Anise and Fennel of each 10, Senna leaves (cut small) 50, Liquorice Root (cut small) 20. Continue heating for 15 minutes, strain, and press, passing sufficient water through the marc to make up to 5,000. This formula practically agrees with that in *N.S.D.* The preparation in *P.G.* is as above with sugar in place of Calomel and Cinnabar.

Decoctum Zittmanni Mitius.

Dose.—3 to 6 ounces (90 to 180 Cc.).

Sarsaparilla 100, Water 5,200, Lemon Peel, Cassia Bark, Cardamoms and Liquorice of each 6. Proceed as in making the stronger decoction.

Zittmann's Decoction, L.L.

Dose.—1 quart taken warm every morning.

(i.) The Strong Decoction. Digest Sarsaparilla 4 ounces in water 24 lbs. 24 hours, and add, tied up in linen, Sugar and Alum, of each 2 drachms, Calomel 80 grains, Cinnabar 20 grains. Evaporate to 8 pints, and finally add Anise and Fennel in powder, of each 80 grains, Senna Leaves 1 ounce, Liquorice Root four drachms. Allow to stand one hour, press and strain.

(ii.) The Weak Decoction (L.L.). *Dose.*—1 quart cold in the afternoon. To the dregs from (i.) add Sarsaparilla 2 ounces,

Water 24 lbs., evaporate to 8 pints, and finally add Lemon Peel, Cardamom Seeds, Chinese Cinnamon Bark, Liquorice Root, of each 1 drachm. Allow to stand 1 hour and strain.

Kobert's Sarsaparilla Decoction.

Macerate Sarsaparilla 2 (with Water 8) for three hours. Boil 1 hour and press out. Repeat and evaporate combined decoctions to 2, mix with an equal volume of Alcohol 90%, wash out the residue with boiling Alcohol 90% 1. Strain through flannel, filter and evaporate to 1 or less. Finished product is standardised to contain 2% of the glucosides Parillin and Sarsa-Saponin.

Tertiary syphilis of malignant type successfully treated with these Zittmann's and Kobert's preparations.—B.M.J. i./06,62; L. i./06,1324.

Fluidextractum Sarsaparillæ Compositum, U.S.

Average dose.—30 minims (1·8 Cc.). Sarsaparilla 75, Glycyrrhiza 12, Sassafras 10, Mezereum (Bark) 3. Percolate with a mixture of Glycerin 10 and Diluted Alcohol 90; after macerating 48 hours, adding more Alcohol until drugs exhausted. Reserve first 80 of Percolate and evaporate remainder to soft extract, mix and make up to 100.

Discussion on value of Sarsaparilla Decoctions. Full doses valuable in the cachexia of syphilis and in other cachectic conditions associated with wasting and anæmia ½ to 1 ounce doses of the Compound Decoction improve nutrition and restore health.—B.M.J. i./06,770; C.D. i./06,533; P.J. i./06,100.

The results with Zittmann's decoction may be due to the volume of the warm fluid.—B.M.J. i./06,960.

SCAMMONIÆ RADIX. (*Off.*)

Dried root of *Convolvulus Scammonia* (*Convolvulaceæ*).

Scammonium. (*Off.*) **U.S.**

Dose.—5 to 10 grains. Emulsifies with water.

The gum resin exuding from the living root on incision, hence known as Virgin Scammony.

Scammoniæ Resina. (*Off.*) **U.S.**

Dose.—3 to 8 grains (0·2 to 0·52 Gm.). Prepared by exhausting the root with Alcohol 90% and pouring the concentrated tincture into water in a thin stream. Occurs in greenish lumps. Soluble almost entirely in

Alcohol and Ether. **Scammonin** is this substance purified (*see p.* 454).

Uses.—Purgative in obstinate constipation. Produces copious watery evacuation in a few hours. Does not act until reaching the duodenum.

Pilula Scammonii Composita. (*Off.*)

Dose.—4 to 8 grains (0·26 to 0·52 Gm.).

Scammony Resin 1, Jalap Resin 1, Curd Soap 1, Tincture of Ginger, 3.

Pulvis Scammonii Compositus. (*Off.*)

Dose.—10 to 20 grains (0·65 to 1·3 Gm.).

Scammony Resin 4, Jalap 3, Ginger 1.

Panis Purgans, P. Belg. Scammony Resin 0·25 Gm., Pasta Panis *q.s.* for 1 dose.

SENNA (*Off.*) U.S.

The dried leaflets of either *Cassia acutifolia* (Alexandrian) or *Cassia angustifolia* (N.O. *Leguminosæ*) (East Indian or Tinnevelly). The activity of the drug is due to Cathartic Acid. Other constituents are Emodin, Chrysophanic Acid and Gluco-sennin. In addition, the legumes or fruits of both these varieties are in use for making infusions. These are stronger than the leaves.—Tschirch P.J. ii./05,250. **P. Austr.** especially refers to *Fructus* (*Folliculi*) of Alexandrian Senna.

Confectio Sennæ (*Off.*). — *Syn.* LENITIVE ELECTUARY. *Dose.*—60 to 120 grains (4 to 8 Gm.).

Senna 7, Coriander 3, Figs 12, Tamarind 9, Casias Pulp 9, Prunes 6, Extract of Liquorice 1, Sugar 30, Water *q.s.*

Oil of Coriander in place of the powdered fruit gives a non-gritty confection; does not keep well. Adjust to consistency rather than to the weight.—C.D. i./05,708.

U.S. has Senna 10, Cassia 16, Tamarind 10, Prune 7, Fig 12, Sugar 55·5, Oil of Coriander 0·5, Water *q.s.* to 100.

Confectio Sennæ cum Jalapa.—St. M.'s H. Jalap 10, Senna 15, Ginger 2, Treacle 60.

Elixir Sennæ, B.P.C.

Dose.—1 to 3 drachms (3·5 to 10·5 Cc.).

Moisten Alexandrian Senna 16 ounces, with 4 ounces of rectified spirit mixed with 12 ounces of water, pack tightly in a closed vessel, macerate for 3 days, and press. Repeat with

sufficient of the same menstruum to give, in all, 16 ounces of liquor. Add this to sugar 12 ounces, and heat in a closed vessel to 200° F. After ten minutes, cool, strain, and add, previously mixed, Chloroform 24 minims, Oil of Coriander 2½ minims, Tincture of Capsicum ½ drachm, Rectified Spirit 3 drachms, adding proof spirit, if necessary, *q.s.* to 24 ounces.

In this preparation the Cathartic Acid, a glucoside contained in senna, not being subjected to long exposure to heat, is preserved from oxidation; **Cathartic Acid** is sometimes prescribed in doses of 4 to 8 grains in pills, but is unstable.

Fluidextractum Sennæ. U.S. 1=1. By alcoholic percolation. *Average dose.*—30 minims.

A strong alcoholic percolate is first made to remove the griping resinous matter—and rejected. Diluted alcohol is then used after drying. It produces a good preparation therapeutically.—Caspari. As also the Elixir above.—W.W.W.

Extractum Sennæ Leguminorum Liquidum, B.P.C. *Dose.*—1 to 2 drachms.

Senna Pods 16 ounces, bruised, are repeatedly macerated with a mixture of Alcohol 90% 6 ounces, and Water 12 ounces, pressing after each maceration, heating to 93° C. 10 minutes, and making up volume if necessary to 16 ounces.

Elixir Sennæ Leguminorum may be prepared, as Elixir Sennæ, B.P.C., using legumes instead of leaves.

Infusum Sennæ (*Off.*). *Dose.*—½ to 2 ounces. Senna 2 ounces, Ginger 55 grains, Boiling Water 1 pint. A grain of Potassium Nitrate to the ounce will preserve it.

Tinctura Sennæ Composita (*Off.*).

Dose.—½ to 1 drachm repeated; 2 to 4 drachms for a single dose. Senna 8, Raisins 4, Caraway Fruit 1, Coriander Fruit 1, Alcohol 45% 40. By maceration.

Tinctura Sennæ Leguminorum. The same strength as above, using legumes in place of leaves.

Pulvis Glycyrrhizæ Composita contains 1 in 6.

Mistura Sennæ Composita.—*Syn.* Black Draught (*Off.*).

Dose.—1 to 2 ounces (30 to 60 Cc.).

Magnesium Sulphate 5, Liquid Extract of Liquorice 1, Compound Tincture of Cardamoms 2, Aromatic Spirit of Ammonia 1, Infusion of Senna, *q.s.* to 20.

Syrupus Sennæ (*Off.*).

Dose.—½ to 2 drachms (1·8 to 7 Cc.).

Is prepared by three macerations with 20% alcohol, concentrating and heating to 180° F. for a few minutes,

then filtering and adding to 40 ounces of the liquid extract thus made 1 = 1, 50 ounces of Sugar and Oil of Coriander 10 minims, dissolved in 40 minims of Alcohol 90%. U.S. has Fluidextract 50, Coriander Oil 1, Syrup to 200.

Syrupus Sennæ cum Manna. SYRUPUS SENNÆ COMPOSITUS. **P. Austr.**

Dose for Infants.—½ to 1 drachm (1·8 to 35 Cc.).

Tinnevelly Senna, cut, 10, Bruised Star Anise 1, macerate 12 hours in cold Water 100; in strained liquor 10, dissolve Sugar 15, Manna 2. Boil to a Syrup.

Garfield Tea. An American specialty, contains Senna.

SINAPIS.

Mustard.

The dried ripe seeds of *Brassica nigra* (*Semen Sinapis*, P.G. iv., P. Austr. and U.S.) and *B. alba* (*Semen Erucæ*, P.G. iv., *Sinapis Nigra*, U.S.—*Cruciferæ*), powdered and mixed. The condiment sold as mustard consists of this mixture from which most of the oil has been expressed, and the cortical portion of the black seed has been removed. Black mustard contains the glucoside Sinigrin, which is—

Potassium Myronate = $C_{10}H_{18}KNS_2O_{10}$ = 412·31 (415·454 I. Wts.)

with Myrosin, which is similar to the ferment Emulsin in Bitter Almonds. This glucoside splits up under the influence of water with evolution of Allyl-iso-sulphocyanate,

$$\begin{matrix} C_3H_5 \\ | \\ NCS. \end{matrix} = 98·40 \ (99·14 \text{ I. Wts.}),$$

the principal constituent of the Essential Oil (*v. infra*). The white seeds contain a glucoside termed Sinalbin,

$C_{30}H_{44}N_2S_2O_{16}$ = 746·90 (752·552 I. Wts.),

which also splits up under the influence of water and Myrosin with evolution of an oil, White Mustard Oil,

$$C_6H_4 \begin{cases} OH \\ CH_2.\ NCS\ (1:4) \end{cases} = 163\ 92 \ (165·156 \text{ I. Wts.}),$$

which, however, cannot be distilled with water. As the black seeds contain an excess of their glucoside and the white an excess of the ferment, the combination of the two produces the strongest effect.

Uses.—In cases of poisoning a tablespoonful in half-a-pint of warm water is an emetic. In small doses is a stomachic and appetiser. Externally a counter irritant when applied as a poultice, or added to hot water and used as a foot bath. It may blister tender skins.

The percentage of oil is 0·3 to 0·86. Dutch Seeds are best.—P. J. ii./04,475.

Examination of Mustard Seed, Detection of Myrosin, and Sinigrin.—P. J. i./05,719.

Charta Sinapis (*Off.*).

Black and white mustard seeds in equal quantities are bruised and exhausted of fixed oil by means of benzol, the residue dried and powdered, and of this 5 parts are mixed with 18 volumes of **Liquor Caoutchouc** (*Off.*) (*q.v.*) spread on cartridge-paper and dried by exposure. In preparing this paper, the oil being removed, renders the glucoside capable of being more readily attacked by the ferment. **Charta Sinapizata, Ph. Ned.**, is similar.

Charta Sinapis, U.S., is made with Black Seed only.

Linimentum Sinapis (*Off.*).

Camphor 3, Alcohol (90%) 43, dissolve and add Volatile Oil of Mustard 2, Castor Oil 7.

Oleum Sinapis Expressum. Is used as a rubefacient.

Oleum Sinapis Volatile (*Off.*) **U.S.**

Average dose.—$\frac{1}{8}$ minim (U.S.).

The oil distilled from black mustard seeds after maceration with water consists principally of Allyl-iso-sulpho-cyanate, *v.p.* 650. U.S. requires a content of 92% of this substance. ***Soluble*** about 1 in 50 of water—readily in ether and alcohol.

Spiritus Sinapis, P.G. iv. Oil (volatile) 1 to Alcohol (90%) 49.

Thiosinamin.—*Syn.* RHODALLIN, ALLYL-THIO-UREA, ALLYL-SULPHO-CARBAMIDE.

$CS\langle^{NH.C_3H_5}_{NH_2}$ = 115·34 (116·204 I. Wts.).

Formed by warming oil of mustard with alcoholic solution of ammonia. Soluble in water 1 in 18, alcohol about 1 in 2, and ether. Solution 10 to 15% in dilute glycerin.

Uses.—Hypodermically for lupus and uterine affections. Preferred to alcoholic solutions which cause pain.

Its application by subcutaneous injection softens scar tissue when a 10% solution is used; strictures of the gullet have been much relieved by this treatment.—B.M.J.E. i./04,75; i./05,63.

Has also been given internally in dose of ½ grain (0·03 Gm.), increased to 1½ grain (0·1 Gm.) in alcoholic solution (Merck). Should be used with caution.—P.J. 1892,342; L.i./93,1083; B.M.J.E. i./93,47. For keloid —L. i./97,1106; Y.B. 1898, 363,467; B.M.J. i./03,656; L.i./03,785.

Hypertrophy of pylorus with stenosis successfully treated by 10 to 15 minim doses of 10% alcoholic solution.—B.M.J. i./06,379.

Thiosinamin Plaster Mulls, 10, 20, and 30 Gm. per ⅕ sq. m., and Thiosinamin Salve Soap, **Sapo Thiosinamin**, 10 and 15% (Unna) are prepared.

Perigastric adhesions caused by pyloric obstructions, and in cicatricial stenosis of the pylorus are relieved, and in hour-glass stomach. In scleroderma.—B.M.J.ii./05,1362.

Adhesive parametritis treated by hypodermic injections of 3 grains daily into the median line of the vault of the vagina. Results satisfactory. Firm bands, however, do not yield to it.—Muench. Med. Woch., Sept. 12, 05.

Relieves traumatic stricture of the parotid duct.—B.M.J.E. i./06,71.

Fibrolysin, a modification of Thiosinamin, consisting of a double salt of thiosinamin and sodium salicylate, hence more soluble in water. Capsules are supplied.

Dose.—40 minims (2·4 Cc.).

SODIUM.

Na = 22·88 (23·05 I. Wts.).

A soft white metal decomposing water. Is prevented from oxidisation by keeping under mineral naphtha.

Is employed in making Liquor Sodii Ethylatis (*q.v.*).

Uses of Sodium Salts.—These are much less depressing to the heart, muscles and nervous system than are the corresponding Salts of Potassium, hence the Bromide, Iodide and Chlorate of Sodium are preferred as medicines.

Sodii Acetas. (*Off.*) **U.S.**

$CH_3COONa,3H_2O$ = 135·10 (B.P. and U.S. Wts.); (136·122 I. Wts.). *Average dose.*—15 grains.

Colourless crystals or white powder. Soluble in water about 1 in 1 with alkaline reaction, and about 1 in 35 in alcohol 90%. Is rarely used medicinally. According to U.S. should contain in uneffloresced condition 99·5% pure Sodium Acetate as formula.

Sodii Chloridum. (*Off.*)

NaCl = 58·07 (58·50 I. Wts.).

Dose.—10 to 60 grains (0·65 to 4·0 Gm.)

White cubical crystals.

Soluble 1 in $2\frac{3}{4}$ of water (not more in boiling water) very slightly in Alcohol 90% (about 1 in 200). It produces neither rise in temperature on dissolving (exothermic), nor diminution (endothermic),—it is therefore equally soluble in either hot or cold water.

Uses.—Although in common use is not requisite to those having ordinary mixed diet, but is necessary to vegetarians. Given in excess leads to scurvy, while a want of sufficient salt in the food leads to anæmia, debility and œdema of face and ankles. Large doses are emetic and may relax the bowels. Rectal injections are used to kill threadworms. Hypodermically or into the veins as saline solution for the coma of diabetes.

Saline Solution, Normal. PHYSIOLOGICAL SALT SOLUTION. This is intended to be isatonic with the blood corpuscles and possesses the same osmotic pressure as the liquid of the liquor sanguinis. The proportion has been calculated at 0·6% for frogs; for man a solution of sodium chloride 0·9%, or roughly 80 grains to the pint of boiled water, is generally used for intravenous injection in hæmorrhage, uterine flooding, or collapse. The solution should be at a temperature of about 105° F., and injected into any convenient vein, at the rate of about a pint in ten minutes, or into the rectum; particularly useful in the hæmorrhage of typhoid.

Serum **Factitium**, P. Belg., is 0·8%.

Sodium Chloride produces œdema in cases of nephritis, while during a milk diet (without Sodium Chloride) the œdema disappears.—L. ii./03,61.

Another formula:—Sodium Chloride 1 drachm, Sodium Acetate 1 drachm in Sterile Water 1 pint. Injected in puerperal eclampsia in the areolar tissue beneath the breast, and after delivery into the lax.

abdominal wall. The object of the method is to cause the kidneys to act.—B.M.J. ii./05,1634.

Artificial or Inorganic Serum of Trunecek for nervous ailments and high arterial tension.—B.M.J. ii./02,149. *Dose.*—Subcutaneously 1 Cc. to commence with, increasing by 0·2 Cc. May also be given by rectum and mouth.

Sodium Sulphate 44, Sodium Chloride 492, Sodium Phosphate 15, Sodium Carbonate 21, Potassium Sulphate 40, water *q.s.* to make 10,000.

Tablets of Trunecek's Serum are now prepared 5 grains each (Martindale), *i.e.*, equivalent approximately to 5 Cc. of the serum. Administration *per os* is equally effective.—Wien. Klin. Rundschau, July 23 and 30,1905.

For atheroma and sclerosis of arterial coats.—B.M.J.E.ii./04,43.

For a large number of artificial sera under inventors' names consult F.N. 1906,253.

Sodium Chloride Shells.—Xylonite Boxes containing 1 drachm of Sterile Salt for 1 pint of Normal Saline Solution are convenient for the operating bag.

Use in Glaucoma—Has good influence over the development of calcification of the arteries, probably by reason of the solubility of calcium phosphate in sodium chloride solution at certain strength.—Oph., May 1906, 302.

Subcutaneous injection of sea water in senile debility.—B.M.J.E. i./06,28.

A diminution in diuresis is effected by a corresponding increase in the percentage of chlorides. The retention of fluids in the body is not likely to be favourable in disease, and is distinctly unfavourable in cardiac disease.—B.M.J.E. i./06,24.

Hayem's Solution. Sodium Chloride 5, Sodium Sulphate 10, Water 1,000. Sterilise. **Chéron's Solution.** Sodium Chloride 2, Sodium Sulphate 8, Sodium Phosphate 4, Phenol 1, Sterile Water 100. *Dose* intravenously 5 to 10 Cc. **Iodized Serum, De Renzi.** Sodium Chloride 6, Iodine 1, Potassium Iodide 3, Sterile Water 1,000. *Dose* in surgical tuberculosis 200 to 300 Cc. per diem.—Y.B.P., 02,251.

This must be distinguished from Hayem's Blood Examination Fluid, *vide p.* 834.

References to Injections of Saline Solution.

In uræmia and puerperal eclampsia. Also tends to recovery from poisoning by carbolic acid, morphine and alcohol; and further in sciatica after hæmatemesis, and for collapse.—B.M.J. i./02,770. For gastric ulcer given by enemata. Vomiting, recurrent of infants, normal saline per rectum or subcutaneously.—B.M.J. i./05,350.

In pneumonia, give liquids freely. Normal salt solution is very useful.—Amer. Med., Aug. 26,05.

Relapsing fever and a case of severe osteomyelitis well treated by injections. The sedative effect of duboisine, hyoscine, and bromides is increased by giving 400 Cc. of normal saline.—M. A. 1904,21.

Normal saline during and after abdominal section combats shock and lessens thirst.—M.A. 1904,96.

Delirium tremens, best treatment.—B.M.J.E.ii./05,20.

Tetanus, three cases recovered by intravenous injections of sodium chloride.—L.ii./04,831.

In cholera, injections subcutaneous and intravenous, 30 cases, good results.—L. i./06,1468.

In pneumonia and other fevers with advantage.—M. Arch., 1906,90.

In ascites due to tubercular peritonitis, and in pleurisy with effusion, dechlorination (food without salt) gave good results.—Pr. lxxiii., 629.

Baths of Common Salt (or Tidman's Sea Salt), about 2 pounds to each bath, act as a tonic and stimulant, and are useful for chronic rheumatism.

'Solubes' Sodium Chloride, 15 grains each, are useful for producing extemporaneously 5 ounces of a normal saline solution for surgical use.

Tubes of Saline Solution, Sterilised, contain in saturated solution sufficient for two pints, hermetically sealed. Best for post-partum hæmorrhage; are convenient for carrying in the surgical bag.—L. i./99,35; ii./00,1866.

Cerebos Salt.

Sodium Chloride with 4% of phosphates, mostly Calcium Phosphate; less deliquescent than 'Salt.' Is intended to replace the phosphates removed in the preparation of food.

Digestive Salt.—*Syn.* PEPSALIA.

This consists of Sodium Chloride and Pepsin.

Pulvis Sodii Chloridi Compositus.

Potassium Chlorate 1, Alum 1, Boric Acid Powder 1 Sodium Chloride 6, Sodium Biborate 6.

A 'saltspoonful' in a half a tumbler or more of warm water as a gargle is very beneficial for inflamed conditions of the throat.

Sodii Bromidum. (*Off.*)

NaBr = 102·23(103·01 I. Wts.).

Dose.—5 to 30 grains (0·32 to 2 Gm.).

Tablets, 5 grains (0·32 Gm.). *Dose.*—1 to 6.

In slightly deliquescent granular white crystals, tasting like common salt; soluble 8 in 9 of water. The anhydrous salt only should be used medicinally, it can be crystallized containing 26% of water. U.S. requires 97% pure. Sodium Bromide is preferable to potassium bromide from its weaker action on the heart.

A mixture of bromides in the proportion of potassium bromide 2, sodium bromide 2, and ammonium bromide 1, is said to have a better action than either salt alone.

Gowers suggests small regular dosage of sodium bromide, *e.g.*, with food, as substitute for the salt in the 'saltless' treatment of epilepsy. (*See also* Sodium Phosphate.) The theory is that diminishing the chloride increases the readiness with which bromide enters the nerve elements.

A course of sodium bromide the best means of overcoming morphine habit. Initial dose 30, increased to 100 or 120 grains at intervals of 12 hours. Effects noticed about sixth day, when morphine, which has been gradually lessened each day, should be discontinued.—Th. Gaz. 1890,599.

Maniacal attacks warded off by drachm doses combined with hyoscine injections.—B.M.J. i./03,74.

Sal Bromatum Effervescens.—*Arzn.*

Dose.—60 to 120 grains (4 to 8 Gm.).

Potassium Bromide 400, Sodium Bromide 400, Ammonium Bromide 200, Sodium Bicarbonate 1000, Citric Acid 380, Tartaric Acid 445, Sugar 175, all in powder, separately dried and sifted. Mix in above order, and moisten with Absolute Alcohol 300; sift the mass quickly through a coarse sieve and dry at 104° F.

Sodii Bicarbonas (*Off.*). **U.S.**

$NaHCO_3$=83·43 (84·058 I. Wts.).

Dose.—5 to 30 grains (0·32 to 2·0 Gm.).

Occurs in small white crystals or powder. ***Soluble*** 1 in 11 of water; 20 parts are neutralised by 17 of

Citric or 18 of Tartaric Acid. Is largely employed in dyspepsia and is of value in diabetes. A little rubbed on to the gum or placed in the cavity of a tooth, stops toothache. Large doses very useful in infantile vomiting; to neutralise the acid intoxication in these cases 100 grains should be given when attack threatens.—M. A., 1904,379.

Incompatible with acids and acid salts, and with metallic and alkaloidal salts.

Nebula Alkalina, T.H. Sodium Bicarbonate 15 gr., Borax 15 gr., Carbolic Acid 4 gr., Glycerin 45 m., Water 1 ounce. *Vide* also Dobell's Solution. **C.L.T.E.** has approximately half this strength *sine* Glycerin. **Nebula Sodii Bicarbonatis, C.L.T.E.** Sodium Bicarbonate 20 gr., Glycerin 1 dr., Water to 1 oz.

Non-suppurative middle ear disease best treated by sterile solution injected with Eustachian catheter.—B.M.J.ii./04,1206.

Collutorium Alkalinum Compositum, R.D.H. Sodium Bicarbonate 15 grains, Sodium Chloride 10 grains, Sodium Salicylate 1 grain, Thymol, Menthol, ¼ grain each, Glycerin of Borax 1 drachm, Thymol Solution to 1 ounce.

Sodii Carbonas (*Off.*).

$Na_2CO_3,10H_2O = 284{\cdot}11$ (286·26 I. Wts.).

Dose.—5 to 30 grains (**0·32 to 2·0 Gm.**).

Is prepared from Sodium Chloride either by (the Solvay or Ammonia process) interaction with Ammonium Bicarbonate and subsequent ignition (Sodium Bicarbonate is an intermediate product), or by converting it into Sodium Sulphate and the action of heat on a mixture of the sulphate with Carbon and Calcium Carbonate (Leblanc process). It is soluble in less than 2 of water and effloresces in the air. **A lotion**, 2 grains to the ounce, relieves eczema.

Instruments are boiled in a solution 1% strength to prevent rusting and for sterilising.

Sodii Carbonas Exsiccatus (*Off.*).

107 of the exsiccated salt are obtained from 284 of the crystals approximately.

Sodii Carbonas Monohydratus, U.S.

Average dose.—4 grains, $Na_2CO_3 + H_2O = 123{\cdot}19$ (U.S. Wts.)

Contains not less than 85% pure Anhydrous Sodium Carbonate Na_2CO_3, corresponding to not less than 99·5% of the crystallized monohydrated salt.

Sodii Chloras, Sodium Chlorate, U.S.

$NaClO_3$=105·71 (105·7 U.S. Wts.) (106·50 I.Wts).

Dose.—10 to 30 grains (0·65 to 2 Gm.).

In large regular modified tetrahedric crystals, colourless, and has a mawkish, not disagreeable, saline taste, soluble 1 in less than 2 parts of water, and 1 in 34 of 90% alcohol. It fuses and deflagrates when exposed to a red heat. For many purposes, as for stomatitis (for which potassium chlorate is also used), this salt is to be preferred.

Tablets of Sodium Chlorate and Borax, 5 grains.

Useful in loss of voice and relaxed throat.

Trochisci Sodii Chloratis, 3 grains in each (0·2 Gm.).

Are prepared in two forms, with black currant paste, and with plain sugar. They are much more palatable than potassium chlorate lozenges, and are quite as beneficial as these in affections of the mouth and throat.

Gargarisma Chlori. *Syn.* EUCHLORINE GARGLE.

Sodium Chlorate in powder	...	...	10 grains.
Hydrochloric Acid	...	...	30 minims.

Mix in a pint bottle, and let the gas generate and replace the air in the bottle, then cork the bottle, and let it stand for two minutes; lastly add gradually shaking after each addition, Distilled Water to 1 pint.

Useful as a detergent, and to remove follicular patches. 2 or 3 ounces in a quart jug may be used as an inhalation (cold). Potassium chlorate may be used in place of the sodium salt, but the latter is less nauseous.

Is recommended in diphtheria, to be used freely as gargle and small quantities swallowed.—B.M.J. i./93,1004; L. i./95,445.

Liquor Chlori Compositus, U.S. *Average dose.*—1 drachm. Has Potassium Chlorate 5 Gm., Pure Hydrochloric Acid 18 Cc., Water to 1,000.

Gargarisma Chlori, St. Th. H. Has Potassium Chlorate 200 grains, Hydrochloric Acid 40 minims, and Water 1 pint, and is used with an equal quantity of water, or more.

Gargarisma Potassii Chloratis, St. Th. H. Has Potassium Chlorate 260 grains, Hydrochloric Acid 100 minims and Water 1 pint.

St. M.'s H. has 15 grains Potassium Chlorate to Water 1 ounce.

Liquor Sodæ Chlorinatæ (*Off.*). 2·5% Cl. U.S. 2·4%. *Dose.*—10 to 20 minims (*Off.*). Dissolve Sodium Carbonate 600, in Water 1,000. Triturate Chlorinated Lime 400, with Water 3,000. Mix and filter. (*Off.*). **U.S.** employs Monohydrated Sodium Carbonate 65, Chlorinated Lime 90, Water to 1,000. Process slightly modified.

Sodii Hypochloris is an efficient bactericide.—L.ii./96,1509.

Sodii Citras. $2C_3H_4(OH)(COONa)_3+11H_2O =$ 709·20 (*Off.* and U.S. Wts.); (714·556 I. Wts.).

Dose.—10 to 60 grains (0.65 to 4 Gm.).

Is in small granular crystals or powder.

Solubility 1 in 3 of water. Is given as a cooling saline in preference to Potassium Citrate. Useful in azoturia, for it diminishes both polyuria and the losses of urea, and recommended for diabetes.—M., 01,131; L.ii./04,433.

Sodium Citrate Tablets.—5 and 10 grains.

For infant feeding;—(1) For weaning the healthy infant; (2) for increasing the amount of milk taken in the 24 hours; (3) for correcting milk dyspepsia; (4) for the avoidance of scurvy.—B.M.J. ii./05,1021.

In the case of a child 4 months old commence with proportion of 1 grain to the ounce of milk, increase to 3 grains if necessary.

20 Cc. of 25% solution per litre of milk prevents clotting. Metabolism experiments.—L. i./06,1153.

Wright has shown that the citrates have a decalcifying effect on the blood, at first lessening coagulability, but later on continued use, this again increases, probably owing to the fact that the citrates dissolve the lime salts from the tissues.—B.M.J.i./06,126.

Combines with the calcium contained. The calcium is essential to the rennet and fibrin ferments, hence if a little blood be drawn off into a dish containing a few crystals of Sodium Citrate, the clotting of the blood will be greatly delayed.—Dixon.

Liquor Sodii Ethylatis (*Off.*).

Is prepared by dissolving Sodium 1, in Absolute Alcohol 20, keeping the latter cool by a stream of cold water; has Sp. Gr. 0·867, and contains 18% of C_2H_5ONa.

The solution is syrupy, colourless, but darkens to a

brown colour. *Uses.*—Is recommended as the most manageable and effective of all caustics. It is used to destroy nævi and other vascular growths. It should be lightly applied by means of a glass rod for 2 or 3 successive days, when a scale or scab will form. It is said to cause little or no pain. Many cases of lupus have been completely cured by this application.

Successful use in hypertrichosis, also in removing moles.

No water should be allowed to touch the part.

Glass Capsules are prepared containing 20 minims of the liquor. These are convenient in use, and the liquor is not so prone to decomposition, but even in these it turns brown.

Pasta Londinensis, London Paste, T.H.

Caustic Soda and Unslaked Lime of each equal parts, rubbed together in a warm mortar—made into paste when required for use as a caustic. It is said to be less painful than **Vienna Paste**, which is Caustic Potash 5, Slaked Lime 6 (**Pasta Potassæ cum Calce Mid. H.** has equal parts), made into a Paste with alcohol.

R.D.H. has Caustic Potash and Slaked Lime, equal parts with Glycerin *q.s.*

Soda Caustica, Sodii Hydroxidum. (*Off.*). **U.S.**

NaOH=39·76 (B.P. and U.S. Wts.) (40.058 I. Wts.).

In coarse white powder, fused masses, or moulded sticks. That of U.S. is 95% pure.

Sodium Hypobromite Solution.

Caustic Soda 100 Gm., Distilled Water 250 Cc. Dissolve, cool, and keep iced while adding *guttatim*. Bromine 25 Cc.

Mix and dissolve. This solution is used to estimate the amount of urea in a given quantity of urine. On adding the solution, nitrogen is evolved from the urea, and is measured in a **Doremus Tube**, in which each graduation represents 1 per cent. of urea in the urine, or by the ureometer of **Squibb's** pattern, the number of Cc. displaces an equivalent volume of water, and by tables this amount gives the equivalent.

Vide also Urea Estimation, *p.* 851.

It is better to keep the bromine separate; it is therefore supplied in tubes containing 1, 2·2, and 4 Cc. respectively; 1 Cc. of bromine should be added to 11 Cc. of the solution as required. In place of these,

Liquor Bromi—Bromine 1 Cc., Potassium Bromide 1·5 Gm., Distilled Water *q.s.* to 11 Cc. (=1 in 11) may be used in equal quantity to the soda solution.

Sodii Iodidum (*Off.*). U.S.

NaI = 148·78 *Off.* and U.S. Wts. (150·02 I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

A dry, white crystalline deliquescent powder, ***soluble*** 3 in 2 of water and 1 in 3 of alcohol 90%. Is required officially to be nearly 99% pure, and must be distinguished from the hydrous salt containing $2\,H_2O$, which crystallises from cold solutions.

This salt is probably preferable to the potassium one in actinomycosis.—L. ii./04,1204,1225.

Sodii Nitras. *Dose.*—15 grains. U.S. requires 99% pure. $NaNO_3$ = 84·45 (U.S. Wts.).

Saline, Refrigerant, Diuretic.

Sodii Nitris, Sodium Nitrite (*Off.*).

$NaNO_2$ = 68·58 (69·09 I. Wts.).

Dose.—1 to 2 grains (0·065 to 0·13 Gm.).

Is obtained by reduction of Sodium Nitrate by fusing it with lead in small pieces.

In white, deliquescent, crystalline granules, or in sticks, with a cooling saline taste, soluble 2 in 3 of water; useful in angina pectoris and in epileptiform convulsions. In these has an action similar to nitrite of amyl.

Compressed Tablets, 2½ grains each, are prepared.

For asthma 3 to 5 grains frequently repeated; specially useful with hyoscyamus.—L. i./90,240.

Can well replace the less stable nitrites, most useful in angina and irregular heart action.—Pr. lii.357.

Even ⅛ grain distinctly affects the circulation, yet large doses do not cause death.—D. J. Leech.

Sodii Phosphas Neutralis. *Syn.* TRIBASIC SODIUM PHOSPHATE.

$$O{=}P\left.\begin{matrix}\diagup ONa\\ -ONa\\ \diagdown ONa\end{matrix}\right\} + 12H_2O = 377{\cdot}52\ (380{\cdot}342\ \text{I. Wts.}).$$

Large quantities of this salt are used for softening water and for boilers, preventing the incrustations.

This salt dissolves in water with marked alkaline reaction, produced by dissociation of Sodium Hydrate.

Sodii Phosphas (*Off.*), U.S. **P. Austr.** *Syn.* HYDROGEN DI-SODIC PHOSPHATE; TASTELESS PURGING SALT.

Na_2HPO_4, $12H_2O$ = 355·64 (355·61 U.S. Wts.) (358·30 I. Wts.).

Dose.—¼ to ½ ounce (7 to 15 Gm.) or 30 to 120 grains (2 to 8 Gm.) repeated, may be given in soup.

Soluble 1 in 6 of water, is very efflorescent, loses 63% of its weight when heated to dull redness. Has an alkaline reaction.

Sodium phosphate is mildly aperient, well suited for a delicate stomach; in small doses it is antacid and diuretic, useful in bilious sick-headache and jaundice.

For hepatic calculi, 60 grains 3 times a day, recommended with $\frac{1}{20}$ grain sodium arsenate added, if any evidences of gastric intestinal catarrh are present.

In a diabetic, sodium phosphate *per os* and injected, reduced the urine and glucose.—B.M.J. i./03,1205.

Subcutaneous injection (of 2 grains) recommended in nervous affections.—B.M.J.E. ii./92,80. Cure of locomotor ataxy.—L. ii./93,1246; doubts thrown upon the case, 1422, 1550. Another case.—L. ii./93,1352.

Has been suggested to take the place of the Chloride with food in the 'saltless' treatment of epilepsy. *See also* Sodii Bromidum.

Sodii Phosphas Effervescens (Martindale).

Dose.—1 to 3 drachms (4 to 12 Gm.).

A convenient and pleasant mode of taking this useful purgative. Introduced by W. M., and made Official.

'Vescettes' of Sodium Phosphate.

Each containing 30 grains. To be crushed and taken in a draught of warm water.

Sodii Phosphas Exsiccatus, U.S. Contains not less than 99% Na_2HPO_4 = 141·08 (141·05 U.S. Wts.), (142·108 I. Wts.).

Dose.—10 grains to 4 drachms (0·65 to 16 Gm.) in some warm liquid.

Liquor Sodii Phosphatis Compositus, U.S.

Average dose.—2 fluidrachms (8 Cc.). Contains Sodium Phosphate 1,000, Sodium Nitrate 40, Citric Acid 130, in Water to 1,000. **Melachol**, a proprietary sold in U.S., is similar.

Sodii et Ammonii Phosphas. *Syn*. MICROCOSMIC SALT. $Na(NH_4)HPO_4 + 4H_2O = 207{\cdot}66$ (209·194 I. Wts.). In chemical analysis with the blowpipe.

Sodii Phosphas Acidus. **Dihydrogen Sodium Phosphate.** $NaH_2PO_4 + H_2O = 137{\cdot}08$ (138·082 I. Wts.). *Dose*.—30 to 60 grains (2 to 4 Gm.).

Crystals soluble about 1 in 1 of water, and 1 in 300 of alcohol 90%. Has been given in alkalinity of urine with good results. Particularly useful in cystitis, and after operations on the bladder to keep the urine acid. If diarrhœa occurs, the administration should be stopped for a short time. A solution of 2 drachms of the salt to a pint of water may also be ordered to drink from time to time.—L. i./03,662; B.M.J. i./03,1256.

In enuresis where urine is alkaline (due to fixed alkalis and not to any inflammatory septic condition).—M.A. 1906, 203. Carcinoma freed from neighbouring structures by the administration of Sodium Acid Phosphate and Hydrochloric Acid.—B.M.J. ii./05,1646.

Sodii Pyrophosphas, U.S.

$Na_4P_2O_7 + 10H_2O = (443{\cdot}02$ U.S. Wts.).

Average dose.—30 grains (2 Gm.). Colourless transparent crystals, with cooling saline and feebly alkaline taste. Has cathartic properties.

Sodium Silicate, Solution of.

$Na_2SiO_3 = 122{\cdot}50(+ Aq.)$ I. Wts.

Syn. SOLUBLE GLASS, Water Glass.

A viscid solution, of the consistence of treacle, usually containing 10% of caustic soda and 20% of silica. Sodium Silicate solution has a remarkable power in arresting the putrefaction of organic matter.

Potassium Silicate, Solution of. Variable amounts of $K_2SiO_3 = 154{\cdot}70$ (I. Wts.) and $SiO_2 = 60{\cdot}4$ (I. Wts.). *Syn*. SOLUBLE GLASS, Water Glass.

Is less viscid than the last. Both preparations have been employed to impregnate bandages for treating fractures and other surgical cases, in place of starch; but the potassium solution, if nearly neutral, is preferred.

This was the original preparation. Soda was substituted in its manufacture. In erysipelas, painted over the affected part with success. Has been used diluted with from 4 to 11 parts of water; must be neutral.

Salufer. A mixture of Silicofluorides used in the moist treatment of wounds. There is no fear of absorption attending its use.—B.M.J.i./03,712.

Sodii Persulphas, Sodium Persulphate.

$Na_2S_2O_8$=236·44 (238·22 I. Wts.).

Dose.—1 to 3 grains in water before meals.

In small white granular crystals, soluble in water. Recommended in France for tuberculosis because it stimulates the appetite. Similarly for chlorotic and neuropathic subjects. Useful in hyper-acid dyspepsia at the onset, also in gastric cancer. This, in common with the otuer persulphates, is a strong oxidising agent.

Ammonium and Potassium Persulphates, $K_2S_2O_8$=268·34 (270·42 I. Wts.), (the latter known as **Anthion**), are used in Photography.

On adding Barium Chloride to a Solution of Potassium Persulphate there is no precipitation. But on warming decomposition occurs and Barium Sulphate is thrown down.

The Ammonium Salt $(NH_4)_2S_2O_8$=226·56 (228·264 I.Wts. is stable at 100° C. but in the moist condition, readily yields ozonized oxygen, liberates iodine from potassium iodide, converts uric acid into guanine, &c., oxidizes hæmatin in ammoniacal solution.

To sterilise sponges a solution is employed containing Ammonium Persulphate 37 Gm., Distilled Water 950 Cc. Dissolve and then add Hydrochloric Acid 11 Cc. This solution in four days or so is strongly germicidal, and will kill anthrax spores in less than one minute. The solution does not stain, contains no sediment. Also suitable as a hand disinfectant. It bleaches.—L. ii./05,1106.

Lithium Persulphate. $Li_2S_2O_8$=204·62 (206·18 I. Wts.). *Dose.*—1 to 3 grains. Is suggested for use in gout and rheumatism.

Quantitative estimation of persulphates by means of Potassium Iodide.—Y.B.P., 1901, 97.

Sodii Sulphas Acidus. $NaHSO_4+H_2O$=137·10 (138.134 I. Wts.). *Syn.* Sodium Bisulphate.

In crystals or in fused masses, is recommended to purify water which may have typhoid contamination; 15 grains to a pint of water destroys *B. typhosus* after 15 minutes contact, as also *B. enteritidis, Spirillum choleræ* and internal parasitic worms.—Na., Aug.31,05, 432.

The innocuousness of the method has been shown by a human being drinking daily for two months several glasses of water treated with it.

Tablets, for disinfection of water, containing the

equivalent of 7½ grains of active Sodium Bisulphate are prepared to dissolve in ½ pint of water.

They are effervescent and yield a slightly acid drink. Refreshing and thirst quenching in hot weather and hot climates.

They should also be used for the wash water of Salads (in tropical countries these are fertilised by fresh manure which may often be infected), and for fresh fish, such as oysters.

These Tablets have been used in the South African and in the Russo-Japanese wars with success.

Sodii Sulphas. (*Off.*)

$Na_2SO_4.10H_2O$ = 319·90 (322·32 I. Wts.).

Dose.—¼ to ½ ounce, or 10 to 120 grains repeated.

Transparent efflorescent crystals with bitter taste, soluble about 1 in 3 of water—also in Glycerin; insoluble in Alcohol.

Sodii Sulphas Exsiccatus. Natrium Sulphuricum Siccum, P.G. iv.

$Na_2SO_4.H_2O$ = 158·98 (160·176 I. Wts.).

Dose.—½ to 2 drachms (2 to 8 Gm.).

On drying, sodium sulphate (Glauber's salt) loses about one-half its weight, leaving the anhydrous salt.

Sodii Sulphas Effervescens (Martindale).

Dose.—A teaspoonful or more in half a tumbler of water, taken half an hour before breakfast; it produces as a rule *one* efficient evacuation.

An agreeable and palatable aperient introduced by W. M., containing about half its weight of dried sodium sulphate; stimulates both the liver and bowel without causing depression. Its action resembles that of Carlsbad Water. It is suitable for travellers, portable, non-deliquescent, stable, and keeps well in the tropics.

Sodii Sulphas Effervescens (*Off.*). Is similar.

Sodio - Magnesii Sulphas Effervescens. (Martindale.)

Dose.—A teaspoonful or more in half a tumbler of water, taken half an hour before breakfast.

An agreeable and efficient aperient introduced by the writer. The Sulphates of Sodium and Magnesium combined resemble Hunyadi Janos and Pullna waters; also Friedrichshall, if a little common salt be added to each dose. This preparation is palatable, stable in composition, and convenient to use when travelling.

'Vescettes' of Sodio-Magnesium Sulphate. Each equivalent to 60 grains of the above, to be crushed and dissolved in a small draught of warm water.

Sodium and Magnesium Sulphates are useful in clearing out the intestinal tract and lower the blood-pressure (in arterio-sclerosis).—B.M.J. i./06,126.

Sodio-Magnesii Sulphas Effervescens cum Caffeina (Martindale).

Dose.—One teaspoonful or more.

A useful "pick-me-up," and for headaches.

'Vescettes' of this preparation contain 60 grains.

Chloro-Sodio-Magnesian Aperient.

Dose.—A teaspoonful or more.

An efficient saline purge, useful in migraine and other forms of headache; also in constipation, and for assisting digestion and relieving depression by increasing the action of the liver, intestines, and kidneys, and promoting free excretion of waste products.

The activity and palatability of the last five preparations may be increased, especially in winter, if taken in warm water. The combination of the salts of sodium and magnesium makes a more active purgative but the effervescent sodium sulphate alone is more pleasant to take.

Sal Carolinum. True Carlsbad Salt.

Dose.—1 to 2 drachms. This is imitated by:—

Sal Carolinum Factitium, P.G. P. Jap., Ph. Ned. **Artificial Carlsbad Salt.**

Dose.—20 to 60 grains (1·3 to 4 Gm.) in warm water.

Dried Sodium Sulphate 44, Potassium Sulphate 2, Sodium Chloride 18, Sodium Bicarbonate 36, all in fine powder. Mix. 53 grains to 1 pint of water is similar to Carlsbad Water. **Marienbad Salt** is a similar aperient.

'Vescettes' of Carlsbad Salts. Each equivalent to 2 ounces of Carlsbad-Sprudel Water.

Pulvis Salis Carolini Factitii Effervescens, B.P.C. *Dose.*—60 to 120 grains.

Exsiccated Sodium Sulphate 11 ounces, Potassium Sulphate ½ ounce, Sodium Chloride 4½ ounces, Sodium Bicarbonate 54 ounces, Tartaric Acid 40 ounces, Glusidé 28 grains. Dry separately and mix.

Sal Emsanum Facticium, Ph. Ned.

Sodium Sulphate Exsiccated 7, Potassium Sulphate 13, Sodium Chloride 325, Sodium Bicarbonate 655.

Sal Hunyadi Janos Facticium, Ph. Ned.
Desiccate Magnesium Sulphate 950 to 500, add Sodium Chloride 50, and Sodium Sulphate Desiccated 450.

Sal Vichy Facticium, Ph. Ned.
Desiccate Sodium Phosphate 40 to 16, add Potassium Sulphate 50, Sodium Chloride 80, Sodium Bicarbonate 854.

Sal Wildungense Facticium; Ph. Ned.
Sodium Sulphate Desiccated 5, Potassium Sulphate 10, Calcium Carbonate 240, Magnesium Carbonate 240, Sodium Bicarbonate 225, Sodium Chloride 280.

Sodii Sulphis. (*Off.*) U.S.
$Na_2SO_3,7H_2O = 250{\cdot}38$ (250·39 U.S.; 252·272 I. Wts.)
Dose.—5 to 20 grains (0·32 to 1·3 Gm.).
Colourless crystals which effloresce in the air (keep in stoppered bottles).
Soluble in water 3 in 4, also in Glycerin 1 in 25; sparingly soluble in Alcohol 90%. Incompatible with acids. Antiseptic.

Sodii Sulphidum, $Na_2S,9H_2O = 238{\cdot}5$ (240·304 I. Wts.). Yellowish deliquescent crystals soluble in water. Employed in skin affections, *e.g.* in :—

Balneum Sulphuris Alkalinum, St. M.'s H.
Sodium Sulphide 2 ounces, Sodium Chloride 2 ounces, Sodium Bicarbonate 1 ounce. To be added to 50 or 60 gallons of hot water for bath.

Balneum Sulphuris Compositum, St. J. H.
Precipitated Sulphur 2 ounces, Sodium Hyposulphite 1 ounce, Dilute Sulphuric Acid ½ ounce, Water at 95° F. 30 gallons.

Soda Tartarata (*Off.*). Potassii et Sodii Tartras, U.S. Sodium Potassium Tartrate. Rochelle Salt, Seignette Salt.
$CHOH.CHOH.COONa.COOK + 4H_2O = 280{\cdot}15$ (282·296 I. Wts.).
Dose.—120 to 240 grains (8 to 16 Gm.). Colourless crystals with saline taste.
Soluble 1 in 1½ of water. Almost insoluble in Alcohol. Is a constituent of

Pulvis Sodæ Tartaratæ Effervescens (*Off.*). Seidlitz Powder.
Sodium Potassium Tartrate, in dry powder, 120 grains, Sodium Bicarbonate, in dry powder, 40 grains, in the blue paper. Tartaric Acid, in dry powder, 38 grains, in the white paper. 'Extra Strong' (3 drachms Rochelle Salt) and 'Double Strength' (4 drachms) are also supplied.

Sodii Tartras (Neutrale).

$\left.\begin{matrix}CHOH.COONa\\CHOH.COONa\end{matrix}\right\}2H_2O=228{\cdot}44$ (230·164 I. Wts.).

Dose.—As aperient ½ to 1 ounce. Diuretic, 15 to 60 grains repeated. White crystalline powder comparatively tasteless. Soluble in water. Relaxes the bowels and increases the flow of urine.

Sodii Succinas.

$C_2H_4\left\{\begin{matrix}CO.ONa.\\CO.ONa.\end{matrix}\right.+6H_2O=268{\cdot}2$ (270·228 I. Wts.).

Dose.—5 grains (0·32 Gm.) every 3 or 4 hours.

A white crystalline compound, soluble 1 in less than 1·5 of water and practically insoluble in alcohol 96%. Recommended in catarrhal icterus, the treatment being supplemented by alkaline waters.—M ,01,133.

Sodii Sulphocyanidum.

$N{\equiv}CSNa = 80{\cdot}55$ (81·15 I. Wts.).

Dose.—5 grains (0·32 Gm.).

A crystalline colourless salt, very soluble in water 1 in 0·3, and soluble 1 in 0·6 of Alcohol 90%. It has a sedative action on the nervous system, is an analgesic and may be found useful in nervous affections, arterial sclerosis, and chronic nephritis.

Sodii Sulphovinas, Sodium Sulphovinate.

$C_2H_5Na.SO_4,H_2O=164{\cdot}92$ (166·166 I. Wts.).

Syn.—Sodium Sulphethylate or Ethylsulphate.

Dose.—¼ to 1 ounce (7 to 30 Gm.) efflorescent colourless crystals; is aperient and does not cause colic.

Sodii Taurocholas, $NaC_{26}H_{44}NSO_7 = 533{\cdot}46$ (537·502 I. Wts.). **Sodium Taurocholate.**

Dose.—2 to 6 grains (0·13 to 0·4 Gm.), in pill, keratin-coated to prevent solution until it reaches the bowels. A whitish powder, prepared from pig's bile, ***soluble*** about 2 in 1 of water. It has been recommended for gouty obesity and dyspepsia. Is added to culture media for separation of *B. typhi abdom.* from *B. coli communis.*—B.M.J. i./02,1473.

Sodii Glycocholas.

$NaC_{26}H_{42}NO_6 = 483{\cdot}76$ (487·426 I. Wts.).

Dose.—2 to 6 grains (0·13 to 0·4 Gm.).

A similar salt, soluble 1 in 2 of water and 1 in 3 of alcohol 90% which appears to be a useful cholagogue

for congestion of the liver, gallstones, constipation and melancholia.

Produce slight fall of blood pressure, the taurocholate more than the glycocholate.—B.M.J. i./05,59.

Cholalic Acid. *Syn.* COLALIN. $C_{24}H_{40}O_5 = 405{\cdot}24$ (408·3 I. Wts.).

An active principle of bile in amorphous yellowish powder, non-toxic and non-irritating.

Soluble in alkalis, particularly caustic potash, and in alcohol about 1 in 1; insoluble in acids, ether, and water.

Colalin Tablets ($\frac{1}{8}$ and $\frac{1}{2}$ grain in each. *Dose.*—One three times daily before food) are supplied containing a small proportion of magnesium carbonate.

Uses.—Stimulates the liver and increases flow of bile. It converts a thick viscous bile into a normal fluid one. Has slight depressent action on heart. It is not dissolved in the stomach as it is insoluble in dilute Hydrochloric Acid, but is soluble in the alkaline juice of the small intestine. It is best administered on an empty stomach. Has given good results as a cholagogue. Suggested for biliousness, melancholia, recurrent sick-headache and intestinal indigestion.

Should the substance constipate due to the action the bile has on absorption of fats—

Colalin Laxative should be administered. Colalin combined with the anthraquinon principle of Cascara. **Tablets** contain $1\frac{1}{8}$ grain each. In this proportion, *viz.*, Colalin $\frac{1}{4}$ grain, Anthraquinone of Cascara $\frac{7}{8}$ grain.

Dose.—One thrice daily.—B.M.J. i./06,687.

Sodii Telluras, Sodium Tellurate.

$Na_2TeO_4,5H_2O = 327{\cdot}78$ I. Wts.

Dose.—$\frac{1}{3}$ to $\frac{2}{3}$ grain (0·02 to 0·04 Gm.) in pill daily. A powerful antisudorific, in phthisical and other sweating. It gives the characteristic Tellurium smell to the breath, and may cause diarrhœa if pulmonary lesions are far advanced.—B.M.J.E. i./91,110; ii./91,182 ii./96,84; Pr. lviii.336.

SPARTEINÆ SULPHAS.

$C_{15}H_{26}N_2.H_2SO_4.5H_2O = 419{\cdot}27$ (422·444 I. Wts.) (water content varies).

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.), increased,

The sulphate of a volatile liquid alkaloid $C_{15}H_{26}N_2$ = 232·53 (234·288 I. Wts.), obtained from the leaves and branches of Broom, *Cytisus scoparius* (*Genêt à Balais, Codex Supp.*). Is in colourless crystals, ***soluble*** 3 in 2 of water, and about 1 in 6 of alcohol 90%. This contains also a crystalline principle Scoparin.

Injectio Sparteinæ Hypodermica.

Contains 1 grain of the Sulphate in 6 minims.

Dose.—2 to 6 minims (0·12 to 0·35 Cc.).

Hypodermic Tablets contain ½ grain (0·032 Gm.).

Pills contain ¼ grain (0·016 Gm.).

Sparteine has been recommended as a remedy for morphine habit, *v.p.* 416.

Has a tonic action on the heart, restoring its rhythm and accelerating its beats when in a weak atonic state.

Is not cumulative; a valuable diuretic; should be tried when digitalis fails; relieves stenocardiac attacks.

Prompt in action, but inferior to digitalis in power; useful in uncompensated heart disease.—Pr. xliv.60.

Tests to distinguish Sparteine, Conine and Nicotine.—P.J. ii./05,333.

Oxysparteina, $C_{15}H_{24}N_2O$=246·41 (248·272 I.Wts.) is an oxidation product of Sparteine.

Oxysparteinæ Hydrochloridum.

$C_{15}H_{24}N_2O.HCl,4H_2O$ = 354·12(356·794 I. Wts).

Dose.—½ to 1½ grains (0·032 to 0·1 Gm.) daily.

In transparent crystals, freely soluble in water. May be given hypodermically.

A useful cardiac stimulant where there is much contraction of vessels, as it hardly affects the latter.

SPHAGNUM.

Turf-Moss, *Sphagnum, sp. var.*

This, when dried, on account of its elasticity and great capability of sucking up or imbibing liquids, forms a useful dressing for absorbing the discharge from open wounds, and especially urinary discharge in bladder, kidney, and dropsical affections. It is antiputrescent and at the same time deodorant. It is sold in compressed sheets, like cardboard, measuring 24 inches by 15 inches (for varieties *vide infra*), which absorb 20 times their weight of water, and when disintegrated, may be formed

nto pillows or pads by enclosure in muslin bags, or the compressed dressing may be placed just as it is beneath the bed sheets.

Recommended as an absorbent of pus, leaving wound clean. May be used as a padding for splints.—M.C. Feb. 1892,292; several varieties are in use, viz.—

'**Hagedorn**" for general hospital and private practice. Is largely employed as a general absorbent dressing for urine, pus, and other discharges.

These are approximately $\frac{1}{8}$ inch thick.

'**Rudolphi**," thinner and more fragile than the above. May be placed beneath the bed sheets.

'**Gauze-Covered**," ready covered with a layer of absorbent gauze.

Moss Felt, softer, woven into sheets, not compressed. Suggested as a packing for splints.

In addition, **Moss Towels** for menstruation are prepared, the material being well suited for the purpose, and **Moss Soles** for boots, which are claimed to be warm in winter and cool in summer. **Moss Accouchement Sheets**, 36 × 36 inches, and **Pillows** are prepared.

Moss (Loose) is one of the most useful absorbents for beds in the case of insane persons. It is deposited on the bedstead in place of the mattress, and the imbeciles lie direct on it in short shirts. The moss absorbs and deodorises all excrementa.

STAPHISAGRIÆ SEMINA. (*Off.*) U.S.

Average dose (U.S.).—1 grain (0·063 Gm.).

Delphina. *Syn.*—Delphinine.

$C_{22}H_{35}NO_6$=406·24 (409·32 I.Wts.).

Dose—$\frac{1}{4}$ to $\frac{1}{2}$ grain (0·016 to 0·032 Gm.) in a pill.

A white or brownish white amorphous alkaloid obtained from the seeds of *Delphinium Staphisagria* (*Ranunculaceæ*). Contain about 30% of oil. The alkaloid is almost insoluble in water; soluble in alcohol, ether, and dilute acids. It is a heart poison.

Has been given internally in doses as above, in dropsy and spasmodic asthma. Locally, an alcoholic solution or ointment, containing 2 to 8%, causes tingling

and transient redness like veratrine; useful in neuralgia, earache, and toothache.

Other components (?):—

Staphisagrine, $C_{22}H_{38}NO_4 = 388{\cdot}36$ (391·304 I. Wts.).
Delphisine, $C_{27}H_{46}N_2O_4 = 458{\cdot}97$ (462·448 I. Wts.).
Delphinoidine, $C_{46}H_{68}N_2O_7$ (?) = 754·9 (760·624 I. Wts.).

Oleum Staphisagriæ, expressed from the seeds.

One to 6 or 12 parts of perfumed olive or almond oil effectually kills pediculi of all kinds. Remove nits with a mixture of vinegar and proof spirit.

Unguentum Staphisagriæ (*Off.*).

Stavesacre Seeds, crushed, 4, Benzoated Lard 35, heat on a water-bath for 2 hours, strain and press through calico, add Yellow Beeswax 4; dissolve by heat and stir until cold.

B.S.H. has Expressed Oil 60 minims, Lard 1 ounce. For scabies and to kill lice.

Fluidextractum, U.S. 1=1 Hydro-alcoholic.

Average dose.—1 minim.

Liquor Delphinine Compound.

An etherised acetic proprietary preparation applied to hollow carious teeth to stop pain; is not given internally.

'STERULES.'

'Sterules' are glass capsules of sterile solutions for ophthalmic and general use. The sterule (ophthalmic) is inserted through an **Ejector**, and its 'breech' end is snapped off at the file mark. It is drawn further through the ejector, held horizontally, and the other end is broken off at the file mark. The 'breech' end of the ejector is now covered with the index finger, and the soft part is pressed with the thumb and second finger to release a small quantity (sufficient for one application in eye work) of a *sterile* solution. The file marks are situated ¼ inch from the ends of the 'sterule.'

For general purposes **Large 'Sterules'** are prepared containing 10 minims of solution, *e.g.*, cocaine hydrochloride 5 and 10%, *v.p.* 276.—B.M.J.ii./02,980; B. & C.D. ii./02,77; also **Hypodermic Sterules** (flask-shaped).

For list of solutions in 'Sterule' form, *see* Index.

STILLINGIA, U.S.

Average dose.—30 grains (2 Gm.).

The root of *Stillingia sylvatica* (*Euphorbiaceæ*) Queen's Root, Queen's Delight, is used medicinally i

America. Contains an alkaloid Stillingine (not to be confounded with Stillingin, *v. below*). In large doses it is emetic and cathartic, in small doses alterative, used for scrofula, syphilis, jaundice, dropsy depending on liver disease, and for piles.

Fluidextractum Stillingiæ, U.S.

Average dose.—30 minims (2 Cc.) one part = 1 of root.

Sometimes gelatinises. It is better to use a stronger alcohol than U.S. directs, *e.g.*, Alcohol 3, Water 1, or to add 10% Sugar.—Caspari.

Liquor Stillingiæ Compositus, McDade's Succus Alterans.

A remedy for syphilis, consists of fld. ext. Smilax Sarsaparilla, fld. ext. Stillingia, fld. ext. Lappa Minor (burdock), fld. ext. Phytolacca, of each 2 oz., tincture of Xanthoxylum Carolinianum (prickly ash), 1 oz.; a teaspoonful increased to a tablespoonful three times a day before meals.

Stillingin. The chocolate brown powdered extractive.

Dose.—1 to 3 grains (0·065 to 0·2 Gm.) in a pill.

STRAMONIUM.

Dried leaves and dried ripe seeds of *Datura Stramonium* (*Off.*) U.S. (*Solanaceæ*). U.S. requires not less than 0·35% mydriatic alkaloid when assayed as for belladonna.

Uses.—Action similar to belladonna, and employed for same purposes. Is a usual ingredient in cigarettes and the fumigating powders employed in asthma.

Daturina. *Dose.* — $\frac{1}{120}$ to $\frac{1}{60}$ grain (0·0005 to 0·001 Gm.), increased to $\frac{1}{10}$ or more, in solution with diluted sulphuric acid. Datura Stramonium yields this alkaloid, which is indistinguishable from Hyoscyamine (*q.v.* for formula) in its chemical and physiological properties, and is a stereo-isomer of Atropine (*v.p.* 153).

Datura Metel and *D. Arborea* contain Scopolamine.—P. J. ii./05,230,617. For further details, *v.p.* 419.

Methods of assay of Stramonium leaves,—yield about 0·3% alkaloid.—P. J. i./03,426 (0·2% B. & C. D. i./06,234).

Schmidt confirms that hyoscyamine is the only alkaloid in—P. J. ii./05,127.

Results of examination of dry extracts from seeds and leaves with different menstrua.—C. D. i./06,420.

From the seeds of *Datura fastuosa var. Flor. coerul. plen.*, which plant is said by many authorities to be identical with *D. alba*, Schmidt obtained Scopolamine 0·216%, Hyoscyamine 0·034%, and traces of Atropine. The var. *D. fastuosa flor. alb. plen.* gave slightly less of the constituents.—B. & C. D. i./05,210.

Stramonium seeds contain about 15–30% of a fixed drying

oil. The seeds and leaves have about the same alkaloidal strength—average 0·22%.—P. J. i./06,310.

Extractum Stramonii. (*Off.*)

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·06 Gm.).

An extract of the seeds in No. 40 powder prepared with Alcohol 70%. The powdered extract of Stramonium of commerce contains 1·5% alkaloids. The average yield of extract from the leaves is 20%.—Caspari.

Fluidextractum Stramonii, U.S.

Average dose. — 1 minim, 1=1, standardised to 0·35 Gm. mydriatic alkaloids in 100 Cc.

Tinctura Stramonii. (*Off.*)

Dose.—5 to 15 minims, 1 of leaves in 5 of 45% alcohol by percolation. U.S. 1 in 10 of alcohol 48·9% vol. Standardised to 0·03% mydriatic alkaloids. A standard of 0·06% alkaloid has been suggested.—P.J.i./04,6.

Mistura Antispasmodica, N.H.W. Tincture of Stramonium, Tincture of Lobelia (Ethereal), Tincture of Opium, of each 6 minims, Chloroform Water to $\frac{1}{2}$ ounce.

Mistura Asthmatica, N.H.W. Tincture of Stramonium, Tincture of Lobelia (Ethereal) of each 10 minims, Ether 15 minims, Potassium Bromide 10 grains, Chloroform Water to $\frac{1}{2}$ ounce.

Unguentum Stramonii, U.S. Extract of Stramonium Leaves 10, rubbed smooth with Diluted Alcohol 5, and Hydrous Wool Fat 20, and Benzoated Lard 65 added.

Daturinæ Sulphas.—Daturine Sulphate.

Dose.—$\frac{1}{120}$ to $\frac{1}{60}$ grain (0·0005 to 0·001 Gm.). Minute, white, granular crystals, readily soluble in water.

Guttæ Daturinæ, R.O.H. 0·5%.

Ophthalmic Discs contain $\frac{1}{5000}$ grain of Daturine Sulphate in each, combined with Gelatin.

In acute mania it acts like hyoscyamine and atropine in producing sleep.

STRONTIUM.

Sr = 87·60 I. Wts.

Strontium is probably the most inoffensive of the alkaline earth-metals. Its salts improve the appetite, assist assimilation and nutrition, and increase body weight; also said to be antiseptic to the digestive tract.

Strontium salts are innocuous, not diuretic, and check formation of albumen in epithelial and parenchymatous, but not interstitial nephritis.—L. i./92,47.

Strontii Bromidum, U.S.

$SrBr_2 + 6H_2O = 352{\cdot}94$ (U.S. Wts.); (355·616 I.Wts.)

Dose.—5 to 30 grains (0·32 to 2 Gm.).

In deliquescent crystals with bitter saline taste, ***soluble*** in less than an equal quantity of water. Used successfully in gastric affections, dyspepsia, &c.; also in epilepsy and chronic cardiac and renal diseases. Has but little toxic action.

Tablets contain each 5 grains (0.32 Gm.).

Effervescent Strontium Bromide. *Dose.*—1 drachm (contains 10 grains) or more.

'**Vescettes**' of **Strontium Bromide** are each equivalent to 60 grains of the above.

Strontii Bromidum Exsiccatum.

Dose.—4 to 24 grains (0·26 to 1·5 Gm.).

On drying Sodium Bromide it loses most of its water of crystallisation, 4 parts are about = 5 of crystals.

Valuable in acute gastric catarrh and vomiting of nervous origin.—B.M.J. ii./92,1286.

Epilepsy, good results in.—L. i./99,1089; ii./99,958.

Useful in convulsions, epilepsy, and dilated stomach; less control over epilepsy than potassium bromide, but less liable to cause acne.—L. i./95,567; ii./98,988.

Strontii Carbonas. $SrCO_3 = 147{\cdot}6$ I. Wts.

Dose.—5 to 30 grains (0·32 to 2 Gm.).

Strontii Iodidum, U.S.

$SrI_2 + 6H_2O = 446{\cdot}02$ U.S. Wts. (449·636 I. Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

In white crystalline masses, freely soluble in water.

The action of bromide and iodide of strontium in exophthalmic goitre of children beneficial.—B.M.J. ii./98,1042; and in chronic endocarditis.

Strontii Lactas, U.S. (1890).

$$\left[C_2H_4\begin{cases}OH\\COO\end{cases}\right]_2 Sr + 3H_2O = 319{\cdot}728 \text{ I. Wts.}$$

Dose.—5 to 30 grains (0·32 to 2 Gm.).

A white crystalline powder, very soluble in water.

Of great service in albuminuria and Bright's disease.

May well be combined with iron in the albuminuria of pregnancy.

Strontii Salicylas, U.S. $[C_6H_4.OH.COO]_2Sr + 2H_2O$=394·72 U.S. Wts. (397·712 I.Wts.).

Dose.—5 to 20 grains (0·32 to 1·3 Gm.) in cachet.

A white crystalline powder, slightly soluble in water and in alcohol.

Very valuable for chronic gout and lithæmia, and a good intestinal antiseptic.—B.M.J. i./95,14.

STROPHANTHUS (*Off.*). U.S.

The mature ripe seeds of *Strophanthus Kombé* (Oliver), (*Apocynaceæ*) freed from the awns, of a fawn colour, and covered with hairs. A section of the seed should give a green colour with a mixture of sulphuric acid 80 and water 20. *S. Courmontii* and several other species have been used as adulterants.

Commercial History of (Holmes).—P.J. i./06,312

Antidotes to Strophanthus preparations.

After stomach pump or emetics give Tannic or Gallic Acid in water, followed by stimulants. Anæsthetics to relieve spasm. Potassium Permanganate has been recommended.

Varieties of Strophanthus in commerce.—P.J. 1893,868,927. Pharmacognosy of, ii./00,241,265.

Strophanthus sp. have yielded two crystalline glucosides :—Strophanthin, from *S. Kombé*, which gives a green reaction with sulphuric acid, melts at 172·75° C., and breaks up into Strophanthidin, and the methyl-ether of a peculiar sugar,—and Pseudo-Strophanthin, probably from *S. hispidus* and other species which gives a red colour with sulphuric acid, melts at 179° C., yields Pseudo-Strophanthidin on hydrolysis, and is twice as active physiologically.—P.J. 1889,328 ; ii./00,314,388.

Strophanthin, U.S.

$C_{40}H_{66}O_{19}$=844·12 (850·528 I. Wts.). (U.S. gives, however, no formula.)

Dose.—$\frac{1}{300}$ to $\frac{1}{100}$ grain (0·0002 to 0·00065 Gm.) hypodermically. Is irritating at the seat of injection.

A white glucoside, or "mixture of several" (U.S.). Soluble in water and alcohol 90%, allied in its physiological action to digitalin and of bitter taste. Fuses at 170°C. (finally melting at 190°C.—U.S.).

Use.—As a cardiac tonic and diuretic.—P.J. 1890,533.

Determination of Strophanthin. — P.J. ii./05,580 ; (Mann) P.J.ii./06,93.

Especially valuable in stenosis, but unsuitable in aortic disease; pulse improves in force and rhythm.

Successful in angina pectoris; strophanthin unreliable. —L. i./89,199,304.

Strophanthus is of great value in renal insufficiency; advantage of immediate action compared with digitalis.

Strophanthus not as generally useful as digitalis, but occasionally of service where the latter has failed or is not tolerated. Useful where contraction of vessels great, as it acts less on these than on heart.—L. ii./92,277; B.M.J. ii./92,1156.

Useful in the cardiac failure of acute pneumonia following influenza.—B.M.J. i./98,1120.

Resembles digitalis in action and is employed for same purposes, especially for cardiac mitral diseases.

For alcoholism with weak heart, seven-drop doses of tincture create distaste for alcohol.—L. ii./94,211.

Summary of effects of strophanthin:—pulse regulated and strengthened, dyspnœa and palpitation lessened, urine increased (apparently due to increase of blood pressure), appetite increased, action of bowels and perspiration not affected, — non-cumulative.—B.M.J. i./90,1327; L. ii./90,414; Pr. xlv. 130.

Injectio Strophanthini Hypodermica, R.F.H.

Dose.—2 to 6 minims. Five minims = $\frac{1}{130}$ grain.

Strophanthin $\frac{1}{8}$ grain, Distilled Water 110 minims.

Extractum Strophanthi (*Off.*).

Dose.—$\frac{1}{4}$ to 1 grain (0·016 to 0·065 Gm.).

The seeds are first percolated with purified ether, and then with 90% alcohol; the alcoholic percolate concentrated and mixed with milk sugar, so that 2 parts of extract in powder = 1 part of seeds.

Tinctura Strophanthi (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

Strophanthus Seeds in No. 30 powder, 1; moisten with Alcohol (70%) *q.s.*; macerate for 48 hours, then percolate slowly to produce 20, and dilute to 40 with more alcohol. Is half the strength of the 1885 preparation. U.S. is 1 in 10 with Alcohol (94·9% Vol.) and Water in proportion of 650 and 350. 1 in 10 Alcohol (70%).—P. Austr. and Ph. Ned.

C.U.D. suggests should be 10% strength prepared by percolation with Alcohol 70%.

Experiments on removing fat from, by cooling to 14° C., and by other methods. Cooling satisfactory.—P.J. ii./99,469.

The tincture gives better results than strophanthin.—B.M.J. i./90,1327.

On administration of equal doses of this tincture and Digitalis Tincture (*Off.*), the Strophanthus is always more toxic to the heart—often nine times more.—Dixon.

Pilula Strophanthi = 2, 4 or 8 minims of Tincture, combined with milk sugar. *Dose.*—1 to 3.

Tabellæ Strophanthi, each equal to 4 minims of Tincture, combined with chocolate. *Dose.*—1 to 5.

Tablets, Compressed, are also prepared equal to 2 and 5 minims of the tincture.

Tablets, Hypodermic, of Strophanthin, $\frac{1}{500}$ grain are prepared.

Ouabaïn. $C_{30}H_{46}O_{12}$ = 593·86 (598·368 I. Wts.). A glucoside from Ouabaio wood, obtained from a *Carissa sp.* of the same natural order as strophanthus, is in colourless rectaugular lamels, slightly soluble in cold water, freely in hot, fairly soluble in moderately strong spirit, insoluble in absolute alcohol and ether, but freely soluble in glycero-alcohol. It gives a red colour with sulphuric acid and has similar physiological properties to strophanthin, but is much more toxic in action. Ouabaïn has been used for whooping-cough in doses of $\frac{1}{1000}$ to $\frac{1}{250}$ grain every three hours.—B.M.J. i./90,950; Pr. xlv. 137; L. ii./91,887. Study on its physiological action.—B.M.J.E. i./92,27.

STRYCHNINA (*Off.*), U.S.

$C_{21}H_{22}N_2O_2$ = 331·75 (334·256 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.), in solution or in pill.

The alkaloid obtained from Nux Vomica, St. Ignatius' beans (*v.p.*503), and the seeds of other species of *Strychnos*. In trimetric prismatic crystals, colourless and inodorous. It is very poisonous; it affects the spinal cord by producing convulsions resembling those of tetanus. It probably combines loosely chemically with a substance in the cells of the cord. Its absorption in the rectum is even more rapid than in the stomach, small intestine, œsophagus or colon. (Experiment on cat.—Dixon.) Should not be coloured by strong nitric acid (absence of Brucine.)

Soluble.—Slightly in water, about 1 in 6,700, about 1 in 400 of alcohol 60%, 1 in 150 of alcohol,

90%, 1 in 400 of absolute alcohol, 1 in 6 of chloroform, nearly insoluble in ether.

Strychnicine, a new alkaloid from the leaves. It is tasteless and of slight toxic power.—Y.B.P. 1903,158.

Antidotes.—Apomorphine Injection or Emetics followed by washing out the stomach with Potassium Permanganate, then give Potassium Bromide 4 drachm dose repeated in 2 drachm amounts every hour, continued if necessary. Chloral in drachm doses. Chloroform or Ether Anæsthesia. Try also Amyl Nitrite Capsules and Paraldehyde. Artificial respiration.

Calcium Permanganate 5% solution yields innocuous product with strychnine. - J.C S.A. Vol. ii., 05, 107.

Pilula Strychninæ contains

$\frac{1}{25}$, $\frac{1}{30}$, $\frac{1}{40}$, $\frac{1}{50}$, $\frac{1}{60}$, $\frac{1}{80}$ and $\frac{1}{100}$ grain.

Ferri et Strychninæ Citras, U.S.

Average dose.—2 grains in solution.

In scales varying in colour from garnet red to yellowish brown, freely soluble in cold water. It contains not more than 1% of Strychnine, and Ferric Citrate corresponding to not less than 16% Metallic Iron.

Ferri, Quininæ et Strychninæ Citras.

Dose.—3 to 6 grains (0·2 to 0·4 Gm.).

This is in scales of a greyish-golden colour like the former preparation, but in addition to 1% of Strychnine it contains about 15% of Quinine.

Strychninæ Acetas.

$C_{21}H_{22}N_2O_2.CH_3.COOH = 391{\cdot}33$ (394·288 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

In small colourless acicular crystals, soluble 1 in 44 of water, imperfectly through loss of acetic acid.

Strychninæ Arsenas.

$C_{21}H_{22}N_2O_2,H_3AsO_4,\frac{1}{2}H_2O = 481{\cdot}71$ (485·288 I.Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

In small white acicular crystals, soluble 1 in 29 of water.

Successful in phthisis by hypodermic injection of $\frac{1}{2}$% mixture with liquid vaseline. *Dose.*—4 to 15 minims daily.—L. i./89,596.

Strychninæ Hydrobromidum.

$C_{21}H_{22}N_2O_2,HBr+H_2O = 429{\cdot}98$ (433·24 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

White crystals, soluble about 1 in 70 of water; in alcohol 1 in 100.

Strychninæ Hydrochloridum (*Off.*).

$C_{21}H_{22}N_2O_2,HCl,2H_2O$ = 403·70 (406·746 I. Wts.).

Dose—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

In small trimetric prisms, soluble 1 in 35·5 of water; alcohol (90%) 1 in 73.

Liquor Strychninæ Hydrochloridi (*Off.*).

Dose.—2 to 8 minims (0·12 to 0·5 Cc.).

Strychnine Hydrochloride 1, Alcohol (90%) 25, Distilled Water *q.s.* to 100.

For **hypodermic injection**. *Dose.*—2 to 6 minims.

Incompatible with *Liquor Arsenicalis*, and with an alkaline salt such as potassium bromide often is. Acidulating the latter with hydrobromic acid will, in most cases, prevent this. Also with Potassium Iodide, for an insoluble Iodide may be thrown out.

It is unsafe to prescribe alkaline mixtures containing more than 5 minims of this solution per ounce, or crystals of Strychnine may separate. It is wiser to avoid the possible deposition by not prescribing with Sodium Bicarbonate, Sal Volatile, &c.

Haustus Strychninæ Compositus, Mid. H.

Strychnine Hydrochloride Solution 4 minims, Quinine Sulphate 1 grain, Zinc Sulphate 1 grain, Dilute Sulphuric Acid 2 minims, Water to 1 ounce.

Should prove a useful nerve stimulant.

Haustus Strychninæ et Acidi Phosphorici, St. Bart.'s H.

Solution of Strychnine Hydrochloride 15 minims, Diluted Phosphoric Acid 15 minims, Spirit of Chloroform 15 minims, Infusion of Quassia to 1 ounce. Contains $\frac{1}{30}$ grain Strychnine Hydrochloride in 1 ounce.

Strychninæ Nitras, U.S., P. Belg. *Dose.*—$\frac{1}{64}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.). U.S. *Average dose.*—$\frac{1}{64}$ grain.

$C_{21}H_{22}N_2O_2.HNO_3$ = 394·33 (U.S. Wts. 394·30), (397·304 I. Wts.).

In hard colourless needles, soluble 1 in 60 of water; in 42 at 25°C. U.S.

Sulphuric acid should not produce more than a faint yellow colour (limit of brucine).

Injectio Strychninæ Nitratis Hypodermica.

Dose.—2 to 6 minims.

Strychnine Nitrate 1 grain, Distilled Water 100 minims.

Tablets, Hypodermic, $\frac{1}{100}$, $\frac{1}{60}$, $\frac{1}{40}$, $\frac{1}{20}$ grain.

Strychninæ Phosphas Acidus.

$C_{21}H_{22}N_2O_2.H_3PO_4,2H_2O$=464·83 (468·312 I. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

In light shining crystals, soluble 1 in 31·5 of water.

Strychninæ Sulphas, U.S.

$(C_{21}H_{22}N_2O_2)_2H_2SO_4+5H_2O$ = 850·24 (856·668 I. Wts.), (850·21 U.S. Wts.).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

The neutral salt is in prismatic crystals, soluble 1 in 62 of water; in 31 at 25° C., U.S.; M.P. 200° C.

Hypodermic Injection 1 in 100. *Dose.*—1 to 4 minims.

Tablets, $\frac{1}{60}$, $\frac{1}{30}$, $\frac{1}{30}$ grain each, for adminstration *per os*.

Hypodermic Tablets $\frac{1}{100}$, $\frac{1}{60}$, $\frac{1}{30}$ and $\frac{1}{30}$ grain.

Strychninæ Sulphas Acidus.

$C_{21}H_{22}N_2O_2.H_2SO_4+2H_2O$ = 464·85 (468·364 I. Wts.). *Dose.*—$\frac{1}{60}$ to $\frac{1}{15}$ grain (0·001 to 0·004 Gm.).

In white silky acicular crystals with a slightly acid reaction, soluble 1 in 42 of water.

Strychninæ Valerianas.

A non-crystallisable salt supplied in aqueous solution equivalent to 25% of the base. *Dose.*—$\frac{1}{25}$ minim to $\frac{1}{10}$ minim (= $\frac{1}{100}$ to $\frac{1}{40}$ grain of the base). In dispensing, dilution must be carefully made, and part rejected if necessary. A useful nervine tonic, especially for hysterical patients.

Strychnine hypodermically the only treatment found capable of arresting progressive muscular atrophy. Acts more directly than by mouth.—Gowers, Diseases of the Nervous System, 2nd ed., vol. i. p.496.

In nocturnal incontinence of urine and for cardialgia and gastralgia, Strychnine preparations have been used with good results.

Chorea minor in child which had resisted all ordinary methods, cured by nitrate of strychnine:—$\frac{1}{20}$ grain in pill 3 to 5 times daily.—M.C. Jan. 1892,252.

Drink-craving in cases of alcoholism is relieved by strychnine either by mouth or hypodermically.

In beri-beri $\frac{1}{50}$ grain injected into each thigh daily.—B.M.J.ii./05,1288.

Is of immense value in obviating and controlling post-partum bleeding.—B.M.J. ii./85,913,1059; i./86,175.

Paralysis of soft palate after diphtheria in children quickly cured by hypodermic injections of $\frac{1}{32}$ to $\frac{1}{20}$ grain. —L. i./91,1060; B.M.J. i./92,1303; Pr. xlix.295.

Discussion on the hypodermic dose to relieve chloral poisoning.—L. i./94,782,840,915,1044.

Subcutaneous use of large doses for surgical shock, 15 to 20 minims of Liquor.—B.M.J. ii./99,1471; L. i./02, 1210,1357,1497.

Heart failure in diphtheria treated with antitoxin, strychnine, and oxygen.—L.i./06,97.

Immunisation of animals against strychnine—the effect of which is very much like that of the tetanus toxin—has been produced by injection of the serum of an immunised animal.—Berlin Klin. Woch., Sept. 18,1905.

SULPHONAL (*Off.*).

$$\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!C\!<\!\begin{matrix} SO_2.C_2H_5 \\ SO_2.C_2H_5 \end{matrix} = 226{\cdot}53$$ (226·55 U.S. Wts.), (228·248 I. Wts.).

Sulphonmethanum, U.S.

Syn. Dimethyl-methane-diethylsulphone. Produced by oxidation of a mixture of ethyl-mercaptan and acetone. In colourless crystals or powder, tasteless and odourless, ***soluble*** about 1 in 450 of water (in 360 at 25°C. U.S.), 1 in 50 of cold, freely in hot alcohol. Melts at 125·5° C.

Dose.—10 to 30 grains (0·65 to 2 Gm.). In cachets or suspended with mucilage. Should be finely powdered, and followed by a draught of hot fluid. Unless in solution, a dose should be given an hour before sleep is desired.

Tablets, 5 grains (0.32 Gm.). *Dose.*—1 to 6. Should be crushed and taken in warm water.

Capsules contain 5 and 10 grains.

Effervescent Sulphonal. Contains 5 grains in 1 drachm. *Dose.*—1 drachm, or more.

Haustus Sulphonal, G.H. Sulphonal 20 grains, Mucilage Mixture (*v.p.* 129) 1 ounce.

Uses.—Soporific, but is not curative of pain; does not affect digestion, pulse, or temperature, especially in nervous subjects.

Is slow in action on account of slight solubility; 30

rains may be given in solution in 1 ounce of brandy with ounces of boiling water added (=about 140° F.).

In chorea it gives good results.

Relieves spasms and cramps in fractured limbs.

Trismus neonatorum cured by enemata of 3 grains, upplemented by internal use.—L. i./91,1060.

Is not without risk if given in cases attended with onsiderable physical prostration.—L. i./92,488.

Chronic sulphonal poisoning; symptoms are disturbnces of digestion and nervous system, ischuria, oligouria, nd sometimes albuminuria.—B.M.J.E., i./93,23.—May roduce hæmatoporphyrinuria.—L. i./04,564.

Recovery after 365 grains.—L. i./04,219.

Tetronal.—*Syn.* Diethyl-methane-diethylsulphone.

$$\begin{matrix} C_2H_5 \\ C_2H_5 \end{matrix}\!\!>\!C\!<\!\!\begin{matrix} SO_2.C_2H_5 \\ SO_2.C_2H_5 \end{matrix} = 254{\cdot}35 \text{ (256·28 I. Wts.).}$$

Dose.—10 to 20 grains (**0·65 to 1·3 Gm.**). Best given in cachets, followed by a draught of hot liquid.

Tablets, 5 grains (**0·32 Gm.**). *Dose.*—1 to 4.

In shining white crystals, melting at 185° F., odourless, with a camphoraceous bitter taste. Soluble 1 in 450 of water, 1 in 15 of alcohol 90%.

Two ethyl groups replace the two methyl groups in sulphonal. This is stated to increase hypnotic effect. The replacing of only one methyl group in sulphonal by ethyl forms—

Trional—*Syn.* Diethyl-sulfone-methyl-ethyl-methane. **Trionalum, P. Austr.; Methylsulfonalum, P.G. iv., Ph. Ned., P. Belg., Sulphonethylmethanum, U.S.**

$$\begin{matrix} CH \\ C_2H_5 \end{matrix}\!\!>\!C\!<\!\!\begin{matrix} SO_2.C_2H_5 \\ SO_2.C_2H_5 \end{matrix} = 240{\cdot}44 \text{ (240·46 U.S. Wts.), (242 264 I. Wts.).}$$

Dose.—10 to 30 grains (**0·65 to 2 Gm.**), in cachets, h a large cup of hot liquid.

An oxidation product of mercaptol made by the consensation of methylethylketone with ethylmercaptan.

In minute crystals, soluble about 1 in 480 of water, l in 195 at 25°C, U.S.) in alcohol 90% about 1 in l, and in ether.

Tablets, 5 grains (**0·32 Gm.**). *Dose.*—1 to 6.

Recovery after effects of 125 grains.—L.i./03,1096.

Haustus Trional, G.H. 30 grains to Mucilage Mixture 1 ounce (*v.p.* 129).

Uses.—Has a hypnotic action intermediate between those of sulphonal and tetronal.—B.M.J. i./90,87. Useful for insane persons.

Tetronal and Trional useful in some cases where Sulphonal failed; their advantage consists in having fewer after-effects.—B.M.J.E. ii./90,22; P.J. 1890,161.

Tetronal is the best sedative, Trional more effective in sleeplessness connected with neurasthenia and organic brain disease. Both are useless in insomnia due to pain, and in morphine and cocaine habits.

Chorea cured by Trional.—B.M.J.i./02,267.

Cured case of combined alcoholic and nicotine poisoning.—L.ii./01,223.

May produce hæmatoporphyrinuria: eight cases of poisoning known.—B.M.J.E.ii./01,35.

SULPHUR.

S = 31·82 (32·06 I. Wts.).

Dose.—20 to 60 grains (1·3 to 4 Gm.) in milk or treacle, with confection of senna, or as Pulvis Glycyrrhizæ Compositus, *q.v.* *Official* are **Precipitated** and **Sublimed Sulphur**. Sublimed sulphur in fine powder, for use either internally or externally, is preferred.

Uses.—A good laxative for children, and for adults who have piles. In chronic skin affections and rheumatism. Sublimed Sulphur checks dysentery.—L.i./01,1676.

Tetanus cured by internal and external use.—B.M.J. ii./05,1160.

Sulphurous gas and nitrogen to kill rats on board ship.—L.ii./04,1735.

Sulphur Lotum, U.S., is washed with ammoniated water.

Confectio Guaiaci Composita, L.H. Chelsea Pensioner. *Dose.*—1 to 2 drachms (4 to 8 Gm.).

Guaiacum in powder 2, Sublimed Sulphur 3, Magnesium Carbonate 2, Ginger 1, Treacle, by weight, 12.

Acid Potassium Tartrate is added to some formulæ.

St. M.'s H. has Guaiacum Resin 10, Magnesium Carborate 10, Sublimed Sulphur 15, Treacle 60.

Confectio Sulphuris. (*Off.*)
Sublimed Sulphur 100, Acid Potassium Tartrate 25, Tragacanth 1, Syrup 50, Tincture of Orange 12·5, Glycerin 37·5. *Dose.*—1 to 2 drachms (4 to 8 Gm.).

Confectio Sennæ et Sulphuris, G.H.
Dose.—1 to 2 drachms (4 to 8 Gm.).
Confection of Senna 1, Confection of Sulphur 1.
St. M.'s H. has Confection 3, Sublimed Sulphur 1.

Pulvis Guaiaci Compositus (Chelsea Pensioner), St. George's H. *Dose.*—20 to 40 grains.
Guaiacum Resin, Precipitated Sulphur, Heavy Magnesium Carbonate, Gum Acacia and Potassium Carbonate, equal parts. The Confection (*p.* 684) is more used.

Tephson's Powder. *Dose.*—60 grains.
Precipitated Sulphur 2, Guaiacum Resin 1. For tonsilitis, acne, and constipation.

Tablets of Precipitated Sulphur 5 grains with Potassium Acid Tartrate 1 grain are prepared.

Trochisci Sulphuris. (*Off.*) *Dose.*—1 to 6.
Contain Precipitated Sulphur 5 grains, Acid Potassium Tartrate 1 grain, Tincture of Orange 1 minim, in each.
Continued use is beneficial in chronic diseases of alimentary canal and liver, also of skin and articulations.
Where sugar is to be avoided, may be given as

Pastillus Sulphuris Compositus, *v.p.* 370.

Unguentum Sulphuris. (*Off.*) 1 to 9 Benzoated Lard. U.S. 15%.

Unguentum Sulphuris c. Hydrargyro, U.C.H.
Sublimed Sulphur 2½ drachms, Sublimed Mercuric Sulphide 10 grains, Ammoniated Mercury 10 grains, Olive Oil 1 drachm, Lard to 1 ounce.
To this may be added, if ordered, either 2 grains of Vermilion, 10 minims of eucalyptus oil, 10 grains of Phenol, or 5 minims of creosote. Useful in scabies and allied skin diseases.

Unguentum Sulphuris Hypochloritis.
Sublimed Sulphur 12, Essential Oil of Almonds 2, Prepared Lard 84; mix, and add with quick manipulation Sulphur Chloride (Reddish Liquid) [$S_2Cl_2 = 134{\cdot}02$ *Off.* and U.S. Wts.) (135·02 I. Wts.)] 2.
Keep in a stoppered bottle; is sometimes made double

this strength, *i.e.*, with half the quantity of basis. Useful in acne, psoriasis, and scabies.

Unguentum Sulphuris Iodidi (*Off.*). S_2I_2 = 315·44 (318·06 I. Wts.).

Sulphur Iodide 4, Glycerin 4; mix in a warmed mortar, and add Benzoated Lard 92. For tinea.

Unguentum Sulphuris Camphoratum, S. M.'s H.

Precipitated Sulphur 10 grains, Carbolic Acid 15 grains, Resorcin 15 grains, Camphor 15 grains, Solution of Tar 25 minims, Benzoated Lard ½ ounce, White Soft Paraffin ½ ounce.

Sulphuretted Hydrogen Solution (*Off.*).

Is prepared by saturating Distilled Water with Hydrogen Sulphide (H_2S). To preserve, add a little Carbon Di-sulphide.

Lotio Sulphuris cum Sapone.

Precipitated Sulphur 30, Eau de Cologne 60, Glycerin 4, Soft Soap ½, Rose-water to 500.

Is recommended for acne of the face.—W.W.W.

Sulphaqua Charges and **Lacto-sulphur Bossé** are for dissolving in water to produce sulphur baths.

In skin diseases, gout, rheumatism.

Pomatum Antipsoricum, F.E. *Syn.*—Helmerich's Pomatum.

Sublimed Sulphur 10, Distilled Water 5, Almond Oil 5, Potassium Carbonate 5, Lard 35. All by weight.

TABLETS.
(Compressed.)

In the preparation of Tablets the material has first to be *granulated*, to make it flow easily from the 'hopper' and to prevent it sticking between the dies and punches of the machine; this is effected by moistening with a little alcohol or water (to which, if desired, a minute quantity of mucilage, diluted about 1 to 4, may be added), rubbing through a suitable sieve (No. 16), and drying *thoroughly* either by very slight heat, or better, by exposure to the atmospheric air if sufficiently dry at the time. The decomposition, melting points or volatility of the chemicals to be compressed must be borne in mind. Salol, Beta-Naphthol, Benzoic Acid, Sulphonal, Trional and Phenacetin should not be heated. To obviate the sticking referred to, lubrication with French Chalk (2%), or spraying with a solution of Soft Paraffin or Cacao Butter in Ether is resorted to in some instances.

For this purpose also **Theobroma Emulsion** (White and Rodwell) is used by some:—

Dissolve Hard Soap 5, in Water 25 by heat, add to melted Theobroma Oil 25, mix thoroughly, shake in Tragacanth ½, add Benzoic Acid ½, and finally water 75. For some purposes Gum Acacia 5 is preferable to the soap. Granulate in the usual way without employing heat to dry the moistened powder. As a diluent, either necessary or permissible, Cane Sugar is best with this formula. A little glucose is useful when the powder is a very dusty one.

Theobroma Ether-Alcohol Solution is also used:—Theobroma Oil 1, Ether to 6. Dissolve and add 6 of Alcohol, or less.

There are, however, other methods which are more favoured by some manufacturers. Many of the 'tips' are the results of long experience and careful experiment, and they are jealously guarded as trade secrets.

Substances already in small crystals, *e.g.*, Potassium Chlorate, Ammonium Chloride, do not require this treatment. Tablets *to dissolve like lozenges* require half their weight of a mixture of equal parts of Acacia and Tragacanth. Owing to ***Incompatibility***, Sodium Bicarbonate and Calomel, Saccharin and Rhubarb, Salol and Camphor, Salol and Thymol, Caffeine Citrate with Acetanilide and Antipyrin, Salicylic Acid and Iron Compounds, Chloral and Alkalis, Mercuric Chloride and Metals, oxidising agents, *e.g.*, Potassium Chlorate and Permanganate with Charcoal, Sulphur, Iodine or Sugar should not be compressed together.

Five or ten per cent. of (potato) starch thoroughly dried is useful to ensure rapid breaking up of the Tablet. Deliquescent compounds should be treated with Gum Acacia or Tragacanth.

Similarly, if the powder is of a very dusty nature the judicious use of a little of these gums or of glucose or 10% Gelatin Solution is an advantage. Fibrous drugs may have 5% Dextrin. Many substances if compressed too hard are liable to cause the tablet to crack—this is particularly the case with Phenacetin and Antipyrin—the least possible amount of pressure should be applied that will produce a permanent tablet.

The majority of 5-grain Tablets are made to weigh 6¼ grains with Milk Sugar.

Acetanilide. 1 grain in 1½ grains. Add 5% Potato Starch.

Acid Aceto-Salicylic (*Syn. Aspirin*). A little French Chalk may be necessary as lubricant.

Aloin as Arsenious Acid, *q.v*

Alum. Dry thoroughly to remove water of crystallisation.

Arsenious Acid. Sugar of Milk, with French Chalk as lubricant.

Balsams. Mix with 25% Magnesia and evaporate to dryness.

Bismuth Carbonate and Sub-nitrate. Make 5 up to 6¼ with Cane Sugar (some use Lactose), adding small percentage of lubricant.

Bismuth Salicylate, as Salicin.

Bismuth and Soda. Bismuth Carbonate 3, Sodium Bicarbonate 2, Lubricant *q.s.*

Caffeine, as Arsenious Acid.

Calomel. Sugar of Milk as diluent.

Cardamoms may have 5% Dextrin.

Cascara. Compress the Extract properly granulated.

Charcoal to have 25% Cane Sugar or Acacia, or Gelatin Solution with French Chalk as lubricant.

Codeine, as Arsenious Acid. *Digitalin*, as Arsenious Acid.

Dover's Powder. 2½ grains in 3 grain tablet.

Effervescent Materials may be granulated separately and mixed in the dry condition.

Ginger may have 5% Dextrin.

Gregory's Powder. Make 5 up to 6¼ with Cane Sugar, moistening with Water.

Grey Powder. Needs Sugar and Strong Mucilage.

Guaiacol. Make up with Sugar, adding Water and Lubricant *q.s.*

Ipecacuanha. Make up with Sugar and Water. Some employ 5% Dextrin.

Mercuric Biniodide (for administration *per os*) as Arsenious Acid. *Morphine*, as Arsenious Acid. *Nux Vomica Extract*, as Arsenious Acid.

Oily substances require 2 to 5% Calcined Magnesia.

Opium. Mix with Sugar or Sugar of Milk, using French Chalk as lubricant.

Pancreatin. 5 grains in 6¼ grain tablet.

Pepsin. Mix with Sugar, granulate with 60% Alcohol, and use French Chalk as lubricant *q.s.*, 5 grains in 6¼ grain tablet.

Phenacetin. Make 5 grains up to 6¼ grains with Sugar, 5% Potato Starch, and a little Glucose useful. Lubricant, *q.s.*

Phenazone. Make 5 up to 6¼ with Sugar.

Podophyllin, as Arsenious Acid.

Quinine, as Salicin. 2 grains in 2¼ grain tablet.

Saccharin with Sodium Bicarbonate, vide *Saccharin*, p. 637.

Salicin. Mix with Sugar, lubricate with French Chalk.

Salol requires 10% Potato Starch, with Sugar. 5 grs. made up to 6¼.

Soda Mint. Sodium Bicarbonate, Peppermint Oil, Acacia, *q.s.*

Sodium Salicylate. Make 5 up to 6¼ with Cane Sugar. Lubricant, French Chalk.

Strychnine as Arsenious Acid. *Sulphonal* as Salicin.

Thyroid. Contain half their weight Desiccated Thyroid Gland made up with sugar and lubricant *q.s.*

Zinc Sulphate for lotions. Remove water of crystallisation.

Tablet Triturates are made in metal or vulcanite moulds which are worked by hand, yielding 50-200 at a time, the sizes ranging between $\frac{1}{8}$ and $\frac{9}{32}$ inch in diameter and $\frac{1}{8}$ inch in depth. The active ingredient is mixed with sugar of milk

or plain sugar, the whole being massed together with a little alcohol or alcohol and water,

For Hypodermic Tablets, Sterilised Milk Sugar, or Cane Sugar, is a useful diluent. These are prepared under the strictest aseptic precautions. A little Boric Acid is useful as lubricant. Dried Neutral Sodium Sulphate, Sodium Chloride and Ammonium Chloride are also employed in some instances. Hypodermic Tablets are well made in a Tablet Triturate mould with holes $\frac{5}{32}$ in. in diameter, the plate being $\frac{1}{16}$–$\frac{1}{8}$ inch in depth.

For machinery and other details see P.J. i./02, 46,64,84,151; i./03,36 (Theobroma and Starch excipient); 42 (Cocoanut Oil excipient), 156,211 (Theobroma Emulsion), P.J. i./04,831, ii./04,244, ii./05, 283,826,838,895.

For List of Tablets in general demand, *see* Index.

Eighteen different kinds of Tablets are now official in the pharmacopœia of the German Army.—L. i./06,703. Carbolic Acid Tablets are not in the list, as they are liable to melt in hot weather.

TEREBENUM. (*Off.*). U.S.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

A mixture of dipentene and other hydrocarbons, produced by the action of sulphuric acid on oil of turpentine and distillation. Sp. Gr. 0·862 to 0·866. Should not affect the plane of polarised light. Is colourless, and has an agreeable odour resembling fresh-sawn pine wood.

Soluble about 1 in 7 alcohol 90% ; in all proportions in absolute alcohol or chloroform, largely soluble in glacial acetic acid. It is not miscible with water, but may be emulsified by mixing it with one-sixth its weight of tragacanth powder, then adding water and shaking well.

Uses.—Terebene is a powerful yet agreeable antiseptic, disinfectant, and deodoriser. The vapour is a useful sedative and antiseptic inhalation in phthisis, *e.g.*, in a respirator, and, administered at the same time in 5-minim doses; useful also in dysentery and in hay fever.

For winter cough, drops may be taken on sugar, and it may also be inhaled.

Terebene may produce albuminuria in gouty kidney disease.—L. i./95,1434; and has caused hæmaturia.—L. i./04,652.

Capsules of Terebene contain 5 and 10 minims each.

Haustus Terebeni.—Vict. Park H.

Terebene 10 minims, Mucilage of Tragacanth 1 drachm, Glycerin 1 drachm, Cinnamon Water to 1 ounce.

Pastils, Glycogelatin contain 2 minims.

Vapor Terebeni, T.H.

Terebene 40 minims, Light Magnesium Carbonate 20 grains, Distilled water to 1 ounce.

A teaspoonful in a pint of water at 140°F. for a stimulant inhalation. For medicating the antiseptic respirators, 10 drops of a mixture of equal parts, Terebene, Phenol, and Spirit of Chloroform, is often used.

Terpinum Hydratum, P.G., U.S.—*Syn.* TERPINE.

$C_6H_8(OH)_2 \begin{cases} CH_3 \\ C_3H_7 \end{cases} + H_2O = 188{\cdot}74$ (*Off.* and U.S. Wts.) (190·176 I. Wts.).

Dose.—2 to 6 grains (0·13 to 0·4 Gm.) or more, in cachets, or pills, or suspended.

Prepared by acting during cold weather upon Rectified Oil of Turpentine 4, Alcohol 80% 3, with Nitric Acid 1 in flat dishes. Crystals separate after several days, and are recrystallised from 95% Alcohol rendered slightly alkaline. Yield 12% of the oil taken.—Caspari.

A derivative of oil of turpentine in prismatic crystals, soluble in water about 1 in 250, 1 in 14 of alcohol 90%, and about 1 in 6 in oils; prescribed as Elixir Pini Terpini et Heroin (*q.v.*), lessens cough; has been used with success in bronchitis, chronic and subacute; it assists expectoration.

Lessens secretion in initial catarrh of phthisis; useful as a hæmostatic in bleeding from lungs. Is also a diuretic.

Terpinol. *Dose.*—1½ minims (0·1 Cc.) or more in pill, or gelatin capsule. An agreeably aromatic liquid, containing bodies of the composition $C_{10}H_{16} = 135{\cdot}1$ (136·128 I. Wts.) and $C_{10}H_{18}O = 152{\cdot}98$ (154·144 I. Wts.), is obtained by the action of dilute sulphuric acid on terpene. Miscible with alcohol in all proportions, but insoluble in water.

It is used for lung affections; if it disorder the stomach, it should be given with meals.

Mackey's Terpinol Fluid is a non-poisonous disinfectant.

Terpineol. *Syn.* TERPILENOL. $C_{10}H_{18}O = 152{\cdot}98$ (*Off.* and U.S. Wts.) (154·144 I. Wts.) A product of fractional distillation of Terpinol. Is used for disguising odour of Iodoform and for scent making

TEREBINTHINA CHIA, P.L.

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

An oleo-resin flowing from the incised trunk of *istacia Terebinthus;* has been used for cancer of the male generative organs. Its taste is agreeable.

Tistura Terebinthinæ Chiæ.

Contains 30 grains in 1 ounce.

Dose.—3 drachms (10·5 Cc.) daily, in divided doses, ter food—gradually increased to 9 drachms. In ncer proves of undoubted service.

'ilula Terebinthinæ Chiæ.

Chian Turpentine 3, Sublimed Sulphur 2. In grains r one pill, in grammes for fifteen: *dose*, 2 every 4 hours. ycopodium may be added to preserve their shape.

In carcinoma of neck of womb 5 minims of 20% com- ound of Chian Turpentine with Olive Oil; increased. lternate days up to 60 minims. Justifiable in inoper- ble cancer.—M.P., Oct. 19,04.

THEOBROMA.

The seeds of Cacao, *Theobroma Cacao* (*Sterculiaceæ*). hen heated and deprived of husk and membrane, ese yield **cocoa-nibs**. The nibs ground, and most of e oil pressed out, produce, when reduced to powder, e best forms of **cocoa** for use as a beverage.

Chemical and physiological examination of Cocoas, English d Foreign, and of Plasmon Cocoa.—L. i./05,316.

Many cocoas and chocolates contain added alkali.

leum Theobromatis (*Off.*). *Syn.* CACAO BUTTER.

The concrete oil of the seeds (yield about 45%). elting at 88° to 93° F., *i.e.*, below the temperature the body, is much used for suppositories. For sub- nces which lower the melting point of the oil, and for port to hot climates, it is well to add 5 to 10% yellow x or spermaceti. The final melting point must not higher than 98·6° F.

The official melting point is too high; good commercial nples melt between 80° and 86° F. and even lower.

U.S. has saponification value between 188 and 195, o an Iodine value between 33 and 38.

asta Theobromatis, Chocolate.

This is made by grinding the nibs into a paste, with

sugar and vanilla or other flavouring added; it should contain not more than 50% of sugar and about 25% of fat (*Oleum Theobromatis*), and be free from gum, added starch, or other admixture.

The author uses chocolate for the preparation of medicated **Tabellæ**. On account of its agreeable flavour and the preservative action of its fat and sugar, it forms a useful basis for administering many medicines. The solvent action of its fat renders it eminently useful for fixing **Nitroglycerin**, **Erythrol Nitrate**, **Exalgin**, **Mannitol Nitrate**, **Menthol**, and alkaloids, such as **Cocaine**, **Caffeine**, and **Apomorphine**; also for **Pepsin** and **Santonin**, preparations of **Bismuth** and **Quinine Tannate**.

Theobromina. Ph. Ned.

$C_5H_2(CH_3)_2N_4O_2 = 178{\cdot}89$ (180·224 I. Wts.). (*See also p.* 188.)

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

An organic base existing in the seeds of the above. Content about 1 to 2%. It is a white crystalline powder, sparingly soluble in water, alcohol and ether. It is allied to Caffeine, being chemically viewed as dimethyl-xanthine, and Caffeine as trimethyl-xanthine.

Tri-Sodium Phosphate has a solvent action on the alkaloid, and by its employment 2% solutions may be obtained.—P.J. ii./99,11.

Uses.—As a diuretic, relieves cardiac and renal dropsy, and in angina pectoris, 20 to 30 grain doses spread over 24 hours lessens the frequency and severity of attacks. Given in cachet and pill.

Agurin. *Syn.* THEOBROMINE SODIO SODIC ACETATE.

$C_7H_7N_4O_2Na + NaC_2H_3O_2 = 282{\cdot}23$ (284·74 I Wts).

Dose.—7½ to 15 grains (0·5 to 1·0 Gm.), up to 45 grains daily.

A deliquescent powder easily soluble 1 in 2 parts of water and about 1 in 200 of Alcohol 90%. Has been used with advantage in sciatica and neurasthenia. Is strongly diuretic in action. Not to be given with acid substances, with preparations containing sugar or solutions of gum. Must be preserved from the air.—P.J. ii./02,48; B.M.J.E. i./02,99; L. ii./02,1762. Relieves cardiac dropsy.—B.M.J.E. ii./04,88.

Theobrominæ Sodii Salicylas.—*Syn.* Diuretin. THEOBROMINUM NATRIO-SALICYLICUM, **P. Austr.** (45% Theobromine); **P.G. iv.**; **F.E., Ph. Ned.** (46·5% Theobromine).

$C_7H_7NaN_4O_2+C_6H_4(OH)COONa=359·66$ (362 356 I. Wts.). *Dose.*—5 to 15 grains (**0·32 to 1 Gm.**).

A sodio-salicylic compound containing about 50% of sodium-theobromine. A white powder, soluble 1 in 1 in water. ***Uses.*** — Is diuretic, without affecting nervous system and causing sleeplessness.—L. i./96,1132; B.M.J.E. ii./00,3. Should be avoided in cardiac degeneration, especially with albuminuria. For scarlatinal dropsy of children is a safe diuretic.

Urinary troubles coincident with paraplegia relieved. —B.M.J.E. ii./93,80. Poisonous effects followed three doses of 15 grains each.—L. ii./95,1268.

In angina pectoris it lessens the frequency of attacks. —Med. Record, Nov. 1902. **Tablets** contain 5 grains.

Iodo-theobromine.

Dose.—2 to 10 grains (**0·13 to 0·65 Gm.**).

Sodio-theobromine iodide, containing about 40% of theobromine in combination with iodide and salicylate of sodium. A white powder, soluble in water, recommended as a good diuretic and as a stimulant to cardiac systole, increasing blood-pressure. Useful in cirrhosis of liver and acute nephritis.—B.M.J. ii./94,1190.

Theophylline. DIMETHYL-XANTHINE.

$C_5H_2(CH_3)_2N_4O_2=178·89$ (180·224 I. Wts.). (*See also p.* 188.) The synthesised alkaloid is sold under the name of THEOCIN.

Dose.—3 to 6 grains (**0·2 to 0.4 Gm.**).

This alkaloid, a crystalline powder, is present in small quantities in tea and coffee, soluble "about 1 in 140" (1 in 200 by experiment) of cold water, and about 1 in 90 of Alcohol (90%). It has marked diuretic properties.

Has been found useful in heart affections attended with symptoms of congestion, and nephritis with dropsy. —B.M.J.E. ii./02,39,56; ii./04,8.

Tablets weigh 4 grains (**0·26 Gm.**).

Theophylline Sodium. *Syn.* **Theocine Sodium Acetate.** Di-methyl xanthine with Sodium Acetate.

Dose.—5 to 8 grains.

More soluble than the theophylline alone, similarly

employed. Especially for œdema and dropsy of cardiac origin; seldom causes unpleasant effects.

Uropherin.—*Syn.* **Lithium-Diuretin.**

$C_7H_7LiN_4O_2 + C_6H_4(OH)COOLi = 327{\cdot}84$ (330·316 I. Wts.). *Dose.*—5 to 15 grains (0·32 to 1 Gm.).

A white powder, soluble 1 in 5 of water. Is a compound of theobromine-lithium and lithium salicylate. A diuretic, with little action on the heart.—Am.M.S.B. 1893,1090.

THORIUM.

Th = 232·5 I. Wts.

In view of the high value of radium, some attention therapeutically has recently been paid to the radio-activity of uranium and thorium compounds.

'Uranium' is separated by ether solution into uranium, giving α rays only, and uranium X, giving β rays only—the inactive passes into the ether—or the small amount of the uranium X may be separated by means of ammonium carbonate, in which it is insoluble. It gives off only β-radiation, and there is a state of balance between the amount of uranium X losing its activity and the amount that is regenerated. Similarly thorium X has 75% of the α and all the β rays—the insoluble thorium hydroxide shows 25% of the α and no β radiation.

If a solution of thorium nitrate be precipitated with ammonia, the precipitate is comparatively inactive, but the filtrate from the hydroxide on evaporation to dryness is intensely active.

The changes may be shown diagramatically :—

Ordinary Uranium Salt with Ammonium Carbonate or Ether on Nitrate.		Ordinary Thorium Salt with Ammonia in excess.	
Insoluble. Uranium "X" (β rays only).	Soluble. Uranium (α rays only).	Soluble. Thorium "X" (gives 75% α and all β rays).	Insoluble. Thorium (gives 25% α and no β rays).

This thorium X produces a very flighty emanation (which imparts activity)—falling to half value in one

minute, *i.e.*, in two minutes it is only quarter value, in three minutes it is one-eighth value, and so on. A metal plate exposed to thorium emanation a short time only becomes active, and the activity increases first after removal, reaches maximum in one hour, and then decays at the same rate as for a long exposure; this is explained by supposing two changes to take place, the first produces no rays, the second produces rays capable of ionising the gas.

The fact that thorium compounds possess radio-activity was discovered by Schmidt in 1896. It may be remembered that Baskerville recently fractionated thorium into two distinct elements—Berzelium and Carolinium. Later research, however, by Meyer and Gumperz (Ber. 1905, 38, 817) has not confirmed this announcement.

Radio-Thorium, a new element.—Ramsay, *see* "Le Radium," Oct., 1905. Explanation of fact that the decay curve of Uranium X is not completely complementary to the recovery curve of Uranium. Uranium X is dissolved in the crystals and the total mass of Uranium in the form of a 'solid solution.'—Na., Vol. 73, No. 1885, Dec. 14, 1905, p. 160.

Thorium X separated by aid of pyridin.—Chem. News, Jan. 1, 1906.

Thorii Hydroxidum, $Th(OH)_4 = 300{\cdot}532$ (I.Wts.) of commerce is usually found to be very active—considerably more so than **Thorium Nitrate**, $Th(NO_3)_4 = 480{\cdot}66$ ($+4H_2O = 552{\cdot}724$ I.Wts.).

Thorii Nitras is manufactured from **Monazite**, occurring on the Brazilian Coasts—also found in Ceylon, South Carolina, Queensland, and Southern Nigeria. (For recent commercial information *re* Thorium—containing minerals—*vide* C.D. i./06,196.)

Soluble in water 1 in 1; in alcohol 1 in 5.

A number of organic salts of thorium have been prepared, all of which are supplied under the collective registered trade mark "Thoriac," notably the salicylate, cinnamate, orthocoumarate, oleate, lactate, sulphocarbolate, camphor-sulphonate, and quinate, and are put forward for therapeutic use. Of these the lactate and the sulphocarbolate are soluble in water, the others being insoluble or only slightly soluble compounds, suggest themselves for external employment in the form of dusting powder, pigment, or ointment.

The *use* of these salts administered by the mouth or by subcutaneous injection is at the present moment *sub judice*. It appears, however, probable that the sulphocarbolate will be found of use in intractable skin diseases. The ointment prepared from the oleate has been found of great utility, either administered alone or in connection with other substances, in old chronic psoriasis, eczema rubrum, and gouty eczema.—Drage.

Dose.—Although some of these compounds have not actually been tried therapeutically, we are of opinion that 1 to 5 grains could safely be given providing the effects be carefully watched, beginning, of course, with the smaller amount.

Thorii Camphor-Sulphonas.

$Th(C_{10}H_{15}O.SO_3)_4,9H_2O = 1319{\cdot}364$ (I.Wts.).

The camphor-sulphonic acid necessary is prepared by acting upon 152 of camphor (in solution in acetic anhydride) with 98 of sulphuric acid, producing, theoretically, 232 of camphor-sulphonic acid. This quantity requires, theoretically, 74½ of thorium hydroxide for saturation. Well defined crystals can be prepared.

Thorii Cinnamas.

$(C_6H_5-CH=CH-COO)_4Th = 820{\cdot}724$ (I. Wts.).

Thorium cinnamate is made by treating sodium cinnamate with thorium nitrate. It contains approximately 32% ThO_2. Insoluble in water.

Thorii Ortho-Coumaras.

$$\left[C_6H_4\begin{cases}OH\\CH=CH-CO{\cdot}O\end{cases}\right]_4Th = 884{\cdot}724 \text{ (I.Wts.)}$$

Prepared by double decomposition between thorium nitrate and sodium ortho-coumarate. It occurs as a fine white powder, insoluble in water.

Thorii Glycerophosphas.

Is prepared by double decomposition, and is in the form of a white powder.

Thorium phthalate and thorium camphorate are white amorphous powders. The benzene-sulphonate $Th(C_6H_5.SO_3)_4 = 820\,90$, and naphthalene α-sulphonate $Th(C_{10}H_7SO_3)_4 = 1060{\cdot}964$ (I. Wts.) are very soluble. The β-naphthol – 6 – sulphonate $Th(HO.C_{10}H_6.SO_3)_4,9H_2O = 1287{\cdot}108$ (I. Wts.) is in colourless crystals.

Thorii Lactas.

$Th[CH_3.CH(OH).COO]_4,2H_2O = 624\cdot692$ (I. Wts.).

Manufactured by interaction of the freshly precipitated hydroxide with lactic acid. It is a crystalline salt, soluble in water, but becomes basic and less soluble on keeping.

Thorii Oleas.

Thorium Hydroxide 298 will interact with approximately 1120 of oleic acid. A little ether is added to dissolve the oleic acid. The salt is at first pasty, becoming hard ultimately. It is suggested for use in the form of an ointment with paraffin basis for eczema.

Unguentum Thorii Oleatis (Drage). Contains 25% Thorium Oleate rubbed into a smooth cream with Almond Oil.

It has been applied locally in malignant disease.

Thorii Quinas.

This is prepared by treating the hydroxide (freshly precipitated) with quinic acid. Scales are easily obtained. ***Soluble*** in water 1 in 1 easily, slightly in alcohol 90%.

Thorii Salicylas. — This salt is a basic one apparently having the formula:—

$$\left\{C_6H_4<\begin{matrix}OH\\COO\end{matrix}\right\}_2 ThO = 522\cdot58 \text{ (I. Wts.)}$$

It is prepared by precipitating thorium nitrate with sodium salicylate. It contains 50% ThO_2, and is a white, insoluble powder.

Thorii Sulphocarbolas.

Syn. Thorium Para-Phenyl-Sulphonate.

$Th(C_6H_4.SO_3.OH)_4,9H_2O = 1087\cdot044$ (I. Wts.).

A well defined crystalline salt with pinkish shade of colour. Suggested as a radio-active antiseptic. Readily soluble in water, and about 1 in 3 in alcohol 90%; but from both these solutions we find that separation shortly occurs owing apparently to dissociation.

Thorii Uras.

This salt has been prepared by double decomposition of sodium biurate with thorium nitrate. The sodium biurate, $C_5H_3NaN_4O_3 = 188\cdot83$ (190·234 I.Wts.) may be made by neutralising uric acid with sodium carbonate. Yields approximately on incineration 47% ThO_2.

Solubility.—Hardly in water; very slightly in alcohol 90%.

Thorium Emanation for Inhalation.

Mr. F. Soddy suggests the employment of inhalations of Thorium emanation produced from Thorium nitrate solution by a wash-bottle inhaler, for lung diseases. It is assumed that the emanation will have a bactericidal action.

Two cases of incipient phthisis checked, and pleuritic friction disappeared by about 20 sittings of an hour each. 3½ ounces of the nitrate are carefully neutralised with ammonia in a 500 Cc. wash bottle, about ⅘ full of water, and the emanation is allowed to accumulate in the vessel before inhaling.—B.M.J.ii./03,197; i./04,654.

Thorium Pads contain a convenient amount of thorium hydroxide, and are made to fit the part affected, *e.g.*, head, spine, etc. These pads are suggested for use in the treatment of nervous diseases.

A pad worn on the head said to have been the cause of recovery from paralysis.—L. ii./04,1106.

THYMOL (*Off.*).

$C_6H_3(CH_3)(OH)C_3H_7$,1 : 3 : 4, or $C_{10}H_{13}OH = 148\ 98$ (*Off.* and U.S. Wts.) (150·112 I. Wts.).

Dose.—½ to 2 grains (0·032 to 0·13 Gm.), in pills with powdered soap and a trace of alcohol, or in oily or aqueous solution.

A crystalline substance obtained from the oils of *Thymus vulgaris*, *Monarda punctata* (*Labiatæ*) and *Carum copticum*—*Umbelliferæ* (*v.p.* XXVII.) *Oleum Thymi* is official in U.S., and assayed to contain 20% phenols. In large transparent crystals melting at 111° F., having the odour of thyme, and a burning taste.

Soluble 1 in 1,500 of water, 1 in 200 of glycerin, 1 in 8 of alcohol and glycerin, equal parts; soluble in fats and oils, and 8 in 3 of alcohol 90%, and freely soluble in ether, acetic acid, and caustic alkaline solutions. Thymol rubbed with an equal weight of Menthol forms an oily liquid (*see* Menthol); with 3 parts of Thymol and 2 Chloral Hydrate, equal parts of Thymol and Camphor, and equal parts of Thymol and Phenol, similar liquefactions take place.

Uses.—Externally a powerful anti-parasitic, also for certain stages of eczema and psoriasis (*see* Unguentum), and for burns (*see* Volckmann's solution). Internally as a vermifuge (especially for *ankylostomiasis and for nematoid worms), 10 to 30 grains, followed by a purgative. A powerful antiseptic and deodorant. May colour the urine green. The administration simultaneously with or immediately after a large dose of a solvent of thymol, *e.g.*, alcohol, should be avoided. Is frequently ordered to be inhaled (*see* Vapor).

Liquor Thymol. 1 in 800 of warm water.

This saturated aqueous solution is antiseptic and antiputrefactive. Is used as a gargle.

Mistura Oleo-Balsamica.—*Syn.* BALSAMUM VITÆ HOFFMANNI. 'Tincture of Life.'

Dose.—1 to 4 drachms in water.

Oils of Lavender, Thyme, Lemon, Nutmeg and Orange Flowers of each 4; Oil of Cloves and Cinnamon $3\frac{1}{2}$ of each; Balsam of Peru $10\frac{1}{2}$; Alcohol 90% to 1,000; allow to stand a few days, then filter.

Ph. Ned. has Lavender Oil 5, Lemon Oil 5, Nutmeg Oil (Oleum Macidis) 8, Clove Oil 8, Cinnamon Oil 5, Peruvian Balsam 9, Alcohol 90% 960.

P. Austr. has Cinnamal 1, Eugenol 2, Neroli Oil 2, Nutmeg Oil 2, Lemon Oil 4, Lavender Oil 4, Peruvian Balsam 5, Aromatic Spirit 980.

Aromatic Spirit, P. Austr., is Melissa Leaves 150, Coriander Fruit 100, Cinnamon 25, Cardamom Seeds 25, Nutmeg 25, Lemon Oil 1, Alcohol 800, to make 1,000.

Is used in Africa as a remedy for snake bites. A carminative stimulant.

Ophthalmic Discs of Thymol contain $\frac{1}{1000}$ grain (0·065 milligramme) combined with gelatin.

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* **Ankylostomiasis.**—The worm producing this disease (*Ankylostomum duodenale*) is about $\frac{1}{4}$ inch long and of a whitish colour. Its habitat is the small intestine of man, particularly that of the miner. It attaches itself to the mucous membrane, and no fewer than 1,000 of them have been obtained from one patient. The male and female worm are quite different in formation. The eggs produced by the female pass away from the patient—and as many as 8,000,000 have been delivered by a sufferer in a single day—and the small thread worm escapes from the egg. Mines afford an excellent hatching place for the young larvæ. The miners have only themselves to blame in the matter. Hygienic and sanitary measures are alone necessary to stamp out the scourge.

A note on Ankylostomiasis.—L. i./06,1216.

Probably not a blood sucker. The anæmia it produces is probably due to toxins with a hæmolytic action.—L. i./06.1623.

Pasta Thymol cum Hydrargyri Perchlorido, R.D.H. Thymol 4, Mercuric Chloride 1, Glycerin of Tragacanth *q.s.* to form a paste.

Pastillus Thymol is prepared, containing $\frac{1}{32}$ of a grain (0·002 Gm.), *v.p.* 370.

Pigmentum Thymol.

Thymol 1, Ether 10, and Spirit 5, or Thymol 1, Petroleum Oil 18; used as pigments in ringworm of the scalp, whilst acting as parasiticides they dissolve the fat, loosen the hairs, and thus help epilation. A 2½ to 5% solution in a mixture of chloroform and olive oil also useful.

Spiritus Thymol.

Dose, 3 to 15 minims (0·18 to 0·9 Cc.).

Thymol 1, Alcohol (90%) to 10; for medicating the wool of antiseptic respirators.

In scabies, where the infection is limited and recent, a 10% solution in alcohol; this is suitable for short periods.

Thymaglycine. *Dose, per os.*—1 to 2 drachms.

Sodium Benzoate 3, Glycerin 10, Thymol Water 50, Water to 100, Liquor Cocci *q.s.*

This preparation is beneficial in rhinitis, pharyngitis, quinsy, gastric and intestinal catarrh.

For **spraying** into the throat and nostrils, may be diluted 1 to 3 with water.

For **vaginal irrigation** may be diluted with twenty times its volume or less of water.

As a **mouth wash** may be used undiluted with a brush for the gums.

Glycothymoline. A proprietary article employed in catarrhal conditions of the mucous membrane of the nose, throat, stomach, intestine, uterus and vagina.

Thymolin. Under this name a mixture of Naphthaline 18, Camphor 1, and Thymol 1 is sold.

Volckmann's Thymol Solution.

Thymol 1, Alcohol 20, Glycerin 20. Dissolve and add to Water 1,000. Used as a spray and antiseptic lotion, as for burns.

Unguentum Thymol.

L.H. has 20 grains to the ounce of Soft Paraffin.

It is important that the Thymol should be dissolved

in the basis by the aid of heat, as particles of undissolved Thymol produce great irritation; 10 grains dissolved in an ounce of Soft Paraffin applied to the skin keeps off gnats, mosquitoes, &c.

Useful in the later stages of eczema, and for psoriasis, and in skin affections of fungoid nature.

Thymol Gauze, 5%.

Thymol Wool, absorbent, 5%, 1lb. rolls, are used as antiseptic dressings.

Vapor Thymol, T.H.

Thymol 6 grains, Alcohol 90% 1 drachm, Light Magnesium Carbonate 3 grains, Water to 1 ounce. A teaspoonful to a pint of water at 140° F. for inhalation; useful in pharyngitis and laryngitis when associated with exanthemata, and in whooping cough. Stimulant and antiseptic.

Thymol Carbonate.—*Syn.* Thymotal.

Dose.—5 to 15 grains (0·32 to 1 Gm.).

A nearly tasteless, colourless, crystalline powder. Is not dissolved by the stomach and therefore proves valuable as a remedy for the intestinal worm, named *Ankylostomum duodenale*, common in Italy. May prove useful in obstinate cases of tænia and other intestinal worms.

Tablets contain 10 grains.

TINCTURÆ.

Two processes are prescribed for making tinctures :—

(i.) **Percolation.**—The drugs in a suitable state of comminution are moistened with the menstruum, and, after twenty-four hours, percolated with more of the same, until about three-fourths of the required quantity is obtained. The marc is pressed, the expressed liquid filtered, and added to the percolate. The volume of tincture is then made up to the prescribed quantity by adding menstruum *q.s.*

(ii.) **Maceration.**—The drugs are agitated frequently with the whole of the menstruum, in a closed vessel, during seven days, the liquid strained, the marc pressed, the product mixed with the strained liquid, and the whole filtered, if necessary, without further addition of liquid.

Non-Alcoholic Tinctures.—*Syn.* GLYCERIN TINCTURES, AQUEOUS TINCTURES.

Under this name aqueous extractives of certain vegetable drugs preserved by the aid of glycerin are prepared, and are used in Temperance Hospitals; they must not be substituted for the official alcoholic tinctures. Resinous drugs are not suitable for making aqueous tinctures, but the following are in some slight demand:—**Tincture, Non-Alcoholic, of Orange, Belladonna, Camphor Compound** (?), **Cinchona, Cinchona Compound, Cardamom Compound, Gentian Compound, Lavender Compound, Nux Vomica, Opium, Rhubarb Compound, Squills, and Senega.**

Ethereal Tinctures, *v.pp.* 83, 174, 215, 440, 476.

For the **dispensing of resinous tinctures**, *e.g.*, Tinctura Asafœtidæ, Benzoini Simplex, Cannabis Indicæ, Cubebæ, Guaiaci Ammoniata, Quininæ Ammoniata, and Sumbul in mixtures, **Mucilage of Acacia*** yields a more satisfactory mixture than Tragacanth except in the case of Tinct. Benzoini Co., Jalapæ, Myrrhæ, and Tolu. The Mucilage of Acacia is best diluted with as much water as possible and the tincture then added.

If **Salts** be present in the mixture the above rule applies, except in the case of Cannabis, where Tragacanth Mucilage should be used. Tinctura Podophylli requires no suspending agent in the absence of salts, but if any be present Mucilage of Acacia is best used.

Tragacanth Mucilage answers well for suspending Tinct. Jalapæ and Myrrhæ, but is useless for Tinctura Benzoini Co., Quininæ and Tolu. For Tinct. Benzoini Co. and Tinct. Tolu the two mucilages combined are best. In the case of a mixture containing 1 drachm of resinous tincture to the ounce, dilute 1 drachm of Mucilage of

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* Gum Acacia from *A. Senegal* and other species (*Leguminosæ*) 4, washed in water to remove any adherent dust, dissolved in Water 6. This quantity measures about 8¾.

Incompatible with Acacia are Alcohol, mineral acids, Borax, Ferric Salts, most Lead Salts. Bismuth Carbonate should not be suspended with Acacia Mucilage. Tragacanth answers better.

Mucilago Acaciæ, U.S., contains Acacia 34, Lime Water 33, Water to 100. The alkali is a useful addition. **Syrupus Acaciæ, U.S.**, Acacia 10, Sugar 80. Water to 100.

Acacia with as much water as possible, add the tincture, and lastly add the Mucilage of Tragacanth.

Tinctura Hydrastis, which in absence of salts requires no suspending agent, should have an addition of Mucilage of Tragacanth if salts be present in the mixture.

Tinctura Lupuli and Tinctura Cimicifugæ require no addition either in presence or absence of salts.—P.J. i./03,706.

TRAGACANTHA (*Off.*). U.S.

Dose.—2 to 10 grains (0·13 to 0·65 Gm.) or more.

From *Astragalus gummifer* and some other species (*Leguminosæ*), known in commerce as Syrian Tragacanth.

To detect acacia in tragacanth.—P.J.ii./04,453.

Gelanthum (Unna's Jelly).

Heat in a steam bath Tragacanth 110 grains, Gum Acacia 30 grains, Gelatin 120 grains, and Distilled Water 10 ounces, for 4 hours; press the paste through muslin, mix well and add Glycerin 6 drachms, heat again in a water bath for an hour, and add Distilled Water (containing in solution Thymol ¼ grain) *q.s.* to 12 ounces.—Phar. Formulas. Used as a basis for various antiseptics and combinations for skin medication.

Glycerinum Tragacanthæ (*Off.*).

Tragacanth, in powder 1, Glycerin 3. Mix, and add Water 1. Is a useful pill excipient, *v.p.* 560.

Glucantha, G.H. Pill excipient.

Tragacanth 240 grains, Water 240 minims, Syrup of Glucose 2 (fluid) ounces.

Linimentum Exsiccans. *Syn.* **Bassorin Paste.**

Tragacanth 5, Glycerin 2, Alcohol (90%) 10, Water to 100. In the alcohol contained in a wide-mouthed bottle diffuse the tragacanth, and add the water, then add quickly the glycerin, diluted with as much water, and shake well. Alcohol is necessary to keep the preparation. Quickly dries on skin, producing pleasant cooling sensation. May be medicated with any drug.

Bassorin, St. J. H.

No. 1 ('Bassorin') Tragacanth 5, Glycerin 2, Water 93. No. 2 contains Boric Acid 10%; No. 3, Salicylic Acid 5%; No. 4, Chrysarobin 5%; No. 5, Hydronaphthol 5%; No. 6, Ichthyol 30%; No. 7, Resorcin 30%; No. 8, Precipitated Sulphur 30%; and No. 9, Thioresorcin 5%.

Mucilago Tragacanthæ (*Off.*).

Dose.—1 drachm to 1 ounce (3·5 to 30 Cc.) or more.

Improved formula suggested by the writer;—

Alcohol (90%) 20 minims. Put in a 20-ounce dry bottle and add Tragacanth, in powder, 60 grains. Shake till evenly moistened and add Distilled Water *q.s.* to 10 ounces. Shake again quickly to make a uniform mucilage. This keeps much better than mucilage of acacia. One part to 3 of aqueous fluid will suspend heavy powders. *Vide* also p. 702 for resinous tinctures.

Mucilago Traganthæ, U.S.

Mix Glycerin 18 Gm. with water 75 Cc. in a tared vessel, heat to boiling, add Tragacanth 6 Gm., and macerate 24 hours with occasional stirring. Dilute to 100 Gm. Beat until uniform and strain through muslin.

A mixture of mucilage of Tragacanth and mucilage of Acacia is less viscid than one would expect from the consistence of the two separately.—P.J. ii./05,133.

Pulvis Tragacanthæ Compositus (*Off.*).

Tragacanth 1, Gum Acacia 1, Starch 1, Sugar 3.

Dose.—20 to 60 grains (1·3 to 4 Gm.). Is used as last preparation, 10 grains to 1 oz., specially useful for bismuth oxynitrate.

TRITICUM, U.S.

Couch Grass. *Syn.* **Agropyrum I.C. Add.**

Average dose.—120 grains (U.S.).

The rhizome or underground stems of *Agropyrum repens* (*Graminaceæ*), Dog-grass or Quitch. Contains gummy and saccharine demulcent principles. Is diuretic and emollient; used in bladder and kidney affections and in gonorrhœa.

Decoctum Tritici. 1 to produce 20.

Dose.—2 to 8 ounces (60 to 240 Cc.).

Fluidextractum Tritici, U.S. 1 = 1 Hydro-alcoholic. *Average dose.*—2 drachms.

Instead of the percolation with boiling water (U.S.), Caspari says repeated hot infusion and concentration is equally good.

Extractum Agropyri Liquidum, I.C. Add.

Dose.—1 to 2 drachms (3·5 to 21 Cc.).

Triticum, cut small 20; digest 3 successive times in Boiling Water 120. Evaporate the infusions to 15, add Alcohol (90%) 5, mix, and set aside for 24 hours. Then filter, and add to the filtrate Alcohol (90%) *q.s.* to produce 20.

TRITURATIONS, U.S.

General Directions.—Take of the substance 1, Milk Sugar 9. Mix equal quantities first and triturate together, adding more milk sugar from time to time, until the whole is added, and an impalpable powder is produced. By thus triturating, insoluble powders, such as Arsenious Acid, are rendered more easily and probably completely assimilated, and further, the apportionment of minute doses is more accurately effected. Triturates may be dispensed with other ingredients in either pills or powders or flavoured and coloured with Pulvis Rosæ Compositus, *v.p.* 517. The only official Triturate is Trituratio Elaterini 1 in 10 U.S. The representative of this in B.P. is Pulvis Elaterini Compositus 1 in 40. The following list may be kept prepared 1 in 10 (10%):—

Trituratio Acidi Arseniosi ...	...	$\frac{1}{6}$	to $\frac{2}{3}$	gr.
Trituratio Antimonii Tartarati	...	$\frac{1}{3}$	,, 20	,,
Trituratio Atropinæ Sulphatis	...	$\frac{1}{20}$	,, 1	,,
Trituratio Cocainæ Hydrochloratis	...	$\frac{1}{2}$	,, 5	,,
Trituratio Elaterini ...	...	$\frac{1}{4}$	,, 1	,,
Pulvis Elaterini Compositus, B.P. 1 in 40		1	,, 4	,,
Trituratio Ergotininæ Citratis	...	$\frac{1}{15}$	,, 3	,,
Trituratio Ferri Arsenatis ...	...	$\frac{5}{8}$	,, $2\frac{1}{2}$	,,
Trituratio Gelseminæ Hydrochloratis	...	$\frac{1}{6}$	,, $\frac{1}{2}$	,,
Trituratio Hydrargyri cum Creta	...	10	,, 50	,,
Trituratio Hydrargyri Perchloridi	...	$\frac{5}{16}$	,, $\frac{5}{8}$	,,
Trituratio Hydrargyri Subchloridi	...	5	,, 50	,,
Trituratio Morphinæ Hydrochloridi	...	1	,, 3	,,
Trituratio Picrotoxini ...	...	$\frac{1}{10}$	,, $\frac{2}{5}$	,,
Trituratio Sodii Arsenatis ...	...	$\frac{1}{4}$	,, 1	,,
Trituratio Strophanthi (1 grain = 10 minims Tinct.)...	...	$\frac{1}{2}$	,, $1\frac{1}{2}$	,,
Trituratio Strychninæ Hydrochloridi	...	$\frac{1}{6}$	,, $\frac{2}{3}$	,,
Trituratio Strychninæ Nitratis	...	$\frac{1}{6}$	,, $\frac{2}{3}$	,,
Trituratio Strychninæ Sulphatis	...	$\frac{1}{6}$	,, $\frac{2}{3}$	,,

The more active medicines are diluted 1 in 50 (2%), and are termed **Levigations** (Levigationes). They are as follows:—

Levigatio Aconitinæ ...	...	$\frac{1}{5}$	to $\frac{5}{6}$	gr.
Levigatio Digitalinæ Crystallisatæ	...	$\frac{1}{5}$	,, $\frac{5}{6}$	,,
Levigatio Digitalini Puri ...	...	1	,, 2	,,
Levigatio Hyoscinæ Hydrobromatis	...	$\frac{1}{4}$	,, $\frac{1}{2}$	,,
Levigatio Hyoscyaminæ ...	...	$\frac{1}{2}$	,, 1	,,
Levigatio Potassii Cantharidatis	...	$\frac{1}{8}$	,, $\frac{1}{4}$	,,

TROCHISCI.

Lozenges are officially prepared with five different flavourings. Those with **Fruit Basis** are prepared with Black Currant paste 56¾, Sugar 439½, Gum Acacia 19½, Mucilage 35½, Water *q.s.*, but are harder than the Fruit Lozenges of commerce—viz., Benzoic Acid (½ grain), Tannic Acid (½ grain), Eucalyptus Gum (1 grain), Guaiacum Resin (3 grains), Ipecacuanha (¼ grain), Extract of Krameria (1 grain), and Extract of Krameria (1 grain) combined with Cocaine Hydrochloride (Gr. $\frac{1}{20}$).

Simple Basis.—Sugar 496, Gum Acacia 19½, Mucilage 35½, Water *q.s.* Used in—Catechu (1 grain), Reduced Iron (1 grain), and Santonin (1 grain).

Rose Basis is as above, but with 17½ of mucilage, and contains Rose Water to mass. Used in—Compound Bismuth (Carbonate 2 grains), Potassium Chlorate (3 grains), and Sodium Bicarbonate (3 grains).

Tolu Basis contains Tolu Tincture 10½, Water 10½, Sugar 482, Gum Acacia 19½, Mucilage 35½, Water *q.s.* Used in Phenol (Carbolic Acid) (1 grain), Morphine (Hydrochloride $\frac{1}{36}$ grain), and Morphine Hydrochloride ($\frac{1}{36}$ grain), with Ipecacuanha ($\frac{1}{12}$ grain).

Orange (Tincture) is used to flavour Sulphur Lozenges (5 grains).

In the index those with 'R' have Rose basis; 'S' have Simple Sugar basis; 'T' have Tolu basis; 'G' have Gelatin basis, and are the commonly sold **Pastils** or **Jujubes** of oval or round shape (the latter are frequently "sugared"). *Vide* also **Pastilli Glycogelatin.**

UNGUENTA.

The principal official **Ointment Bases** are:—**Lard**, **Benzoated Lard**, and **Lard** with **Oleic Acid** (for Alkaloids); **Paraffin** Soft (White or Yellow), and Hard Paraffin, and their combination **Paraffin Ointment** (White or Yellow); and **Wool Fat** (Hydrous).

In addition, combinations of **Almond Oil**, **Beeswax** (Yellow and White), **Camphor**, **Glycerin**, **Oleic Oil**, **Spermaceti**, and **Prepared Suet** are ordered.

Unguentum Simplex (B.P. 1885) was composed of White Wax 2, Benzoated Lard 3, Almond Oil 3. For that of **Ph. Ned.**, *v.p.* 441.

Ointments may be classified according to their uses :—

1. Non-absorbent, protective, epidermatic, *e.g.*, Hard and Soft Paraffin.
2. Emollient, absorbent, endermatic, *e.g.*, Lard and Olive Oil.
3. Systematic, absorptive, diadermatic, *e.g.*, Wool Fat.—L. i./05,513.

URANII NITRAS (*Off.*).

$[UO_2](NO_3)_2 + 6H_2O = 502{\cdot}676$ I. Wts.

Dose.—$\frac{1}{2}$ to 5 grains (0·032 to 0·32 Gm.).

Is in large lemon-yellow slightly efflorescent prismatic crystals. It is soluble in half its weight of water, and has an astringent styptic taste. Its solution, 10 grains to an ounce, is used as a throat spray, and internally it has been given with good effect in diabetes in dose of 1 to 5 grains. It must be given with caution.

Uranium is a constituent of **Pitchblende** (*v.p.* 611) to the extent of 40 to 70%. **Carnolite** from Colorado is a Potassium-Uranium-Vanadate.

Determination of, in ores.—Chem. News, Oct. 21,04, *p.* 199. For further details of Uranium, *v.pp.* 611, 694.

Tablets, 1 grain (0·065 Gm.) or more. *Dose.*—1 to 5.

Uranii et Quininæ Chloridum.

Dose.—3 to 6 grains (0·2 to 0·4 Gm.) thrice daily.

In yellow minute granular crystals, soluble 1 in about 100 of water.

This salt and the nitrate are useful in diabetes, in doses of 1 to 2 grains, freely diluted, after food; do not disturb digestion or cause intestinal irritation.—B.M.J. ii./95,467.

To be tried as a cure for cancer and for gout.—L. i./03,476,1126.

Uranii Salicylas.

Dose.—5 to 20 grains (0·32 to 1·3 Gm.).

In reddish powder. Has been employed in cancer of the breast and found to improve local condition and general health. Better tolerated than the Nitrate.—L. i./05,387.

UREA.

$CO<^{NH_2}_{NH_2}$ or CH_4N_2O = 59·67 (60·112 I. Wts.)

Syn. CARBAMIDE.

Dose.—10 to 60 grains (0·65 to 4·0 Gm.) thrice daily, may be given in a mixture flavoured with lemon syrup. Hypodermically similar amount in sterile water.

The full dose is "practically an addition of ½% of artificial Urea to the normal quantity circulating in the blood."—Harper.

Colourless crystals, ***soluble*** 1 in 1 of water and in alcohol 90% about 1 in 7½.

In medicine the synthetic product is used (made by acting on Phenyl Carbonate [$CO(O.C_6H_5)_2$ = 212·47 (214·08 I. Wts.)] with Ammonia, the products of the reaction being Urea and Phenol. (Phenyl Carbonate is made by passing Phosgene, *i.e.*, Carbonyl Chloride into dilute Sodium Phenate solution.) Wöhler in the year 1828 succeeded in converting Ammonium Cyanate into Urea; it was the first animal product made by a purely chemical synthesis.

Uses.—Was first used as an antiperiodic and febrifuge in cases of ague. It was subsequently employed as a diuretic in chronic gout and kidney disease, and has been highly recommended in phthisis.

The cases most suitable for its use are: those of tuberculous pleurisy, laryngitis, peritonitis, lupus vulgaris, hydrocephalous children, tabes mesenterica, and enlarged tuberculous glands.

In the knowledge of the authors an open tuberculous wound of the knee, from which a woman had suffered for many years, healed up completely after a brief course of urea internally.

A 3% solution when added to a culture medium proved fatal to *B. tuberculosis*.—B.M.J. ii./02,397.

A python, the animal above all others possessing a plethora of urea, however, died of tuberculosis.—B.M.J. i./05,449.

For the estimation of urea in urine, *see p.* 851.

Veronal.—*Syn.* DIETHYL-MALONYL-UREA. DIETHYL BARBITURIC ACID. *Syn.* MALONAL.

$(C_2H_5)_2>C<^{CO.HN}_{CO.HN}>CO$ or $C_8H_{12}N_2O_3$ = 182·80 (184·176 I. Wts.).

Dose.—7 to 15 grains (0·46 to 1 Gm.).

Manufactured by condensing Urea with the Diethyl ster of Malonic Acid. A white crystalline powder melting at 191°C, ***soluble*** 1 in 145 water at 20°C., and about 1 in 9 of alcohol 90%, more soluble in hot water, and is also recommended to be given in hot tea. Soluble also with ease in Ether, Acetone and Acetic Ether. A saturated solution acidified with Nitric Acid gives a white gelatinous precipitate with Millon's Reagent, soluble in excess.—P.J. ii./04,548.

This test is important from a forensic point of view. A method of extraction and recognition in urine is given in Archiv. d. Pharmacie, 1904,***242***,6. The compound has a soporific action indicated in nervous restlessness, insomnia and depression, for maniacs and in cardiac troubles. Does not affect temperature or respiration. May cause erythema.—B.M.J.i./06,496; B.M.J.E.ii./03, 51,59; Pr. lxx.453; B.M.J. i./04,538; B.M.J.E. i./04,7,44; ii./04,28,36,96; L. i./06,1191. Produces sleep without subsequent depression.—Cushny, 192. Poisonous symptoms, recoveries.—L. i./04,223; B.M.J. ii./04,1679,1734,1786.

Tablets 5, 7½, 10, 15 grains, or in Cachets.

Proponal. Dipropyl-Barbituric Acid

$(C_3H_7)_2C<\begin{matrix}CO.NH\\CO.NH\end{matrix}>CO$=210·62 (212·208 I. Wts.).

Dose.—2 to 8 grains (**0·13 to 0·52 Gm.**).

Chemically is a homologue of Veronal. A satisfactory hypnotic, but only very slightly soluble in water. It is readily dissolved by alkalis—hence probably acts on reaching the intestinal fluids.—L. i./06,126; B.M.J.E. i./06,72. More rapid in some instances than Veronal.

Ursal. *Dose.*—10 to 33 grains.

A combination of urea with salicylic acid in white acicular crystals partially soluble in water, readily so in alcohol. Used as a remedy in gout and rheumatism.

URETHANE.

$[CO(OC_2H_5)NH_2]$=88·43 (88·42 U.S. Wts.) (89 096 I. Wts). *Syn.*—**Ethyl Carbamate, U.S.** *Dose.*—10 to 60 grains (**0·65 to 4 Gm.**).

Colourless prismatic crystals, inodorous, with saline taste.

Incompatible with Caustic Alkalis and with Acids. ***Soluble*** 1 in 2 of Water; 1 in 1 of Alcohol 90%.

Uses.—Hypnotic, produces normal sleep, the heart is not affected; especially suitable for children; in cases of delirium tremens, and in acute mania and tetanus.

Larger doses than 15 grains do not, as a rule, increase the hypnotic effect. It frequently fails (as also does Hedonal) to produce sleep, probably owing to the stimulating action of the NH_2 grouping.—B. & C.D. ii./05,539. Tablets, 5 grains (0·32 Gm.).

Quinine Urethane. *Dose.*—½ to 3 grains (0·032 to 0·2 Gm.).

Employed hypodermically, as it is non-irritating.

Is obtained by heating Quinine Hydrochloride 3 with Urethane 15, and Water 3 parts.—P.J. ii./02,273.

Phenyl-Urethane; Carbanilic Ether.

Syn. EUPHORIN.

$CO<^{NH.C_6H_5}_{O.C_2H_5}$ =163·89 (165·128 I. Wts.).

Dose.—3 to 6 grains (0·2 to 0·4 Gm.) 3 to 5 times daily, preferably dissolved in Marsala or Malaga wine.

White crystals, slightly soluble in water, freely in alcohol, with a faint aromatic odour and slightly acrid taste.

An energetic antipyretic and useful analgesic in acute rheumatism, neuralgia, orchitis, and headache.

Methyl-propyl-carbinol Urethane, Hedonal.

Dose.—8 to 15 grains (0·5 to 1 Gm.) in cachets or suspended in water.

The Urethane of a secondary amyl alcohol in white micro-crystalline powder with saline taste, slightly soluble in water, more so in dilute alcohol; used as a hypnotic in neurasthenia and hysteria in women. Decomposes into water and carbonic acid in the system.

Will produce a sleep of 7 hours' duration.—P.J. i./00,210,754; B.M.J.E. ii./00,12.

30 grain doses an hour before operation as a hypnotic to supplement chloroform anæsthesia.—B.M.J.E. i./05, 34. Tablets contain 7½ grains (0·5 Gm.).

VALERIANÆ RHIZOMA (*Off.*). U.S.

The dried rhizoma and roots of *Valeriana officinalis* (*Valerianaceæ*), collected in the autumn.

Derbyshire Valerian is referred to *Valeriana Mikanii*—*Syme.*—P.J. ii./04,707.

Fresh Juice of Valerian said to be the best preparation.—L. i./05,1396.

Tinctura Valerianæ, U.S.

Average dose.—1 drachm. 1 in 5 of mixture of Alcohol (94·9% Vol.) and Water in proportion of 750 and 250.

Tinctura Valerianæ Ætherea, P. Austr.—1 in 5 of Spiritus Ætheris.

Tinctura Valerianæ Ammoniata (*Off.*) 1 in 5. *Dose.*—½ to 1 drachm (2 to 3·5 Cc.). U.S. 1 in 5 of Sal Volatile. Is of great value as an antispasmodic and nervine tonic for hysteria.

Mistura Valerianæ Composita, R.F.H.—Tincture of Valerian 30 minims, Fœtid Spirit of Ammonia 20 minims, Camphor Water to 1 ounce.

Fluidextractum Valerianæ, U.S. 1 = 1 Hydro-alcoholic. *Average dose.*—30 minims (2 Cc.). Of brownish colour; represents the full activity of the drug.

Extractum Valerianæ. *Dose.*—1 to 5 grains (0·065 to 0·32 Gm.). Prepared by concentrating the liquid extract.

Oleum Valerianæ. *Dose.*—1 to 5 minims (0·06 to 0·3Cc.). Yellowish in colour. A carminative in flatulence.

Acidum Valerianicum. *Dose.*—1 to 5 minims (0·06 to 0·30 Cc.), in syrup or in gelatin capsules. Consists principally of optically inactive Isovalerianic Acid $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-CH_2-COOH$,

with more or less dextrorotary Methyl-Ethyl Acetic Acid

$$CH_3-\begin{matrix}CH_2\\CH_3\end{matrix}\!\!>\!CH-COOH,$$

Empiric formula $C_5H_{10}O_2$=101·31 (102·08 I.Wts.). An oily liquid having Sp. Gr. about 0·93. Has been employed in hysteria and nervous diseases.

Ferri Valerianas, U.S. (1890.)

$Fe_2(C_5H_9O_2)_2(OH)_4$ = 379·34 (381·976 I. Wts.).

Dose.—3 to 15 grains (0·2 to 1 Gm.). A dark brick red amorphous powder, has a slight odour of the acid and a slightly astringent taste; is not soluble in water, and should be dispensed in cachets. Is a nervine stimulant and emmenagogue, and is used in anæmia, hysteria, and chorea.

Quininæ Valerianas, Quinine Valerianate.

$C_{20}H_{24}N_2O_2$, $C_5H_{10}O_2$=423·15 (426·352 I. Wts.).

Dose.—1 to 4 grains (0·605 to 0·26 Gm.).

White crystals, odourless, or a white powder with slight odour, soluble 1 in 110 of cold water; best administered in pills with glycerin of tragacanth and a little acacia as excipients; in nervous headache and hysteria.

Sodii Valerianas.

$C_5H_9O_2Na$=123·19 (124·122 I. Wts.).

Dose.—1 to 5 grains (0·065 to 0·32 Gm.).

In white crystals; used as a nervine sedative in hysteria and mania.

Mistura Sodii Valerianatis, N.H.W.

Sodium Valerianate 3 grains, Tincture of Nux Vomica 3 minims, Tincture of Capsicum 4 minims, Water to ½ ounce.

Zinci Valerianas, Zinc Isovalerianate (*Off.*).

ZINCI VALERAS, U.S.

$(C_4H_9COO)_2Zn$=265·53 (267 544 I. Wts.). (U.S. $+2H_2O$=301·28.)

Dose.—1 to 3 grains (0·065 to 0·2 Gm.).

In pearly tabular crystals. Pills containing 3 grains in each are generally kept prepared.

Incompatibility.—Acids and metallic salts. (*See also* Zinc salts.)

Pilula Zinci Valerianatis, T.H.

Zinc Valerianate 1 grain, Compound Pill of Asafetida 2 grains. *Dose*, 1 or 2.

Zinc Valerianate prevented recurrence of attacks of hay fever.—B.M.J. i./96,967.

Valerianic Diethylamide. *Syn.* VALYL.

Dose.—2 grains (0.13 Gm.).

An oily liquid of a somewhat nauseous taste and odour.

Gelatin capsules under the above synonym are in use as a substitute for valerian preparations, and are given in the treatment of nervous and utero-genital affections.

Borneol-isovalerianate. *Syn.* BORNYVAL. A proprietary preparation in capsule form. A valerian substitute. In cardiac neurosis, hysteria, neurasthenia, etc.

VERATRI VIRIDIS RHIZOMA.

Green Hellebore Rhizome.

Dose, in powder.—1 to 5 grains (0·065 to 0·32 Gm.)

The dried rhizome and rootlets of *Veratrum viride* (*Liliaceæ*), imported from and official in U.S. Its powder excites sneezing, and it contains the alkaloids Jervine, Veratrine, and Veratroidine. The rhizome of *V. album* (*Liliaceæ*) and a Wine prepared from it were official in P.L. 1851. (*White Hellebore* emetic, purgative and parasiticide, contains the alkaloids protoveratrine jervine, rubijervine, and pseudojervine—P.J. i./06,283. It possesses similar properties to *V. viride*.) This is official in U.S.—in addition—under the collective name Veratrum. They are recommended as cardiac, arterial, and nervous sedatives. They are said not to be narcotic, but they lower the pulse, respirations, and temperature of the body; act on the heart as powerful cardiac poisons analogous to digitalis, but are much more rapid in action; do not lower the temperature in health. For puerperal eclampsia valuable from their control over increased arterial tension and cerebro-spinal excitement.

Veratrum Viride must be distinguished from Helleborus Niger (*Ranunculaceæ*), the Black Hellebore, or Christmas Rose, which is purgative and emmenagogue.

Tinctura Veratri Viridis, B.P.C. (**B.P.** 1885.)

1 in 5 of alcohol 90%.

Dose.—5 to 15 minims (0·3 to 0·9 Cc.).

The U.S. Tincture (*average dose*, 15 minims) is 1 in 10 Alcohol 94·9% volume (was 4 in 10 in 1890).

Useful in apoplexy from hæmorrhage or effusion, and for cerebral complications in erysipelas.

Uræmic convulsions checked.—B.M.J.E. i./03,24.

Fluidextractum Veratri, U.S.

Hydro-alcoholic 1=1. *Average dose*.—1½ minims.

VERATRINA (*Off.*). U.S.

Syn. CEVADINUM, Ph. Ned.

$C_{32}H_{49}NO_9$ (Merck) = 586·98 (591·432 I. Wts.).

Dose.—$\frac{1}{70}$ to $\frac{1}{10}$ grain (0·0009 to 0·004 Gm.), in a pill carefully triturated with milk sugar and glycerin of tragacanth. An alkaloid, or mixture of

alkaloids, obtained from Sabadilla or Cevadilla seeds —*Schœnocaulon* (*Asagræa*) *officinale* (*Liliaceæ*)—in white or greyish white pulverulent masses; it powerfully irritates the nostrils and excites sneezing; taste bitter and acrid. Nearly insoluble in water; ***soluble*** 1 in 3 of 90% alcohol; 1 in 6 of ether; readily and almost completely in diluted acids (a little resin is left). It is poisonous, but has been used as an antipyretic and circulatory sedative in fevers and acute inflammations—resembles Aconitine in its general effects—irritates mucous membranes, causes sneezing, pricking and twitching of the skin, given in large doses it causes vomiting and purging; sometimes given for neuralgia, spasm, rheumatism and gout, but its principal use is externally in the form of ointment for neuralgic pains.

(?) Worth retaining in B.P. or better to replace with cevadine.—Naylor, P.J., July 28, '06.

Pharmacologically the effect of Veratrine is principally seen in its action on muscle—an increased irritability and power of doing work.—Dixon.

Laville's remedy contains veratrine. B.M.J.i./04,1296.

Oleatum Veratrinæ, U.S.

Veratrine 2, Oleic Acid (by weight) 50, Olive Oil to 100. Useful for neuralgia. Too weak, 10% preferable. It is employed as a pigment.

Unguentum Veratrinæ (*Off.*).

Veratrine 1, Oleic Acid (by weight) 4 (1 grain=2 drops); warm gently to dissolve, add lard 45. If applied for some time, it will produce a red rash. Like aconitine ointment, it is useful for neuralgia. U.S. has Veratrine 4, Almond Oil 6, Benzoated Lard 90. It proves very useful in the treatment of sciatica, rubbed into the painful part for 20 to 30 minutes, 2 or 3 times a day, also useful in the neuralgic pain consequent on shingles.

Alcoholic tremor, and that of sclerosis were relieved by $\frac{1}{130}$ grain doses four times a day.

Internally and externally, recommended for pruritus.

VERBASCUM THAPSUS.

Great Mullein.

This indigenous scrophulariaceous plant is much used as a household remedy on the Continent, and a sweetened

ecoction in milk, 1 in 5 of fresh leaves or about 1 in 0 of dried, is employed in Ireland in incipient phthisis or its weight-increasing and curative power.

The dried leaves are smoked for phthisical cough.

Tinctura Verbasci. 1 in 8 of proof Spirit.

Dose.—20 to 60 minims (1·2 to 3·5 Cc.).

ZINCUM (*Off.*), U.S.

Zn = 64·91 (64·9 U.S. Wts.) (65·4 I. Wts.).

Zinc, Arsenic-free.

To prepare, melt in a clay crucible and add small ieces of Sodium at intervals, about 15 grains to a ound of the Zinc. Remove the scum, avoiding iron nplements throughout, and repeat the operation in nother clean crucible. Granulate by pouring into ater when almost solidified.—O. Hehner.

Incompatibilities of Zinc Salts.—lkaline carbonates and alkalis in general, vegetable ıfusions and milk.

Antidotes.—Alkaline Carbonates in warm water, emulcents, Milk and Egg, Tea and Tannin solutions.

inci Acetas (*Off.*), **U.S.**

$(CH_3COO)_2Zn, 3H_2O = 235·71$ (237·496 I. Wts.) .S. with $2H_2O = 217·82$ (U.S. Wts.).

Dose.—1 to 2 grains (0·065 to 0·13 Gm.) as a ervine tonic, 10 grains for an emetic dose.

White crystals with faint acetous odour. Soluble in ater 1 in 2·5, about 1 in 40 of alcohol 90%.

Is used occasionally instead of the Sulphate as tringent lotion (¼ to 1%).

inol is a mixture of Zinc Acetate and Aluminium β-naphthol-disulphonate Solution 0·3% is used for gonorrhœal, vaginal and uterine catarrh.

inci Boras, Zinc Borate.

A white insoluble amorphous powder; applied in the rm of ointment is used for eczema.

inc Carbonas (*Off.*).

$ZnCO_3.(ZnH_2O_2)_2,H_2O = 339·68$ (342·248 I. Wts.).

inci Carbonas Præcipitatus, U.S., should yield 72% Zinc Oxide on ignition. These are employed as dusting powders to tender, reddened and excoriated surfaces, and to check unnatural perspiration.

Zinci Bromidum, Zinc Bromide, U.S.

$ZnBr_2 = 223{\cdot}61$ (223·62 U.S,) (225·32 I. Wts.).

Dose.—2 to 5 grains (**0·13 to 0·32 Gm.**) in water.

A white granular deliquescent powder, neutral in reaction, very soluble in water and alcohol, but some oxy-salt may be thrown out which, however, will redissolve on the addition of a small quantity of dilute hydrobromic acid. As both bromides and zinc salts have been used with success in epilepsy, this salt has been given with the intent of combining the action of both. Is incompatible with borax solution, zinc borate (basic) being formed.

Zinci Iodidum, U.S.

$ZnI_2 = 316{\cdot}71$ (316·7 U.S. Wts.) (319·34 I. Wts.).

Average dose.—1 grain (**0·065 Gm**).

A white deliquescent powder turning brown (liberation of Iodine) on exposure. May be tried for cerebral, spinal, and nervous diseases occurring in the third stage of syphilis—also in epilepsy.

Zinci Chloridum (*Off.*), **U.S.** $ZnCl_2 = 135{\cdot}29$ (135·26 U S. Wts.) (136·30 I. Wts.).

In deliquescent masses soluble 1 in 0·34 of water. Might well be estimated volumetrically with Silver Nitrate and Potassium Sulphocyanate.—P.J. i./02,551.

Causticum Zinci Chloridi.

Zinc Chloride 4, Solution of Antimony Chloride 2, Starch 1, Glycerin *q.s.*

Bougard's Caustic Paste.

Mix well in a mortar Wheat Flour 120 gr., with Starch 120 gr. and add (each finely powdered) Arsenious Acid 2 gr., Mercuric Sulphide 10 gr., Ammonium Chloride 10 gr., Mercuric Chloride 1 gr., finally add solution of Zinc Chloride 1 ounce.

Collodium Zinci Chloridi. 1 in 6 of collodion.

Collutorium Astringens, R.D.H.

Zinc Chloride 1 grain, Zinc Sulphate 1 grain, Water to 1 ounce.

Guttæ Zinci Chloridi, R.O.H. 0·5%.

Guttæ Zinci Chloridi cum Cocaina, R.O.H.

Zinc Chloride 0·5 and Cocaine Hydrochloride 2 (St Th. H. has only 0·25) in 100.

Liquor Zinci Chloridi (*Off.*). Sp. Gr. 1·530.

Four minims of this solution = 3 grains of solid

Zinc Chloride. On diluting this Liquor, or making a solution of the salt, with water, generally a white precipitate (Basic Oxychloride) is formed, which may be redissolved by adding a trace of hydrochloric acid. The U.S. preparation contains 50% Zinc Chloride.

Uses.—A powerful odourless caustic, antiseptic, and anti-putrescent. The Liquor is a powerful deodorising antiseptic solution; it is *very poisonous*. Ten grains to the ounce of water may be used as a stimulant lotion to wounds.

In the treatment of erosion of teeth is useful to touch painful spots, or the addition of a little to Chloroform-Mastich forms a useful paint.—Smale and Colyer.

Schulze's Reagent for Cellulose.

Zinc Chloride 250, Potassium Iodide 80, dissolved in Water 85 which is saturated with Iodine. Colours cellulose blue.

Pasta Zinci Chloridi, Mid. H.; R.O.H.

Macerate Opium, 1½ ounces, in 12 ounces of boiling water for 12 hours, add Hydrochloric Acid 6 drachms, and filter, dissolve Zinc Chloride 16 ounces in the filtered liquid, and add boiling water *q.s.* to 1 pint.

To 1 ounce of the above solution add wheaten flour 120 grains. Mix and heat in a water bath until of a proper consistence. ***Use.***—As a caustic for cancerous sores, spread on lint, one or more layers being employed. Zinc Chloride pounded with an equal weight of oil of theobroma is sometimes used, and may be formed into darts, spear or rod-shaped, for insertion into wounds or sores.

Pasta Zinci Chloridi, U.C.H.

Zinc Chloride 1, 2, or 4 parts, Starch in powder 6 Lard 1. Powder the Zinc Chloride, incorporate the Lard and starch, then add Glycerin of Starch *q.s.*

It is particularly useful in tongue cases, after the removal of tumours of the jaws, or operations about the anus, and after amputations or excisions in parts affected with putrid sinuses; and s useful in checking parenchymatous hæmorrhage after operations.

Pasta Zinci Chloridi Composita, U.C.H., is 4 of Opium Extract and Water 2 added to the simple ormula

One per cent. solution of Zinc Chloride injected into ranula and ganglions is painless; the cysts harden.—Y.B. 1891,202.

Subcutaneous injections may cause sloughing.—L. ii./94,11.

Zinc Chloride Solution as an interstitial injection for new growths has been used with some success.—B.M.J. i./93,694.

Zinci Citras, Zinc Citrate.

$$\left[C_3H_4(OH)\begin{matrix}COO\\-COO\\COO\end{matrix}\right]_2 Zn_3 + 2H_2O = 605{\cdot}73 (610{\cdot}312 \text{ I. Wts.}).$$

Dose.—3 to 12 grains (0·2 to 0·8 Gm.).

An amorphous white powder with a sharp metallic taste, not perfectly soluble in water, as some basic salt may be formed. Used for epilepsy.

Zinci Cyanidum, Zinc Cyanide.

$Zn(CN)_2 = 116{\cdot}61$ (117·48 I. Wts.).

Dose.—$\frac{1}{10}$ to 1 grain (0·0065 to 0·065 Gm.).

An insoluble white powder, is of value in heart diseases, and resembles digitalis in its effects in that it relieves palpitation and irregularity of action.

Possesses antiseptic properties, but not equal to the **Mercuro-Zinc Cyanide**, *q.v.*

Zinci et Potassii Cyanidum.

$Zn(CN)_2.2KCN = 245{\cdot}97$ (247·86 I. Wts.).

Dose.—$\frac{1}{10}$ to 1 grain (0·0065 to 0·065 Gm.).

Is a soluble cyanide, possessing all the properties of hydrocyanic acid in a stable form.

Zinci Lactas, Zinc Lactate.

$(C_2H_4.OH.COO)_2Zn + 3H_2O = 295{\cdot}29$ (297·528 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Is in white crystalline crusts, with a sharp metallic taste, soluble 1 in 60 of water, but insoluble in alcohol. This salt least deranges the stomach, and has been much used in France for epilepsy.

Zinci Nitras, Zinc Nitrate.

$Zn(NO_3)_2.6H_2O = 295.35$ (297.576 I. Wts.).

In deliquescent crystalline masses, is caustic like the chloride, but produces less pain.

Zinci Oxidum, Zinc Oxide (*Off.*, U.S.).

$ZnO = 80{\cdot}79$ (80·78 U.S.) (81.4 I. Wts.).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.).

Tablets, 2 grains.

Is a good nervine tonic, and is given for nervous debility, migraine, hysteria, and to check night sweats.

Unguentum Zinci (*Off.*). Zinc Oxide 3, Benzoated Lard, melted, 17. (U.S. 1 in 5 Benzoated Lard.)

Unguentum Zinci cum Acido Salicylico, Mid. H.
Salicylic Acid 40 grains, Zinc Ointment 1 ounce, Soft Paraffin 1 ounce.

Vaselinum Zinci Oxidi.
Zinc Oxide 1, White Vaseline 9. For surgical use.

Cremor Zinci.
Zinc Oxide 3, White Vaseline 17, Perfume *q.s.* Is much superior to violet powder for nursery use.

Cremor Zinci et Calaminæ, V.C.H.
Prepared Calamine 1, Zinc Oxide 1, Lime Water 4, Olive Oil 4.

Gelatinum Zinci, B.P.C. GELATUM ZINCUM.
Gelatin 3, Water 9, soak 12 hours, then heat to dissolve, and add Zinc Oxide 2, previously rubbed down with Glycerin $4\frac{3}{4}$. For use it is melted and applied with a brush to eczematous surfaces. — B.M.J. ii./87,449. Ichthyol and Resorcin may be added and the **Gelatin Basis** may be combined with other medicaments.

Gelatinum Zinci, V.C.H.
Gelatin 2 drachms, Zinc Oxide 3 drachms, Prepared Calamine $1\frac{1}{2}$ drachms, Ichthyol 10 grains, Glycerin 6 drachms, Water 1 ounce.

Gelatina Zinci, St. J. H.
White Gelatin 2, Zinc Oxide 1, Glycerin 3, Water 4. Use this form for making Gelatina Resorcin 3% St. J.H., Gelatina Picis 5% St. J.H., Gelatina Hydronaphthol 3% St. J.H. Use 1 part less of Zinc Oxide if to combine with ichthyol (10%), or precipitated sulphur (4%).

Glycogelatina Zinci Oxidi, Mid. H.
Zinc Oxide 3, Gelatin 3, Glycerin 6, Water 8. **Pasta Zinci Gelatini, St. Th. H.**, has also the same ingredients in different proportions.

Unna's Paste.
Zinc Oxide 5, Kaolin 1, Benzoated Lard 14. A soft form consists of equal parts of Prepared Chalk, Zinc Oxide, Linseed Oil and Lime Water.

Pasta Zinci cum Amylo, St. M.'s H.
Zinc Oxide, Starch, Vaseline, Lanolin, of each equal parts. For intertrigo and disordered perspiration.

Pellanthum (containing 20% Zinc Oxide) is a special preparation and is cooling and soothing for irritable surfaces.

Compounds are ichthyol, 3%, 5%, 10%; ichthyol, 10%, with resorcin 5%; salicylic acid 1% and 2%; liquor carbonis detergens 10% and 15%; Huile de Cade 5%; carbolic acid 2% with menthol 2%.

Pasta Unna, K.C.H.

Zinc Oxide 2, Gelatin 3, Glycerin 6, Water 8. Melt, mix and add Ichthyol (Ammonium) 2%.

For the inflammation and tenderness in thrombosis paint with stiff pigment of Zinc Oxide, Glycerin and Dilute Carbolic Acid.—L. i./06,741.

Pasta Zinci, V.C.H.

Zinc Oxide, Starch Powder, Hydrous Wool Fat, Soft Paraffin, of each 2 drachms, Salicylic Acid 10 grains.

Vernissum Glyco-Gelatin, "Zinc Varnish," W. H. has Gelatin 3, Zinc Oxide 3, Glycerin 5, Water 9. To this may be added 10 of Precipitated Sulphur, or 5 to 10 of Ichthyol.

Lassar's Paste for Eczema. Zinc Oxide 24, Starch 24, Salicylic Acid 2, Vaseline 50.

Pilula Zinci cum Belladonna, T.H.

Zinc Oxide 2 grains, Extract of Belladonna $\frac{1}{8}$ grain. (St. Th. H. has $\frac{1}{4}$ grain). *Dose.*—1 or 2 at bedtime.

Pulvis Zinci et Amyli. Zinc Oxide 1, Starch 2.

Pulvis Zinci et Hydrargyri Subchloridi (W. H., 1886). Zinc Oxide, Calomel, Tannic Acid, and Starch, equal parts.

Zinci Permanganas. $Zn(MnO_4)_2.2H_2O=336{\cdot}75$ (339·432 I. Wts.).

In urethritis, of 70 cases, 10 cured, in 54 discharge greatly diminished; absence of irritation marked, 1 grain in 8 ounces of water used.—B.M.J. i./89,1458.

Is used as an astringent in form of douche.

'**Solubes**' contain $\frac{1}{4}$ grain each to produce 2 ounces of solution for injection.

'**Collapsubes,**' with catheter attachment, of Zinc Permanganate in Soft Paraffin; strength 1 in 2,000 are prepared for urethral medication in chronic gonorrhœa.

Zinc Oxy Phosphate is employed as a dental filling. It is supplied in the form of dried powdered zinc oxide in various colours, with the liquid which consists of

phosphoric acid. These are mixed intimately prior to use as a flooring when not too near the pulp.

Zinc Oxy-Sulphate. This filling consists of the 'powder,' which is calcined zinc sulphate and zinc oxide and the 'liquid,' a mucilage of acacia.

Fletcher's Artificial Dentine is similar.

Zinc Oxy-Chloride. For dental use. The 'powder' consists of zinc oxide and the 'liquid' zinc chloride solution. Mix thoroughly. Sometimes used as a root-filling and for sensitive dentine. Will irritate a live pulp.

Zinci Salicylas.

$Zn(C_6H_4.OH.COO)_2+3H_2O=390{\cdot}57$ (393·528 I.Wts.).

Dose.—1 to 5 grains (0.065 to 0·32 Gm.).

White crystals soluble in water 1 in 24, and in alcohol 1 in 2·5. As dusting powder has been employed in skin affections, and may be combined with gelatin, in manner similar to the Gelatinum Zinci, *q.v.* Internally is sometimes a substitute for the valerianate.

Zinci Sulphas (*Off.*). **U.S.** $ZnSO_4,7H_2O$ = 285·41 (*Off.* and U.S. Wts.) (287·572 I.Wts.).

Dose.—1 to 3 gr. (0·065 to 0·2 Gm.) tonic; 10 to 30 gr. (0·65 to 2 Gm.) emetic.

Soluble 1 in 0·65 water at 59·5° F., P.J.i./02,552.

Collyrium Adstringens Luteum, P. Austr. (1889.) Ammonium Chloride 5, Zinc Sulphate $12\frac{1}{2}$, Distilled Water 2,000; dissolve and add Camphor 4, dissolved in Diluted Spirit (Sp. Gr. 0·895) 200. Then add Saffron 1. Digest 24 hours and filter. As an astringent lotion is used for conjunctivitis.

N.B.—P. Austr. (1906) has respectively 2, 5, 890, 2, 100, and 1 parts of the above.

Mellitum Escharoticum Solleysel, P. Belg.

Zinc Sulphate 16, Copper Subacetate 16, Litharge 8, Arsenious Acid 0·6, Honey 66. As a caustic to check exuberant granulations.

In hæmorrhage after dental extraction, especially if extensive laceration of the tissue has been necessary, an anodyne mouth wash is useful, *e.g.*, Zinc Sulphate 8 grains, Zinc Chloride 6 grains, Morphine Acetate 2 grains, Water to 8 ounces.—Smale and Colyer.

Lotio Rubra, U.C.H. Zinc Sulphate 2 grains, Compound Tincture of Lavender 12 minims, Water to 1 ounce.

'Solubes' Zinci Sulphatis are prepared, coloured red, equivalent to 2 and 10 ounces respectively of the above lotion.

'Solubes' Zinci Sulphatis et Aluminis contain 10 grains of each, coloured for dissolving in a pint, more or less as required, of warm water.

'Collapsubes' of Zinc Sulphate 1 grain in 1 ounce of gelatin basis are for gleet and gonorrhœa.

Lotio Sulphatum.

Zinc Sulphate 30 to 40 grains, Alum 30 to 40 grains, Ferrous Sulphate 20 grains, Copper Sulphate 2 grains, Water 8 ounces. For gleet.—B.M.J. i./89,1458.

Ophthalmic Discs contain $\frac{1}{250}$ grain **Zinc Sulphate**, and $\frac{1}{250}$ grain each **Zinc Sulphate and Opium**, respectively.

Points of Zinc Sulphate are moulded for intra-uterine use. **Points** of equal parts **Zinc Sulphate and Alum**, and of **Copper Sulphate** are also made.

Zinci Stearas, U.S.

A fine white powder, yielding 15·5% of Zinc Oxide. Contains a small proportion of palmitate.

Manufactured on same lines as Zinc Oleate, *q.v.*, employing Curd Soap *vice* Hard Soap.

Unguentum Zinci Stearatis, U.S.

Zinc Stearate and White Petrolatum equal parts melted together and stirred until cold.

Zinci Sulphis, Zinc Sulphite.

$ZnSO_3 + 2H_2O = 180{\cdot}13$ (181·492 I. Wts.)

A minutely crystalline white powder, soluble about 1 in 600 of water. A non-irritant antiseptic; allows formation of healthy tissue.

Gauze impregnated with Zinc Sulphite has been used.—B.M.J.ii./90,1063; P.J.1890,469; Pr xlvi.461.

ZINGIBER.

(*Off.*) **U.S., P. Austr., Ph. Ned.**

Dried rhizome (scraped) of *Zingiber officinale* (*Scitaminaceæ*). *Average dose.*—15 grains (1·0 Gm.) U.S.

Fluidextractum Zingiberis, U.S. 1=1 alcoholic. *Average dose.*—15 minims.

Syrupus Zingiberis. (*Off.*)
Ginger 1, Alcohol 90% *q.s.* to 2 by percolation, add Syrup *q.s.* to 40. *Dose.*—½ to 1 drachm (1·8 to 3·5 Cc.).

Syrupus Zingiberis, U.S.
Fluid extract of Ginger 3, Alcohol 2, Sugar 82, Water to 100, prepared *s.a.* and filtered through Magnesium Carbonate. *Average dose.*—4 drachms.

Fluidextractum Aromaticum, U.S.
Average dose.—15 minims.
Aromatic powder, U.S., 1 in Alcohol (94·9% vol.) 1, by maceration and percolation.

Pulvis Aromaticus, U.S. *Average dose.*—15 grains.
Saigon Cinnamon 35, Ginger 35, Cardamom 15, Nutmeg 15.

Oleoresina Zingiberis, U.S. *Dose.*—½ grain (0·03 Gm.). Prepared by acetone extraction.
The yield from unpeeled ginger is as much as 10%, while from Jamaica ginger rarely exceeds 6%.

Gingerin. *Dose*—¼ to 1 grain (0·016 to 0·065 Gm.), in a pill or much diluted with spirit.
The treacle-like oleo-resin with pungent taste obtained from ginger by percolation with ether and subsequent evaporation. Added to purgative pills to prevent griping.

Tinctura Carminativa, B.P.C.
Cardamom Seeds, bruised, 600 grains, Essence of Ginger 1¼ ounces (B.P. 1885), Oil of Cinnamon 100 minims, Oil of Caraway 100 minims, Oil of Clove 100 minims. Macerate the Cardamoms in 15 ounces of Alcohol (90%) for a week, decant, express, and dissolve the oils in the mixed tinctures, adding Alcohol (90%) *q.s.* to one pint. *Dose.*—2 to 10 minims (0·12 to 0·6 Cc.).

Tinctura Zingiberis Fortior, Essence of Ginger, B.P.C., Ginger 1, in Alcohol (90%) 2. *Dose.*—5 to 20 minims.

Tinctura Zingiberis (*Off.*) *Dose.*—30 to 60 minims.
1 in 10 Alcohol 90%. (U.S. 1 in 5 Alcohol 94·9% vol.)

Tinctura Cinnamomi Composita P.L.
Dose—20 to 40 minims (1·2 to 2·4 Cc.).
Cinnamon Bark 16, Cardamom Seeds 8, Long Pepper 5, Ginger 5, Alcohol 60% 640. Macerate seven days.

SUPPLEMENTARY LIST OF DRUGS.

Acidum Carbonicum. $CO_2 = 43{\cdot}67$ (44 I.Wts.).—Carbon Dioxide, Carbonic Anhydride. The gas inhaled for relief of leucocythæmia, trial recommended.—B.M.J. ii./98,235. Carbonic Snow on cotton wool as a cold application.—B.M.J. ii./98,433. For cardiac dyspnœa and pain of angina.—B.M.J. ii./99,1178.

Acidium Gallicum. $C_6H_2\begin{cases}(OH)_3\\COOH\end{cases} + H_2O = 186{\cdot}65$ (188·064 I.Wts.). *Dose*, 5 to 15 grains. Crystals or crystalline powder of brownish colour. Soluble in water about 1 in 100, in glycerin 1 in 6, in alcohol 90% 1 in 8. Properties and uses similar to Tannic Acid *q.v.*

Acidum Malicum. *Syn.* **Hydroxysuccinic Acid.** $C_2H_3(OH)(COOH)_2 = 133{\cdot}04$ (134·048 I. Wts.). *Dose*, 1 to 5 grains. White deliquescent crystals soluble in water 1 in 1, and in Alcohol 1 in 1½. Has been used as throat spray in diphtheria, and in throat affections. Possesses properties similar to Tartaric Acid in a modified form. It is chemically allied to Succinic Acid.

Acidum Meconicum. $C_7H_4O_7,3H_2O = 252{\cdot}17$ (254·08 I. Wts.). White crystals slightly soluble in water. Forms soluble salts with Opium Alkaloids. Is not poisonous. Apparently only contains 2 Carboxyl groups, though triatomic. Salts are of variable composition.—P.J. ii./05,548. Various alkyl-meconines described.—J.C.S.A., Vol. I., 303.

Aconitum ferox, renamed *A. spicatum*. (According to Holmes *A. laciniatum* is the probable source of Nepaul Aconite).—Root, called *Bish* or *Bikh* in India. Contains Bikhaconitine (see p. 75), virulently poisonous. It is the analogue of pseudaconitine. It is permissible to administer in dose ¾ of that of *Aconitine* from *A. Napellus*.—C.D. ii./05,478. It comes from the Himalayas, probably mixed with the root of other species of aconite, and is in bolder roots than the aconite root imported from Germany. Therapeutically, its action resembles that of *A. Napellus*, but is more diuretic and less antipyretic and diaphoretic. Internally, has relieved many cases of neuralgia and acute gout, and forms a valuable liniment for chilblains. Tincture, 1 in 8 of 90% alcohol. *Dose*, 1 minim hourly. Botanical descriptions of poisonous and non-poisonous Indian Aconites.—P.J. i./03,63.

Aconitum Fischeri.—Produces Japanese Aconite Root, of which much has at times been imported. It is also said to come from Kamskatka. It is very pungent, and yields Japaconitine (P.J. 1894,813) *v.p.* 75. *A. japonicum*, with yellowish white flowers, has been identified as a variety of *A. Lycoctonum*.

Aconitum heterophyllum.—Root, known as *Atis* or *Atees*, or *Jadbar* in India, is neither poisonous nor antipyretic, but is tonic, and possibly aphrodisiac in action. It contains a large quantity of starch. *Dose*, in powder, 5 to 20 grains; of tincture, 1 in 8 of 90% alcohol, 10 to 60 minims.

Adonis vernalis (P. Austr.).—Contains a hygroscopic glucoside Adonidin, which resembles Digitalis in its action, but is said not to be cumulative. *Dose*, in powder, 3 to 6 grains; of infusion 1 in 40, 4 drachms; of Adonidin, $\frac{1}{4}$ to $\frac{1}{2}$ grain daily. Is a cardiac tonic and diuretic.—Successful use; disappearance of throbbing headache, perspiration, and dyspnœa; sedative, but little diuretic, raises arterial tension.—L. ii./88,1012. Relieves præcordial pain in mitral and aortic regurgitation; urine increased and coloured yellow.—L. i./89, 596; ii./91,505; B.M.J. ii./92,1156. Use with bromides for epilepsy.—L. ii./94,1298; P.J. ii./95,391; B.M.J.E. i./98,44. Adonidin is rapid and certain in action. Tincture of Adonis,—Leaves and Stalks employed 1 in 10. *Dose*, 10 to 30 minims.

Æsculus Hippocastanum.—Horse-Chestnut. Tincture of Seeds 1 in 10 proof spirit for painful hæmorrhoids. *Dose*, 10 minims night and morning. Also emmenagogue.—P.J. ii./96,79. A liquid extract has been used, painted on or rubbed in in rheumatism and neuralgia. Powder and Tablets sold under the name of **Antiarthrin** are said to contain an extract of the plant and Salicin for use in rheumatism.

Æsculin, $C_{15}H_{16}O_9.1\frac{1}{2}H_2O = 364{\cdot}39$ (367·152 I. Wts.), a glucoside, soluble in water, to which 2 to 3% of Sodium Carbonate is added, also soluble in alcohol. Solutions have a blue fluorescence, and have been used similarly to Quinine in X-ray and Finsen light treatment (*q.v.*). *Dose*, 1 to 5 minims of 5% solution.

Æthusa Cynapium.—Fool's Parsley, Lesser Hemlock. Contains a small amount of volatile alkaloid, with the properties of Conine; calculated as hydrochloride constitutes 0·0003% of the entire fresh herb. A larger proportion, under favourable conditions, may be produced leading to poisonous properties. It also contains a volatile oil, 0·015% of the entire fresh plant and resin 0·8%. Has narcotic properties.

Garden Parsley (*Petroselinum sativum*) contains no alkaloid.—L. ii./05,617; P.J. ii./05, 548; C.D. ii./05,268.

Agar-Agar.—Japanese Isinglass. Is in membrane-like strips, consisting of the dried jelly of *Gelidium corneum*, a seaweed. Another variety comes from Borneo. 1 in boiling water 200, forms on cooling, a transparent jelly, suitable for invalids; it is used in preparation of culture media for bacteria (*q.v.*); also for finishing calicoes, silks, &c.

Agaricus Albus. — *Syn.* Polyporus Officinalis, Boletus Laricis, Fungus Laricis (P. Austr.), Purging Agaric. *Dose*, 10 to 30 grains. Light, spongy pieces. Large doses purgative, small ones astringent for night sweats, diarrhœa, and to diminish bronchial secretion. Tincture 1 in 10 of 60% alcohol. *Dose*, 20 to 60 minims. Not to be confused with the fly agaric, Amanita Muscaria. Muscarin, $N\begin{cases}(CH_3)_3\\OH\\CH_2COH\end{cases} = 118{\cdot}25$ (119·144 I.Wts.), its action on the heart.—B.M.J., ii./04,740

Acidum Agaricum, Agaricin P.G., $C_{14}H_{27}(OH)\begin{cases}COOH\\COOH\end{cases} + H_2O = 317{\cdot}84$ (320·256 I. Wts.), Laricic Acid. *Dose*, $\frac{1}{6}$ to $\frac{1}{3}$ grain is given to restrain the sweating of phthisis. **Bismuth** and **Lithium Agaricinates** are described,—F.N., 1906, 15.

Alchemilla Arvensis (*Rosaceæ*).—Small annual plants with green flowers. Is superior to buchu in some instances. Infusion of leaves 1 in 10. *Dose*, 1 to 2 ounces.

Aletris Farinosa, B.P.C.—Star Grass. From the rhizome of this are prepared a Fluid Extract with diluted alcohol, U.S. (1890, 1=1) *dose*, 5 to 15 minims, and a Cordial or Elixir (B.P.C. containing Liquid Extract of Aletris 5, Liquid Extract of Liquorice $1\frac{1}{4}$, Tincture of Orange $1\frac{1}{4}$, Syrup $7\frac{1}{2}$, Water to 20), *dose* $\frac{1}{2}$ to 1 drachm, are used as uterine tonics.

Alginoid Iron.—*Dose*, 2 to 15 grains. Alginic Acid from seaweed is combined with iron, forming an insoluble brown powder containing about 11% of iron. Does not constipate; is given for anæmia. Pills and pellets are prepared.

Cupri Alginas. *Dose.*—$\frac{1}{24}$ to $\frac{1}{6}$ grain. A green powder. Used in lupus, leprosy, cancer and anæmia.—B.M.J. i./06,1464.

Allium.—Garlic. U.S. (1890). The bulb of *Allium sativum*. *Dose*, $\frac{1}{2}$ to 2 drachms. Useful in cases of dilated bronchi with fetid expectoration; expectoration lessened and fetor disappeared.—Clinical Journal, Jan. 24, 31, 1894. Juice.—*Dose*, 10 to 30 minims. Extract=inspissated juice. *Dose*, 4 to 10 grains. Pill contains 4 grains extract. Syrupus Allii Aceticus, U.S. (1890) 1 in 5. *Dose*, 1 to 4 drachms. In pulmonary phthisis it diminishes cough and often expectoration ceases, lessens night-sweats, improves appetite, weight is gained and sleep becomes regular under its continued use.—B.M.J.E. i./00,104; L. ii./94,957; L. i./04,90,481,1026. In bronchiectasis.—B.M.J.i./06, 83. The juice to allay nervous vomiting.—H.

Alphozone, Disuccinyl Peroxide. $(COOH.CH_2.CH_2.CO)_2O_2 = 232{\cdot}32$ (234·08 I. Wts.). Non-toxic germicide and antiseptic. Soluble 1 in 60. Solutions should be freshly made. For internal use 2 grains to be added to half a tumbler of water. The solution has an acid and not unpleasant taste. For local use strength 1 in 3,000 to 1%. Dusting Powder 5%. Unguentum with paraffin basis 8 grains to the ounce. Tablets and powder prepared.—B.M.J. i./05,1150; L. i./05,367.

Alstonia constricta, I.C.Add.—Bark used in Australia as a febrifuge. *Dose*, in powder, 5 grains. A crystalline alkaloid, Alstonine or Chlorogenine, $C_{21}H_{20}N_2O_4,3\frac{1}{2}H_2O = 424{\cdot}09$ (427·296 I. Wts.), has been isolated from it. Tincture, 1 in 8 Alcohol 60%. *Dose*, $\frac{1}{2}$ to 1 drachm. Should be less, 5 to 20 minims. Influenza well treated by Tincture, 10 minim doses.—L. i./01,399; P.J. i./01,362, *vide* also p. xxiii.

Three other alkaloids exist in it. A mild diaphoretic. The dose in I. C. Add. said to be too large—twice too much. When prescribing the tincture that of *A. constricta* should be specified.—L. i./03,375.

Alstonia scholaris, I.C. Add.—Dita Bark, from India and the Philippine Islands. Contains a crystalline alkaloid, Ditaine, *syn.* Echitamine, $C_{20}H_{28}N_2O_4 = 381{\cdot}42$ (384·304 I. Wts.), and the milky juice of the tree forms a substance resembling gutta-percha. Tincture, 1 in 8 Alcohol 60% *Dose*, $\frac{1}{2}$ to 1 drachm.—P.J. i./01,362, *vide* also p. xxiii.

Althæa. U.S. Marshmallow, dried root of *Althæa officinalis*, *Linné* (*Malvaceæ*) from second year's growth and deprived of the periderm. Contains Asparagin, *q.v.* Is mucilaginous and used in pill making to give 'body' and support.

Alyxia Stellata. Bark of stem and branches (*Apocynaceæ*) Ph. Ned. Yields Coumarin. Employed in East Indies.—N.S.D. *p.* 203.

Amadou.—Oak agaric, Surgeons' agaric, Touchwood. *Polyporus fomentarius*, L. A fungus prepared with alkali and nitre, in light brown elastic pieces employed as a mechanical hæmostatic. It is included in P. Austr. under the name *Fungus igniarius*.

Anacardium occidentale.—Cashew Nut. The pericarp of this contains a vesicating oily liquid, which consists of 10% of Cardol (to which the vesicating properties are due), and 90% of Anacardic Acid, $C_{22}H_{32}O_3 = 341{\cdot}66$ (344·256 I. Wts.). The oil has been used in leprosy, ringworm, ulcers, corns, and internally as a vermifuge. Tincture, 1 in 10 Alcohol 90%. *Dose*, 2 to 10 minims. **Anacardii Folia** are in Ph. Ned. The Marking Nut, from *A. Officinarum*, possesses similar properties.
Andrographis, I.C.Add, *v.pp.* xxiii., 738.

Anhalonium Lewinii.—Mescal Buttons, the fruit of this is eaten by the Mexican Indians to produce intoxication accompanied by visions. Effects due to alkaloids, Anhalonine, $C_{12}H_{15}NO_3 = 219{\cdot}50$ (221·16 I. Wts.), and Mescaline, $C_{11}H_{17}NO_3(?) = 209{\cdot}59$ (211·176 I. Wts.). Mescaline is the principle to which the peculiar visual hallucinations are due.—Pr. lxi.71. Effects of Mescal.—P.J. ii./99,357.

Anhalonium Williamsii contains an alkaloid Pellotine, $C_{11}H_{13}NO(O.CH_3)_2 = 235{\cdot}41$ (237·192 I. Wts.), which has been used as an hypnotic in dose of $\frac{1}{3}$ to $\frac{2}{3}$ grain, internally and injected. — B.M.J.E. ii./96,67; P.J. i./96,502. Pellotine Hydrochloride, $C_{11}H_{13}NO(O.CH_3)_2HCl = 271{\cdot}60$ (273·65 I. Wts.), as a hypnotic.—P.J. i./99,583.

Anisi Fructus (*Off.*), U.S. (cultivated fruits). Anise. Dried ripe fruit of *Pimpinella Anisum*, Linn. (*Umbelliferæ*). Contains **Oleum Anisi** (*Off.*), which is also distilled from the Star Anise (*Illicium verum*). *Dose*, $\frac{1}{2}$ to 3 minims. Aromatic and carminative. Colourless or yellowish oil congealing between 10 and 15°C. Sp. Gr. at 20°C., 0·975 to 0·990. **Aqua Anisi** (*Off.*).—Anise Fruit 1 pound, Water 2 gallons. Distil $\frac{1}{2}$. **Spiritus Anisi** (*Off.*).—1 in 10 in Alcohol 90%. *Dose*, 5 to 20 minims. **Anethol** (P. Austr., Ph. Ned., P. Belg.), $C_{10}H_{12}O = 146{\cdot}98$ (148·096 I. Wts.). The stearoptene from the Anise Oils melts at 20°C., B.-Pt. 230° C. Sp. Gr. (Ph. Ned.) 0·984 to 0·986. Soluble in Alcohol 90% 1 in 3 approximately.

Anthemis nobilis.—Chamomile Flowers (*Compositæ*), (*Off.*). U.S. Tonic, aromatic, stomachic, emetic in large doses. In addition to official Extract, Infusion, and Oil, a Tincture, 2 of single fresh flowers in Alcohol (90%) 3, and Water 1, is used for summer diarrhœa of children. *Dose*, 3 to 10 minims.

Anthoxanthum odoratum.—Sweet Vernal Grass. Flowers develop odour of coumarin on drying. Tincture, 1 of fresh-flowering herb in 10 of 40 O.P. spirit (making allowance for the moisture the plant contains). *Dose*, 2 to 6 minims, internally and diluted as a lotion for hay fever.

Antiaris toxicaria.—Upas tree of Java; milky juice of tree contains a principle, Antiarin, $C_{14}H_{20}O_5 + 2H_2O = 301{\cdot}90$

(304·192 I. Wts.), recommended in the treatment of heart disease. Kiliani's research on the juice.—P.J. ii./96,137; Y.B. 1898,10; P.J.i./03,385.

Apis Mellifica.—The Honey Bee. A Tincture—*Dose* 1 minim hourly, is prepared, which is said to have decided effect in relieving urticaria.—Leonard & Christy's Diet. Mat. Med., p. 43.

Arachis Hypogœa (Pea Nut, Ground Nut, Goober Nut).—The seeds of the plant form the 'pea nuts' of commerce. Have dry, brittle envelope and yellowish-white kernel. Very rich in a non-drying oil (40%). Ground down employed as cake for cattle. The Vitellin is used as food (see Almo Food).

Arbutin, $C_{12}H_{16}O_7+\frac{1}{2}H_2O=279{\cdot}02$ (281·136 I.Wts.).—A crystallized glucoside obtained from the leaves of *Arctostaphylos Uva-ursi* (*Ericeæ*) U.S. (Fluidextractum 1=1 Glycero-hydro-alcoholic), Bearberry, and other ericaceous plants. It is given for chronic cystitis and vesical catarrh, in dose of 5 to 15 grains with sugar; is not poisonous. Liquid extract of Uva Ursi leaves, *dose*, 20 to 40 minims, is preferable, the Infusion (*Off.*) has 1 ounce to 1 pint of boiling water. Antiseptic; also as vermifuge for dogs 60 to 100 grains. Arbutin, given *per os*, is partly decomposed with formation of Hydrokinone, but most of it is absorbed by the kidneys.—D xon.

Cellotropine, Arbutin - Benzoic - Ether, $C_6H_4.OC_6H_{11}O_5.OCOC_6H_5=373{\cdot}33$ (376·16 I.Wts.), ½ grain doses in phthisis.—F.N. 1906,54.

Areca, Semen Arecæ, P.G. iv. Betel Nut. B. P. Add. 1874.—From *Areca Catechu* (*Palmaceæ*). *Dose*, 1 to 4 drachms. Is astringent, and is used as a vermifuge, especially for dogs; is also used as a masticatory and added to dentifrices. Contains several alkaloids, the most active of which is **Arecoline,** $C_8H_{13}NO_2=153{\cdot}98$ (155·144 I. Wts.), a liquid which forms a white crystalline **hydrobromide** P.G. iv., $C_8H_{13}NO_2,HBr=234{\cdot}33$ (236·112 I. Wts.). Its physiological action is allied to that of pelletierine and pilocarpine. Taken internally, causes vomiting and diarrhœa.—B.M.J.E. ii./90,15. Is sialogogue and diaphoretic.—B.M.J.E.ii./95,99. Arecoline resembles physostigmine as amyotic 1% solution suitable.—P.J. ii./96,39; M.C. Nov./97,151; Y.B. 1898,368; B.M.J. i./99,82. Serviceable in glaucoma. By some considered the best myotic, "Ocular Therapeutics."—M.P. Aug./1905.

Tenaline, a liquid specialty, used in veterinary practice; is an efficient vermifuge. *Dose*, 1 minim for each pound of the weight of the dog.—B.M.J.E. i./98,35.

Arenaria rubra.—A solid extract and a liquid extract of the entire herb have been used in chronic and acute cystitis, when there is dysuria.—P. J.ii./01,307.

Asafetida (*Off.*).—Gum resin obtained by incision from the root of *Ferula Fœtida* and probably other species. B.P. requires not more than 10% ash, and not less than 65% soluble in alcohol 90%: 20% Ash and 40% Alcohol soluble would be preferable. Nervine stimulant, relieves hysteria, flatulence of typhoid, and enteritis. **Emulsum Asafœtidæ,** U.S. Asafœtida 40, Water to 1,000. **Tincture** (*Off.*). 1 in 5 Alcohol 70%. *Dose*, ½ to 1 drachm. U.S. 1 in 5. *Average dose*, 15 minims.

Asclepias cornuti (A. SYRIACA).—Is diaphoretic and diuretic. Tincture, 1 in 10. *Dose*, 5 to 40 minims.

Asclepias incarnata.—White Indian Hemp rhizome. Is a speedy, potent, and reliable diuretic.—Pr. xxiii.141. Tincture, 1 in 10. *Dose*, 5 to 40 minims.

Asclepias tuberosa.—Pleurisy Root. Is expectorant and diuretic. Tincture, 1 in 10. *Dose*, 5 to 40 minims.

Avena Sativa.—Tincture of the oat in 20 minim doses recommended to relieve nervous condition induced by eruption in dermatitis.—Fox, Photog. Atlas of Diseases of Skin, vol. ii., *p.* 66.

Balsamum Gurjunæ.—Gurjun Balsam; Wood Oil. *Dose*, ½ to 2 drachms. A greenish fluorescent balsam from the trunk of the growing tree *Dipterocarpus turbinatus* and other species of this genus; imported from the East Indies. Has aromatic odour and taste, and has been used as an adulterant of copaiba. It is not completely soluble in either ether or alcohol. Used with success for gonorrhœa, and as a liniment for leprosy; also in emulsion with lime-water, which is given freely internally. As an expectorant, given with malt extract.—L. i./90,962.

Balsamum Peruvianum. (*Off.*) U.S. *Dose*, 5 to 15 minims. From trunk of *Myroxylon Pereiræ*. U.S. *Toluifera Pereira* (*Leguminosæ*). A viscid liquid insoluble in water, soluble in chloroform, absolute alcohol, and glacial acetic acid; slightly in ether and petroleum benzine. Contains Cinnamein and Cinnamic Acid. Sp. Gr. between 1·140 and 1·153. "Synthetic" Balsam, recently placed on the market, may be detected by shaking 2 Gm. with 10 Gm. of Petroleum Spirit. Evaporate the Petroleum Solution on a water bath, dry on same 10 minutes, cool, and add three drops Nitric Acid 1·38. Mix. Pure balsam gives a golden yellow colour. Inhalation of a few drops of vapour 1 in alcohol 2 in a little hot water useful in pharyngitis. As a dressing in war; may be left on wounds, if aseptic, for 20 days if necessary.—L.i./04,1807.

Balsamum Tolutanum. (*Off.*) *Dose*, 5 to 15 grains Obtained from the trunk of *Myroxylon Toluifera* (*N.O. Leguminosæ*). Recently prepared is soft, but becomes brittle in cold weather. Soluble 1 in 1 alcohol 90%. A minimum standard of 30% total aromatic acids, of which ⅔ is combined, is suggested by Mann. **Syrupus Tolutanus.** (*Off.*) *Dose*, ½ to 1 drachm. Boil balsam 1¼ ounces with water 1 pint half an hour, make up to 16 when cold, filter and dissolve sugar 2lbs. on water bath. Should weigh 3lbs. **Tinctura Tolutana** (*Off.*) 1 in 10 alcohol 90%. *Dose*, ½ to 1 drachm. **Syrupus Tolutanus U.S.** is Tincture of Tolu (1 in 5 of Alcohol 94·9% vol.) in 5 parts, Sugar 82, Magnesium Carbonate 1, Water to 100 *s.a.*

Baptisin. *Dose*, 1 to 5 grains. An extractive from Baptisia tinctoria, in small doses a laxative, in large doses a cathartic. Tincture 1 in 10 of Alcohol 60%. *Dose.*—5 to 30 minims.

Beberinæ Sulphas. *Syn.*—Buxine and Pelosine. Probably a mixture of Sulphates of Beberine, $C_{36}H_{42}N_2O_6$, and Nectandrine, $C_{40}H_{46}N_2O_8$. *Dose*, 1 to 10 grains; if in a mixture a little Aromatic Sulphuric Acid covers its bitterness. It is in scales, and is prepared from the bark of *Nectandra Rodiæi*, Bebeeru bark. It is freely soluble in water.

Beberine Hydrochloride is in reddish brown scales. Use antipyretic and tonic as Quinine; valuable for menorrhagia.

Bixæ Folia, Ph. Ned. (*Bixacaceæ*). The leaves o *B. Orellana*. Annatto is obtained from the seeds.—N.S.D.*p.*242

Blatta (Periplaneta) orientalis.—Cockroach. Is an ol Russian remedy for dropsy. *Dose*, 2 to 8 grains, in powder o in tincture, strength 1 in 16, and in West Indies is used as an antispasmodic—*e.g.*, for whooping-cough.

Blepharis Capensis.—This South African plant is recom mended as a remedy for anthrax. Tincture, 1 in 8 of 90% Alcohol. *Dose.*—16 minims (1 Cc.) every three hours gradually lessened, as the drug is an active one.—P.J.i./98,140 Recommended in snake bites and insect bites, also for tooth ache.—P.J. ii./00,63.

Boldoa fragrans (*Peumus Boldus*). *Dose*, 1 to 3 grains i cachet or capsule. The leaves, from Chili and Bolivia, re semble those of Sweet Gale (*Myrica Gale*), but are mor aromatic. In dyspepsia, liver affections, rheumatism, an as a diuretic for atony of the bladder. Boldin, $C_{30}H_{52}O$ = 536·34 (540·416 I. Wts.), a glucoside, has hypnotic properties and said also to have local anæsthetic properties like cocaine Tincture of Boldo, 1 in 5 of 90% alcohol. *Dose*, 10 to 2 minims.—B.M.J. ii./85,1134; i./88,918.

Boxwood, West African. Contains a toxic alkaloid which causes poisonous symptoms through being used fo making shuttles in Lancashire.—L. i./06,778.

Brucea Sumatrana (*Simarubaceæ*). **Grana Macassaria.** The fruit (**Ph. Ned.**) is employed as anthelmintic and antidysenteric. *See also* Kosam Seeds.

Brucine, $C_{23}H_{26}N_2O_4 + 4H_2O$ = 462·85 (466·352 I. Wts.) *Dose*, $\frac{1}{12}$ to $\frac{1}{2}$ grain. An alkaloid from *Strychnos Nux Vomic* seeds—small white acicular crystals, with bitter taste. Ver soluble in Alcohol and Chloroform. Its salts are soluble i water. Like Morphine it gives a red colour with nitric aci (*see* Water Analysis), which Strychnine should not. It i said to possess only $\frac{1}{12}$ of the physiological power of Strych nine. For epilepsy the Hydrochloride, $C_{23}H_{26}N_2O_4.HCl$ = 427·52 (430·746 I. Wts.), has been given as liquor, sam strength as Liquor Strychninæ, in 10 minim doses in creased until $\frac{1}{2}$ a grain is reached. **Brucine Sulphat** $(C_{23}H_{26}N_2O_4)_2.H_2SO_4$ = 880 (886·652 I. Wts.) + Aq. Whit crystals soluble 1 in 80 in water.

Bryonia. *Syn.*—Vitis alba; White Bryony.

Tinctura Bryoniæ, B.P.C.—From bruised fresh roots o *Bryonia alba* or *B. dioïca* (*Cucurbitaceæ*) a tincture is prepare corresponding in strength to 1 of dried root to 10 of alcoho (60%). *Dose*, 1 to 10 minims (0·06 to 0·6 Cc.) or more Useful in pleurisy. Relieves the pain and allays the cough In large doses it is an active cathartic, used for dropsy. I also checks metrorrhagia. The fresh plant applied to th skin will cause vesication. It contains a bitter principle cathartic and diuretic, soluble in water and alcohol.

Calumba (*Off.*). U.S. Dried root, sliced, of *Jateorhiz Calumba* (*Menispermaceæ*). Non-astringent tonic for simp

debility and indigestion. Can be given with Salts of Iron. Infusion 1 in 20 (cold water); Concentrated Infusion 1 in 2. Tincture 1 in 10 (U.S. 1 in 5). **Fluidextractum Calumbæ**, U.S., 1=1. Hydro-alcoholic percolate. *Dose*, 30 minims. Is represented in I. C. Add. by *Coscinium fenestratum* (false Calumba Root), *q.v.*

Cambogia (*Off.*), U.S., P. Austr. *Dose*, ½ to 2 grains. Yellow Gum Resin from *Garcinia Hanburii* (*Guttiferæ*) growing in Siam. A powerful purgative. May cause severe griping. Will expel tapeworm. Is rarely now given alone.

Capilli Veneris Herba, P. Belg. *Adianti Capilli Veneris* (L).—Entire plant. Syrup and fluid extract are P. Belg.

Carbonis Bisulphidum (*Off.*). *Syn.* Carbonei Disulphidum, U.S. CS_2=75·55 *Off.*, (76·12 I. Wts.) (75·57 U.S. Wts.). A clear liquid with characteristic odour, Sp. Gr. 1·268 to 1·269. Very slightly soluble in water, but readily in Alcohol, Ether and Chloroform and the fixed and volatile oils. Dissolves Phosphorus, Sulphur and Rubber with avidity. Is poisonous, but has been employed in treatment of phthisis.

Acute poisoning by, respirations very slow (about 12 per minute). Expiration deep, prolonged and blowing; heart not much affected, but pulse weak.—Amer. Med., May 27/05; J.A., 1906,12.

In tuberculosis, inhaled, has no disagreeable effects. Has strong action against the tubercle bacillus. Is a parasiticide and will cure tuberculosis.—M. Arch., 1904,362.

Cardamomi Semina (*Off.*). Dried ripe seeds of *Elettaria Cardamomum* (*Scitaminaceæ*). The seeds should be removed from their pericarps when required for use. Given in atonic dyspepsia. Contained in **Pulvis Aromaticus**, U.S. **Tinctura Cardamomi Composita** (*Off.*). *Dose*, ½ to 1 drachm. Cardamom Seeds 125, Caraway Fruit 125, Raisins freed from seeds 1,000, Cinnamon Bark bruised 250, Cochineal 63, Alcohol 60% 10,000. **Tincture**, U.S., 1 in 5 Alcohol (48·9% vol.). **Compound Tincture**, U.S. Cardamom 25, Saigon Cinnamon 25, Caraway 12, Cochineal 5, Glycerin 50, Alcohol (48·9% vol.) to 1,000. Compound Cardamoms Tincture is incompatible with Alkaloidal salts, Bismuth mixtures, Sodium Bromide.—P J.i./06,218.

Carduus Benedictus (*Compositæ*).—Blessed Thistle. Extract. Ph. Ned. P. Belg. In diarrhœa, malarial affections. Infusion, 1 in 20. *Dose*, 1 to 2 ounces.

Carui Oleum.—Caraway Oil. *Dose*, ½ to 3 minims. Distilled from fruits of Carum Carui (*Umbelliferæ*) Colourless or yellowish oil. Sp. Gr. 0·910 to 0·920. **Oleum Cari**, U.S. Sp. Gr. 0·905 to 0·915 at 25°C. Soluble in equal volume of Alcohol, and in 3 to 10 volumes of 80% Alcohol. Angle of rotation varies from + 76° to + 80° in 100 mm. tube at 25°C. **Carvonum**, P. Austr. A yellowish or colourless liquid prepared from the oil has Sp. Gr. 0·960—0·964. Soluble 1 in 2 diluted alcohol.

Caryophylli Oleum.—Clove Oil. (*Off.*) *Dose*, ½ to 3 minims. Colourless to brownish oil. Sp. Gr. not below 1·05. Distilled from the flower buds of *Eugenia Caryophyllata* (*Myrtaceæ*). U.S. specifies 80% Eugenol, *v.p.* 736. Assay

method given. Soluble in equal volume of alcohol. Aromatic carminative. Given with advantage both internally and injected hypodermically in phthisis.

Cascarilla (*Off.*). Dried bark of *Croton Eluteria* (*Euphorbiaceæ*), in quills 1 to 3 inches or more long, and about $\frac{1}{8}$ to $\frac{1}{2}$ inch in diameter, or in small curved pieces. Contains Resin and 0·5 to 3% Volatile Oil, also the bitter principle cascarillin (best extracted by Acetone—Naylor, Birmingham, P.J., July 28,06), together with resin and tannin. Aromatic tonic. **Infusum Cascarillæ** (*Off.*), 1 in boiling distilled water, 20. Infuse 15 minutes. **Tincture** (*Off.*), 1 in 5 Alcohol 70%. *Dose*, $\frac{1}{2}$ to 1 drachm.

Cassia Beareana. A native Ceylon remedy for fever, blackwater fever, and malaria.—L. i./02,282 ; i /03,190, 796.

A liquid extract, 1 in 1 is prepared. *Dose*, 30 to 60 minims, well diluted with water.

Cassiæ Oleum. *See* Cinnamomi Oleum.

Cassia Fistula, U.S. *Average dose*, 1 drachm (4 Gm.). Dried cylindrical brown fruit 20 mm. in diameter and 25 to 50 cm. long, and

Cassiæ Pulpa (*Off.*). *Dose*, 1 drachm to 2 ounces, from pods of *Cassia Fistula* Linné (*Leguminosæ*), are mild aperients.

Castor, P. Austr. Dried preputial follicles and secretions taken from the Beaver, *Castor Fiber* (*Rodentia*), in brown pieces. To contain not more than 40% insoluble in hot alcohol. Stimulant and antispasmodic. Is given in dysmenorrhœa as tincture 1 in 20. *Dose*, $\frac{1}{2}$ to 1 drachm, suspended in water, with Mucilage of Acacia. *See also* Mistura Morphinæ et Phenazoni Composita.

Catechu (*Off.*). *Syn.* Catechu Pallidum. Dried extract of leaves and young shoots of *Uncaria Gambier* (*Rubiaceæ*). Gambir, U.S., is the dried extract from *Ourouparia Gambir* (*Rubiaceæ*). Soluble in water to the extent of about 50%. Astringent in diarrhœa. *Dose*, 5 to 15 grains. **Pulvis Catechu Compositus** (*Off.*) contains Catechu 4, Kino 2, Krameria Root 2, Cinnamon Bark 1, Nutmeg 1. *Dose*, 10 to 40 grains ; Tincture 1 in 5, Alcohol 60% with Cinnamon 1 in 20. (Tinctura Gambir Composita, U.S.—*Average dose*, 1 drachm ; 1 in 20 Diluted Alcohol with Saigon Cinnamon 1 in 40.) **Trochiscus Catechu** (*Off.*) U.S., contains 1 grain. For relaxed throat.

Catechu Nigrum, *v. p.* xxiv.

Cereus (Cactus). Grandiflorus (*Night-blooming Cereus*). —Used in asthenic conditions of heart, and dropsy.—B.M.J. i./90,70. Liquid Extract (imported), 1=1. *Dose*, 1 to 10 minims. Tincture, fresh flowers and young stems 1, alcohol 4. *Dose*, 2 to 10, increased to 30 minims. A cardiac tonic, free from cumulative or narcotic action, most valuable in functional disorders, palpitation in dyspepsia and Graves' disease, and the milder forms of angina.

A favourite heart medicine,—has no injurious effect on general system.—P.J. i./05,304.

Pillets, a specialty recommended as a cardiac tonic, are said to contain $\frac{1}{100}$ grain Cactina, obtained from *Cactus mexicana*,

Botanical description, cardiac action doubtful.—P.J. ii./97,174, 539,574.

Considered superior to Digitalis. Does not irritate the stomach, is non-cumulative, increases muscular motor energy, raises arterial tension, and strengthens pulse.—Med. Rec., June 3, 1905.

Cetaceum, Spermaceti (*Off.*). White unctuous crystalline substance obtained from the sperm whale, *Physeter Macrocephalus* (principally from the head of the animal). Consists chiefly of Cetyl Palmitate, $C_{15}H_{31}CO.OC_{16}H_{33}$ = 476·83 (480·512 I. Wts). Soluble in chloroform 1 in 1¼ and in Ether about 1 in 7. Is contained in Cold Cream, *q.v.* **Unguentum Cetacei** (*Off.*). Melt Spermaceti 5, with White Wax 2, and Almond Oil 18 (by weight), add Benzoin ½, stir and continue heating two hours. Strain and stir until cold. Cetaceum injected warm (40°C.) the night before the operation on thin-walled cysts, after tapping and washing out with warm water.—B.M.J. i./06,154. More suitable as an addition to theobroma suppository mass than wax, which should not be used beyond 10% addition.—C.D. ii./04,498.

Æthol or **Æthal**.—Cetyl-Alcohol, $C_{16}H_{33}OH$ = 240·44 (242·272 I. Wts.), in crystals from Spermaceti. Is recommended for dermatological use, rubbed on the skin it becomes unctuous; is mixed with boric acid, under the name of *Borsyl*.—P.J. ii./99,344b; ii./00,586.

Cera Alba (*Off.*) is Yellow Wax (*Cera Flava*) from the honeycomb of *Apis Mellifica* (*Hymenoptera*). Bleached by exposure to moisture, air and light.

Cetraria Islandica (*Discomycetes* or *Discolichenes*), **Iceland Moss**, was at one time used as a "Throat remedy," in form of decoction, jelly, or lozenge, and was Official in the British Pharmacopœia 1885; it might well find a place in some of the Throat Pharmacopœias. The moss contains Cetrarin 3%, Lichenin, $C_{12}H_{20}O_{10}$ = 321·72 (324·16 I. Wts.) 45%, Amylaceous Fibrin 36%, Gum 4%, Non-crystallisable Sugar 4%, Water and Salts (inorganic) 8%. Lichenin is a starch-like body which has been shown to consist of two elements soluble in hot water,—one of which is also soluble in cold water. The bitter tonic principle Cetrarin $C_{18}H_{16}O_8$ (Schmidt)=357·42 (360·128 I. Wts.) is extracted by hot water, and gives the characteristic taste to the decoction. *Dose*, 2 to 4 grains. A white micro-crystalline powder, soluble in alcohol, slightly so in water and ether. Recommended as a bitter tonic and laxative in constipation of chlorosis and anæmia. **Lichenoids** composed of Iceland Moss lubricate and soothe the mucous membrane of the throat. They are intended to be slowly dissolved in the mouth, and are suitable in inflammatory and excitable states of fauces and oropharynx, especially to speakers who suffer with dry mouth and throat. As a sialogogue they are excellent correctives in pyrosis.—B.M.J. i./06,629.

Cetraria Islandica contains proto-α-lichesteric acid. Full study of all lichens and their constituents.—J.C.S.A., Vol. i./06,280.

Chailletia toxicaria (Doa).—Growing in West Africa

and South America; a violent poison, has cumulative action; repeated harmless doses prove fatal, by paralysis of spinal nerves, beginning with lower limbs, delirium and convulsions. Natives use it for murder.—C. D. i./06,737; L. i./06,1549.

Chekan.—The leaves of *Myrtus Chekan*. Are aromatic and expectorant; are used in chronic coughs and bronchitis. *Dose*, of fluid extract, ½ to 3 drachms.

Chelidonium Majus.—Greater Celandine.—The yellow milky juice is an old remedy for warts and opacities of the cornea. The freshly-expressed juice preserved by ½% by volume of chloroform has been much used as a remedy for cancer, given internally in dose of 10 to 60 minims, and in some cases with striking results. A fluid extract (*Dose*, 10 to 30 minims) from the dried plant is used for parenchymatous injection into diseased tissue, and, diluted, as a lotion. An alkaloid, Chelidonine, $C_{20}H_{19}NO_5,H_2O = 368{\cdot}42$ (371·208 I. Wts.), has been isolated, melting at 135° C., forming a Hydrochloride, $C_{20}H_{19}NO_5HCl = 386{\cdot}73$ (389·65 I. Wts.) and a Sulphate $(C_{20}H_{19}NO_5)_2H_2SO_4 = 798{\cdot}42$ (804·46 I. Wts.) in minute yellowish granular crystals; have been used as morphine substitutes in cancer. *Dose*, 3 grains twice a day.—P.J. ii./01,317,361.

Chenopodium Anthelmintum, Linné (*Chenopodiaceæ*). Contains a Volatile Oil, Official in U.S. *Average dose*, 3 minims. For round worms, 10 minims on sugar or in emulsion.

Chimaphila.—U.S. **Pipsissewa.** *Average dose*, 30 grains (2 Gm.). Dried leaves of *Chimaphila umbellata* (*Ericaceæ*). **Fluidextract**, U.S., Hydro-alcoholic percolate 1=1. *Dose*, 30 minims (1·8 Cc.). A stimulating diuretic in cardiac and hepatic dropsy.

Chirata.—*Swertia Chirata* (*Gentianaceæ*). Entire plant. Bitter tonic without Tannic Acid given in indigestion for anorexia and torpid liver with constipation. *Dose* of powder, 20 grains. **Fluidextract**, U.S. *Average dose*, 15 minims. **Tincture** (*Off.*) ½ to 1 drachm. **Infusion** (*Off.*) 1 in 20. *Dose*, ½ to 1 ounce.

Chondrus Crispus (*Gigartinaceæ*), U.S. Irish Moss. **Carrageen, Ph. Ned., P. Belg.** Employed as decoction, Moss ½ ounce, Water 1½ pints, boiled down to 1 pint. Flavoured with a little sugar and lemon juice. Demulcent and nutritive.

Cicuta Virosa (*Umbelliferæ*), Water Hemlock, Cowbane, or Wild Parsley. Contains Cicutoxin, a substance giving rise to convulsions by action on the spinal medulla.

Citronellæ Oleum (Genuine from Ceylon Government) gave the following figures:—Sp. Gr. at 15·5°C, 0·884. Optical rotation −3·3, Citronellal 36%, Geraniol 41%. Schimmel's Test, Turbid solution.—C. D. i./06,355

Cochlearia Armoracia, fresh Horseradish Root. Sialogogue, stomachic, and slightly diaphoretic. Yields pungent volatile oil on moistening or rasping. Used in the form of **Spiritus Armoraciæ Compositus** (*Off.*).

Collinsonia Canadensis.—The root of this, commonly known as stone-root or knob-root, Heal-all, Hardhack, in

America, has been employed in gravel and other urinary affections. Is an antispasmodic in flatulent, infantile, and biliary colic, and locally in lax conditions of the uvula, pharynx, and vocal cords. Tincture, 1 in 10 of alcohol 60%. *Dose*, ½ to 2 drachms. Liquid Extract, 1 in 1. *Dose*, 15 minims to 1 drachm. Suppositories containing 20 to 30 grains of the powder are also used. Has also been employed in cancer of stomach and cystitis. Under the name **Helalin**, Liquid Extracts are prepared containing, in addition, Cascara, and Pepsin as hepatic stimulants. *Dose* of each 1 drachm.

Coriandri Fructus.—*Dose*, 20 to 60 grains (1·3 to 4 Gm.). Dried ripe fruit, *Coriandrum sativum* (*Umbelliferæ*). Aromatic and carminative. **Oleum Coriandri.**—*Dose*, ½ to 3 minims (0·03 to 0·18 Cc.). Is contained in official preparations of rhubarb and senna to prevent griping.

Coronilla varia.—An aqueous extract of the leaves and flowering tops is used as a remedy in many cardiac affections. It possesses the great advantage over digitalis and strophanthus that it does not derange the digestive functions. *Dose of extract* is 1½ grains (0·1 Gm.) three or four times daily.—P.J. ii./98,661. The active principle Coronilline lessens frequency of the pulse, kills by cardiac paralysis.—B.M.J.E. ii./98,55. Tincture 1 in 8, by percolation. *Dose*, 30 to 60 minims.

Corydalis cava or **C. tuberosa.** — HOLLOW-ROOTED FUMITORY.—The root, known as *Radix Aristolochiæ*, possesses antiperiodic properties, and has been given as an emmenagogue and anthelmintic, as well as in syphilitic, scrofulous, and cutaneous affections, in dose of 10 to 30 grains. The bases Corydaline $C_{22}H_{27}NO_4$=366·48 (369·256 I. Wts.), Bulbocapnine $C_{19}H_{19}NO_4$=322·75 (325·192 I. Wts.), Corycavine $C_{23}H_{23}NO_6$ = 406·15 (409·224 I. Wts.), Corybulbine $C_{21}H_{25}NO_4$=352·57 (355·24 I. Wts.), Corytuberine $C_{19}H_{25}NO_4$=328·75 (331·24 I. Wts.), and Corydine have been obtained from the root. Berichte, 25,2411; P.J. i./97,465, *ex Proc. Chem. Soc.*, 179, 101; Archiv. 1898,236. Five other alkaloids have since been isolated by Gadamer.—C.D. ii./01,632.

Crocus, Saffron (*Off.*). The dried stigmas and tops of the styles of *Crocus sativus* (*Iridaceæ*) Linn. Moisture not more than 12·5%, Ash 7%. Every filament should give a blue colour on placing in Sulphuric Acid.—Mann. It is a curious old delusion that saffron tends to bring out the rash of measles.

Cydoniæ Semina (*Rosaceæ*), from Abyssinia, Persia, and Central Europe. The ripe seeds contain Cydonin and Amygdalin. *Use.*—Forms a demulcent mucilage.

Cynoglossum officinale (*Boraginaceæ*), Hound's-tongue. The root. Demulcent and sedative for coughs, tends to check diarrhœa and dysentery.

Cypripedium, U.S.—*Dose*, 15 grains. Dried rhizome and roots of *C. hirsutum* and *C. parviflorum* (*Orchidaceæ*). In nervous affections, hysteria, hypochondriasis, and epilepsy. **Cypripedin.**—*Dose*, 1 to 3 grains. The dried extract of *Cypripedium pubescens*, Ladies' Slipper.

Cytisine, $C_{11}H_{14}N_2O$=188·77 (190·192 I. Wts.). *Syn.* Ulexine. Is an alkaloid obtained from *Cytisus Laburnum*. It is

also present in *Ulex europæus*—the common furze. Cytisine Hydrobromide, a freely soluble salt, *dose*, $\frac{1}{60}$ to $\frac{1}{2}$ grain, has diuretic properties. It benumbs the tongue. Latest compounds from cytisine.—J.C.S.A., Vol. i./06, 302.

Drosera rotundifolia.—The leaves of Sundew. Have been recommended for chronic bronchitis, asthma, whooping-cough, and to ease the cough of phthisis. Tincture, 1 in 10 of proof spirit. *Dose*, 5 to 10 minims.

Echinacea Augustifolia, "Black Sampson." The root, powdered, is given in doses of 10 to 30 grains for strumous and syphilitic ailments, to promote the healing of ulcers, and is employed in blood-poisoning in all its forms. In these it is a powerful stimulant to the nerve centres. Also in uræmia.—M.A. 1906,16. In the bites of snakes and insect stings the freshly scraped root is applied.

Equisetum Arvense, P. Austr. 'Cat's Tail.' The sterile shoots contain Equisetic Acid, said to be identical with Aconitic Acid.

Erigeron Canadense.—Fleabane. The oil distilled from this herb is official in U.S. *Dose*, 5 to 30 minims. Capsules contain 5 minims, and a Liquid Extract of the leaves is prepared. *Dose*, 30 to 60 minims. The plant has astringent and hæmostatic properties, especially in uterine, urinary and nephritic affections, dysuria, strangury, also used in hæmoptysis and epistaxis.

Eugenol. U.S.—Eugenic Acid, $C_{10}H_{12}O_2$ or $C_6H_3(OH).(OCH_3).C_3H_5$, 4 : 3 : 1 = 162·86 (Off. and U.S. Wts.); (164·096 I. Wts.).—A colourless oily liquid (B.Pt. 251° to 253°C.), darkening on exposure, obtained as an oxidation product of oil of cloves. It has a strong clove odour, and is a powerful antiseptic and antiputrescent. Is employed by dentists. Caused reduced sensibility of mucous membrane, but not complete anæsthesia. Useful with wool fat in eczema.—Th. Gaz. May 1889,344. Is also in P. Austr. with Sp. Gr. 1·072–1·074. Acetamide of Eugenol; crystalline, non-caustic and antiseptic; has been used as a local anæsthetic.—L. ii./92,1350.

Eumenol is said to be the fluid extract of a Chinese root, Tang-kui, is given to check profuse menstruation; contains a volatile oil. *Dose*, one drachm three times a day, before the periods.—B.M.J.E. ii./01,68.

Eupatorium, U.S. *Average dose*, 30 grains (2 Gm.). Dried leaves and flowering tops of *Eupatorium perfoliatum* (*Compositæ*) Linné. Tonic and diaphoretic; in large doses, emetic and aperient. Employed in dyspepsia, and the infusion (1 in 20. *Dose*, 1 to 4 ounces or more) has been given for tapeworm. **Fluidextract**, U.S., 1 = 1. *Dose*, 30 minims.

Fœniculi Fructus (*Off.*). Fennel. Dried ripe fruit of *Fœniculum Capillaceum*, *Umbelliferæ* (cultivated) (U.S. *F. vulgare*), contains Volatile Oil. *Dose*, 5 to 15 minims (0·30 Cc. to 0·9 Cc.). (U.S. average 3 minims.) Sp. Gr. not below 0·960. Constituent anethol, aromatic. Given to infants in form of **Aqua Fœniculi** (*Off.*) (1 in 10) in the same manner as Dill Water.

Galbanum (*Off.*). *Dose*, 5 to 15 grains (0·32 to 1 Gm.)

Gum resin from *Ferula Galbaniflua* (*Umbelliferæ*) and other species. Expectorant and stimulant. **Pilula Galbani Composita** (*Off.*). *Dose*, 4 to 8 grains (0·26 to 0·52 Gm.). Galbanum 1, Asafetida 1, Myrrh 1, Syrup of Glucose *q.s.* If kaolin be substituted for the glucose, powdering the myrrh, mixing the kaolin with the galbanum and asafetida, a good mass is produced.—C.D.ii./05,953.

Galium Aparine.—The plant Cleavers or Goose Grass. Is acid, astringent, and diuretic. Has been used in dropsy, jaundice, scrofulous scaly eruptions, epilepsy, and obesity. Succus Galii, *dose*, 1 to 2 drachms; and Extractum Galii, 5 to 20 grains. For psoriasis.

Galla (*Off.*), U.S. *Dose*, 7½ grains. Excrescences on *Quercus infectoria* (*Cupuliferæ*), caused by deposition of eggs of *Cynips Gallæ Tinctoriæ* (*Hymenoptera*). Astringent. Contain Tannic and Gallic Acids. **Unguentum Gallæ** (*Off.*), 1 to 4 Benzoated Lard.

Gentianæ Radix (*Off.*), U.S.—Dried rhizome and roots of *Gentiana Lutea* (*Gentianaceæ*). A bitter tonic. Yields 30 to 40% of Aqueous Extractive.—P.J. ii./04,475. This is largely used as a pill excipient.

Infusum Gentianæ Compositum (*Off.*). *Dose*, ½ to 1 ounce. Gentian Root 12½, Bitter Orange Peel cut small 12½, Fresh Lemon Peel, cut small, 25, Distilled Water boiling 1,000. For dispensing purposes it is convenient to fill strong half-pint bottles, plug the necks well with cotton wool, stand in suitable pan and heat to boiling point 10 minutes and allow to cool. So prepared, will keep for a week and more, and the flavour is not impaired by over-heating. **Infusum Gentianæ Aromaticum.** Brompton H. Gentian Root 2 ounces, Lemon Peel 6 drachms, Orange Peel 3 drachms, Boiling Water 1 gallon. **Tinctura Amara.** P.G. I.v. Gentian Root 3, Centaury Root 3, Orange Peel 2, Orange Berries 1, Zedoary Root 1, Diluted Alcohol (67 to 69% volume) to 50. **Mistura Gentianæ Alkalina.** Brompton H. Sodium Bicarbonate 15 grains, Dilute Hydrocyanic Acid 3 minims, Aromatic Gentian Infusion to 1 ounce. **Fluidextractum Gentianæ U.S.** 1=1 by Diluted Alcohol. *Dose*, 15 minims (0·9 Cc.).

Geranium Maculatum (*Geraniaceæ*), U.S.—Cranesbill root, is a powerful astringent; contains about 16% of tannin; used in diarrhœa, and locally in relaxed conditions of the mucous membranes. Geranin, a dried extract, is given in dose of 1 to 5 grains. Fluidextract, U.S., 1=1 Glycero-alcoholic percolate. *Average dose*, 15 minims.

Glaucium Luteum.—Yellow-horned or Sea Poppy. 1 drachm of Liquid Extract in glycosuria gave good results. Hæmoglobin and red corpuscles increased considerably.—P.J. i./99,91; i./00,222. The alkaloids Glaucine, Protopine, $C_{20}H_{17}NO_5 = 348{\cdot}54$ (351·176 I. Wts.), and Chelerythrine, $C_{21}H_{17}NO_4 = 341{\cdot}57$ (347·176 I. Wts.), are present.—Y.B.P. 1902,86.

Glycogen $[C_6H_{10}O_5]_n$.—A body allied to starch. *Dose*, 1½ to 2 grains (0·1 to 0·15 Gm.) It occurs in the liver, blood, horseflesh, etc. It is said to be changed at death into glucose, maltose, and isomaltose; said to improve nutrition—L.ii./03,345.

Gnaphalii Flos, P. Belg. (*Antennaria Dioica*, L.). White or purple flowers. Is used as poultice, and given in diarrhœa.

Gokhru.—The prickly fruit of Pedalium Murex. A remedy for nocturnal seminal emissions, incontinence of urine and impotence. Is rich in mucilage. An infusion 1 in 10 of boiling water (stand 2 hours). Half a pint is a daily dose. Should be freshly made.

Gugul. This name is somewhat loosely applied in the Bombay market to the product of *Boswellia serrata* and of the Indian Balsamodendrons—the latter, however, being distinguished as Mhaisa-gugul. The gugul tree, *B. serrata*, is common in Khandesh, Loonawara and other neighbouring territories. It resembles in appearance dried Canada Balsam, but has an odour nearer to Olibanum. It is not a regular article of commerce, being consumed in North and Central India. *Vide* Dymock's "Materia Medica of India."

Hibiscus Sabdariffa. The calyces, red and succulent, of this malvaceous herb are slightly purging. It is used in the East Indies in dyspepsia, dysuria, and strangury. An infusion is official in Pb. Mex. Acidity largely due to Tartaric and Malic acids. Used to form jellies, jams, and to dry like tamarinds.

Hæmol and Hæmogallol.—These two products of the reduction of the colouring matter of the blood are used for chlorosis, and are said to be more easily converted into blood colouring matter than other ferruginous preparations. The former, a blackish powder, is obtained by the action of zinc, and the latter, a reddish brown powder, by means of pyrogallol. *Dose* of each, 2 to 8 grains in cachet, thrice daily. **Arsen-Hæmol.**—Hæmol with 1% of arsenic; tonic and hæmatinic in anæmia. *Dose*, 1½ grains thrice daily in pills, gradually increased to 10 pills daily. **Bromo-Hæmol.** *Dose*, 30 grains twice or thrice daily in cachets. Combines tonic and sedative action.

Halviva.—KREAT-HALVIVA. *Dose*, 5 to 30 minims. A liquid sold as a nostrum, prepared from Kreat, or Kariyat, an Indian plant. This name is in India applied to two plants, *Ophelia Chirata* and *Andrographis paniculata*. Has been recommended as a tonic and substitute for quinine, in malaria and debility.—B.M.J. i./91,520,669,1004; P.J. 1891, 837,1120; C.D. i./92,614; L. ii./00,327.

Heliotropin, $C_6H_3\left(\begin{matrix}O\\O\end{matrix}\!\!>CH_2\right)COH$ = 148·92 (150·048 I. Wts.). *Syn.* Piperonal, a Methylene derivative of Protocatechuic Aldehyde, when pure is in shining white flaky crystals with Coumarin odour, slightly soluble in water, freely in alcohol, much used in perfumery.

Helonias dioica.—False Unicorn Root. Is used in colic and in atony of the generative organs; also employed as an abortifacient.

Hemidesmi Radix.—Dried root of *Hemidesmus Indicus* (*Asclepiadaceæ*). Indian Sarsaparilla. Was known as *Smilax aspera*. Infusion 1 in 10. Employed in kidney affections.

Herniaria glabra and **H. hirsuta** (*Caryophyllaceæ*). P. Austr. Contain Saponin, Methyl-umbelliferone herniarin),

and a minute amount of the alkaloid paronychine. Employed in bladder affections.

Hydrocotyle asiatica, Ph. Ned. Water Pennywort. This umbelliferous herb is used in India for specific skin diseases, scaly eruptions, and ozœna as an alterative and diuretic, in 4 to 10 grain doses internally; is added to lard as an ointment, also to poultices, and used as snuff in ozœna. Contains 15% of a volatile aromatic oil named Vellarine.

Hydroxylamine, $NH_2OH = 32{\cdot}82$ (33·064 I. Wts.), is formed by the action of nascent hydrogen on nitric acid. It is supplied in solution. Its strong reducing properties suggested its use in tinea and psoriasis. It is a strong antiseptic. Does not stain the skin. The **Hydrochloride,** $NH_2OH.HCl = 69{\cdot}01$ (69·522 I. Wts.), is in large hygroscopic crystals, with an acid taste and reaction, freely soluble in water. Solution 1 in 1,000 of equal parts of glycerin and alcohol or ointment with adeps lanæ, successful in lupus, ringworm, and parasitic sycosis. The first few applications (by friction) do not produce smarting, but later ones may.—B. M. J. i./03,545.

Inula Helenium (*Compositæ.*).—Elecampane. Root contains Inulin allied to Starch, and Helenin. *Dose*, ¼ to 2 grains (0·05 to 0·13 Gm.) a stearoptene, in white acicular crystals, insoluble in water, but freely so in alcohol. Is antiseptic, used in ozœna, keeps off insects, and internally for phthisis, malarial fevers, infantile and catarrhal diarrhœa; checks bronchial secretion. **Inulin**, from this and from Dahlias and Helianthus the same.—P. J. ii./04,335. **Extractum Inulæ Liquidum.** 1=1. *Dose*, 10 to 60 minims. **Extractum Helenii** (solid) is official in **Ph. Ned.**

Juglandin.—An extractive prepared from the inner bark of the root of *Juglans cinerea*, the butter-nut; is an hepatic stimulant and cathartic. *Dose*, 2 to 5 grains in pill. **Spiritus Nucis Juglandis,** distilled from *Juglans regia*, the walnut, is an antispasmodic and for checking sickness of pregnancy. *Dose*, 1 to 4 drachms. **Folia Juglandis** are in P. Austr.; also in P. Belg. (and Fluid Extract).

Juniperi Oleum (*Off.*), U.S. Oil distilled from fruit of *Juniperus Communis* (*Coniferæ*). Sp. Gr. 0·865 to 0·890 at 15·5° C. Soluble in four times its volume of a mixture of equal parts of absolute alcohol and alcohol 90%. **Spiritus** (*Off.*) U.S. 1 in 20. *Dose*, 20 to 60 minims. **Spiritus Juniperi Compositus,** U.S. *Average dose*, 2 drachms. Oil of Juniper 8, Oil of Caraway 1, Oil of Fennel 1, Alcohol (U.S.) 1,400, Water to 2,000. **Rob Juniperi, Ph. Ned.** Juniper Berries 3, Water 9. Infuse 12 hours, and solve Sugar 10. Evaporate to honey consistence.

Kauri Gum. A resin obtained from *Dammara Australis* in Australia and New Zealand. **Dental Compo.** Contains Kauri Gum. This is used for taking impressions of the mouth and teeth for plate preparation. *Directions.*—Place the cake of Compo in moderately warm water for about two minutes or so to soften—do not employ boiling water. The Compo should be kneaded with the wet fingers until it has hardened somewhat; by this proceeding the

Compo becomes almost cool. The Tray should be warmed for a short time before placing the Compo into it. The surface of the Compo is then smoothened with the hand, a little vaseline is rubbed on the surface, and the tray is held for a second or two over a Bunsen flame. It is very important that the surface of the Compo should be heated in this way before inserting into the mouth. After inserting wait for 20 or 30 seconds. On removal, place the tray bearing the impression in cold water.

Kava-Kava. I.C. Add. — Root of *Piper methysticum* (*Piperaceæ*), from the Polynesian Islands. Is used by natives as a sialogogue and to make a fermented drink. Contains an essential oil, two resins, and about 1% of a neutral crystalline principle, Kavalin or Methysticin, $C_{16}H_{18}O_5$ = 287·96 (290·144 I. Wts.), allied to Piperin and Yangonine, melting at 156°, $C_{10}H_8O_3$ = 174·74 (176·064 I. Wts.). — C.D. ii./05,1052. Is a bitter tonic, with agreeable taste, stimulates the nervous system, and is diuretic. Has been found useful for gonorrhœa, gout, and cystitis. Extract, hydro-alcoholic. *Dose*, 5 to 10 grains. Liquid Extract, 1 in 1, of alcohols 90 and 45%. *Dose*, 30 to 60 minims. Pill = 3 grains extract. *Dose*, 1 to 3 or 4. Infusion, 1 in 320. *Dose*, ½ pint. Though more palatable than, is not equal to copaiba or santal oil. Is a local anæsthetic to tongue and eye.

Koromiko.—These herbs, *Veronica salicifolia* and *V. parviflora*, imported from New Zealand, are used there and in China as a remedy for chronic dysentery and diarrhœa. Tincture, 1 in 5 of proof spirit. *Dose*, ½ to 1 drachm.

Kô-sam Seeds (*Brucea Sumatrana*, Roxb.).—An East Indies drug. It has recently been brought prominently to notice on account of its reputed value in the treatment of tropical dysentery. The seeds yield a large amount of fatty oil and two bitter principles.—Y. B. P. 1903,503-522, but no alkaloid. *See also* Brucea.

Lachnanthes tinctoria.—Spirit Weed, Red Root. A tincture = 1 in 10 of proof spirit of this United States plant; is used to check the cough in phthisis. *Dose*, 1 to 10 minims. B.M.J. ii./95,1470; L.ii./01,1604. References to Alabone's treatment by lachnanthes. — B.M.J.ii./01,747,912,1124,1868; i./02,101,113. Dr. Latham's report on.—B.M.J. ii./02,143; L.ii./02, 72,88.

Lactose.—**Saccharum Lactis**, $C_{12}H_{22}O_{11},H_2O$ = 357·48 (360·192 I. Wts.). (*Off.*). Milk Sugar. *Dose, ad lib.* Used for weakly children. Is said to be a useful addition to Magnesia as a laxative, it increases the solubility of the latter by combination. It is prepared from the whey of milk.

Lappa, U.S. Burdock. Roots of *Arctium Lappa*, Linné, or other species of Arctium. **Fluidextractum Lappæ**, U.S., 1=1 by Diluted Alcohol. *Average dose*, 30 minims. In skin affections and gout.

Lauri Fructus.—*Laurus nobilis* (*Lauraceæ*). The ripe fruit contains fixed and volatile oil. Bayberry Oil is employed in rheumatic and similar pains. Crystalline Lauric Acid is obtainable from the Oil.

Lavandulæ Florum Oleum (*Off.*). Volatile oil from

Lavandula vera (*Labiatæ*), *L. officinalis* U.S., Sp. Gr. not below 0·885 at 15·5°C. Soluble in three parts of 70% Alcohol. Shaken with water in a narrow graduated cylinder, volume of oil should not be diminished (absence of alcohol) (U.S.). **Spiritus Lavandulæ** (*Off.*), 1 in 10; U.S. 1 in 20. **Tinctura Lavandulæ Composita** (*Off.*) *Dose*, ½ to 1 drachm. Lavender Oil 45 minims, Rosemary Oil 5 minims, Cinnamon 75 grains, Nutmeg 75 grains, Red Sanders Wood 150 grains, Alcohol 90% 20 ounces.

Leptandrin.—*Dose*, ¼ to 2 grains. A resinoid powder obtained from Culvers Root, *Leptandra Virginica*, U.S. *Veronica Virginica* (*Scrophulariaceæ*). It promotes the flow of bile without irritating the bowels; useful in dyspepsia. Acts well with podophyllin. **Fluidextractum**, U.S. 1=1 of Leptandra by diluted alcohol. *Average dose*, 15 minims. Solid Extract (Powder form, 1=4 of drug) by concentrating same and adding Glycyrrhiza. *Average dose*, 4 grains.

Levisticum officinale.—Lovage. A decoction in milk (a fresh leaf and stalk to a quart), allowed to simmer 2 hours. *Dose*, 3 to 5 ounces. For renal dropsy.

Linum (*Off.*). Seeds of *Linum usitatissimum* (*Linaceæ*). Decoction, 1 in 20, demulcent or crushed for use as a poultice. Contains Linseed Oil. Used as enema, or with lime-water as Carron Oil, *q.v.* **Flax Seed** in habitual constipation. One teaspoonful to be taken floating in a tumbler of water before breakfast.—Med. Press, Nov. 23, 1904.

Lobelia (*Off.*), U.S., P. Belg. Dried flowering herb of *Lobelia inflata* (*Lobeliaceæ*). Is purgative and emetic, but its only use is to relax spasm of the bronchi in asthma and bronchitis. Contained in many antiasthmatic powders (*vide* Pulvis Lobeliæ Composita). **Fluidextract**, U.S., 1 = 1. An Acetic extractive. *Average dose*, 8 minims (0·5 Cc.). **Tincture**, U.S., 1 in 10 alcohol (48·9% vol.). *Average dose*, Expectorant 15 minims, Emetic 1 drachm. C. U. D. proposes 1 in 10 Alcohol 70%. **Tinctura Lobeliæ Ætherea** (*Off.*). 1 in 5 of Spirit of Ether. *Dose*, 5 to 15 minims until nausea occurs. In atonic constipation with dryness of the fæces, the tincture in 10 minim doses combined with cascara useful.—H.

Lycoperdon giganteum.—Puff Ball. This forms a soft and comfortable surgical dressing. The dusty powder is a powerful hæmostatic.—Whitla.

Maidis Stigmata.—*Syn.* Corn Silk. The thread-like stigmata of nearly ripe Maize fruit. The fresh are official in U.S. Are demulcent and diuretic. Used in cystitis, and nocturnal incontinence of urine. Liquid extract, *dose*, 1 drachm. Infuse corn silk 1,000 twice with water *q.s.* to cover. Evaporate liquor to 400. Cover and add cold water 300, allow to deposit, filter and evaporate to soft extract. Of this 1, with water 10, gives a clear solution. A *Syrup* may be made of Liquid Extract 1, simple Syrup to 10.

Maisine, an albuminoid substance extracted from maize. Is used to make capsules which will not dissolve except in the intestines.

Maidis Ustilago.—Maize Ergot, Corn Ergot. Is used in parturition in place of ergot. Is said to increase the force with-

out increasing the duration of uterine contractions. *Dose*, 15 to 60 grains, Fluid Extract, ½ to 2 drachms.—Pr. xl.215.

Manna, U.S. *Average dose*, ½ ounce. Saccharine exudation from *Fraxinus Ornus*, Linné (*Oleaceæ*), and other species. In flattish, somewhat three-edged pieces. Soluble in Water about 1 in 3; slightly in Alcohol 90%. Contains Mannitol (a non-fermentable sugar which does not reduce Fehling's Solution), $C_6H_8(OH)_6 = 180{\cdot}74$ (182·112 I. Wts.), to extent of 75%, and Dextrin about 20%. Has mild laxative properties.

Marrubium, U.S. — Horehound. Dried leaves and flowering tops of *Marrubium Vulgare*, Linné (*Labiatæ*). *Average dose*, 30 grains. Given in lung affections—has tonic properties. Infusion 1 in 20 of boiling water.

Mastich (P. Belg.), yellow brittle resinous tears obtained from *Pistacia lentiscus* (*Anacardiaceæ*); insoluble in Water, but partly in Alcohol 90%; also soluble in Ether 2 in 1 and in Chloroform 2 in 1. **Alcohol Mastichi**, R.D.H.—Mastich 2, Alcohol 90% 1; dissolve. Harvard Liquid is similar; this is employed for covering a cottonwool dressing so as to form a temporary covering, *e.g.*, during the treatment of dental canals with an antiseptic such as Lysoform. **Æther Copal**, R.D.H. (Copal Solution).—Copal 1, Ether 1; dissolve. Copal is a resinous body obtained from *Vateria indica* (*Dipterocarpeæ*), Indian; the Brazilian is from *Hymenæa* species and other plants. **Microscopic Varnish.**—Mastich ½ ounce, Caoutchouc 15 grains, Chloroform 2 ounces; macerate and filter. Mastix is official in P. Belg.

Matico, U.S.—Leaves of *Piper Angustifolium* (*Piperaceæ*). *Average dose*, 60 grains. Has long been said to have styptic powers if applied locally to a bleeding surface (Ruspini's Styptic). Given internally has proved useful in gonorrhœa, cystitis, and leucorrhœa. Fluidextractum Matico, U.S., 1 = 1 Hydro-alcoholic. *Average dose*, 1 drachm.

Mel Depuratum (*Off.*). The honey of commerce melted on a water bath and strained hot. Is demulcent, laxative and nutritive. *Oxymel* (*q.v.*), is a frequent ingredient in cough mixtures.

Melaleuca Viridiflora (*Myrtaceæ*).—Indigenous to New Caledonia. **Gomenol**, a French proprietary, is stated to be a distilled essence of; given in rhinitis, laryngitis, and other diseases of the respiratory system. **Pâtes Pectorales au Gomenol** are also made. In influenza, bronchitis, and coryza.

Menispermin.—*Dose*, 1 to 5 grains. The powdered extractive from species of *Menispermum*. A tonic laxative, diuretic, stimulant; useful in indigestion.

Menyanthes trifoliata. *Syn.* Trifolia Fibrinà, P.G.—Bogbean Leaves or Buckbean. Are bitter tonic, emmenagogue, antiscorbutic, vermifuge and febrifuge; large doses are purgative and emetic; contain Menyanthin, $C_{30}H_{46}O_{41} = 625{\cdot}62$ (630·368 I.Wts.), a glucoside. Infusion 1 in 20. *Dose*, 2 to 6 ounces, taken hot, early in the morning daily, useful for functional amenorrhœa.—L. i./85,132, 235. Liquid Extract with Liquorice, 1 in 2. *Dose*, ½ ounce.

Mezereum, U.S. *Average dose*, 7½ grains. Dried bark of *Daphne Mezereum* (*Thymelaceæ*) and other European species. Fluidextract, U.S., is 1 = 1 Hydro-alcoholic. Contains a crystallisable substance (Daphnetin), which is isomeric with Æsculin (*q.v.*). Has been used as an epispastic for many years past, and stimulant.

Monsonia ovata or biflora.—A South African plant used as a native remedy for dysentery. Tincture, 1 in 8, Alcohol (90%). *Dose*, 1 to 4 drachms every 3 or 4 hours.—L. i./97, 368, 433; Y.B. 1898, 99, 426, 485; P.J. i./97, 162, 450; M.C., April, 97, 63. *Monsonia Burkei* (or *biflora*) preferred, and *Pelargonium tuberosa* also recommended for dysentery.—L. ii./98, 127; ii./99, 1826. Useful in anthrax.—P.J. i./01, 106.

Mori Succus.—Mulberry Juice. *Dose*, 1 drachm. The juice of the fruit of *Morus nigra* (*Moraceæ*). Mild laxative. Used in the form of **Syrupus Mori.** Mulberry juice 20, heat to boiling point and filter. Dissolve sugar 36 in filtrate and add Alcohol 90% 2½ to the liquid

Moringa pterygosperma (Gaertner) (*Capparidaceæ*) from Senegal. A tincture made from the root is diuretic and given for renal dropsy. The Gum is also used in commerce for making varnish.—N.S.D.

Moschus (*Off.*), **Ph. Ned.** Musk. *Dose*, 5 to 10 grains (0·32 to 0·65 Gm.). The dried secretion from the preputial follicles of the musk deer, *Moschus Moschiferus* (*Ungulata*). That known as Grain Musk is Official. A useful nerve stimulant in cases of exhaustion in fevers and blood poisoning. (West London Med. Jl. ix, 20.) Of value both for nervous excitement or nervous collapse. Is effective in obstinate hiccough and infantile convulsions. **Mistura Moschi.**—Musk 5 grains, Gum Acacia 5 grains, Syrup of Orange 1 drachm, Rose Water to 1 ounce. **Tincture, U.S.**—1 in 20 Alcohol 50% approximately. *Average dose*, 1 drachm. A Tincture of Artificial Musk has been used in whooping cough. Artificial Musk consisted formerly of a resinous substance formed by action of Nitric Acid on Oil of Amber.

Muira-Puama.—This drug, which comes from Brazil, has been described as belonging to *Liriosma Ovata*, Miers (fam. *Olacaceæ*). The drug is said to contain an alkaloidal crystalline substance, an amorphous, bitter substance, a little fat, and two kinds of resinous acids. A careful examination which we conducted did not confirm the statement as to the presence of an alkaloid. The samples of roots which we examined were, however, obtained in the ordinary way of commerce, and as these Brazilian drugs are much confused (different plants go under the same name in different provinces) it is just possible that the actual drug does contain an alkaloid. At the time of going to press direct imports from Brazil were awaited. A number of plants have the name Muira. It has an irritating action, also tonic aphrodisiacal properties. Efficacious in the treatment of nervous disorders.—F.N. 1906. **Muiracithin** consists of the residue *in vacuo* of 100 Gm. fluidextract of Muira-Puama and 5 Gm. Lecithin, with Licorice Powder added made into 100 pills. *Dose*, three to four pills daily before meals, one morning, one noon and two in the evening. **Pilula Potentin Composita**, contains Muira Puama Extract 1 grain

with Ovolecithin 1 grain. A useful nerve stimulant and aphrodisiac. *Dose*, 3 to 6 per diem before meals.

Myricin.—*Dose*, 2 to 5 grains. The powdered extract of *Myrica Cerifera*. An astringent and stimulant, and in large doses, emetic. For diarrhœa and jaundice.

Myristica, Nutmeg (*Off.*), U.S. *Dose*, 5 to 15 grains (0·32 to 1·0 Gm.). Dried seed of *Myristica fragrans* (*Myristicaceæ*) with testa removed. Aromatic, carminative, and stimulant. Contains **Nutmeg Oil**. *Dose*, ½ to 3 minims. Colourless or pale yellow liquid with Sp. Gr. 0·870 to 0·910. Should yield no crystallising residue on evaporation on water bath. Has properties representative of the seeds. The expressed or concrete oil of nutmeg of yellowish colour contains **Myristicin**, which is chemically an allyl-pyrogallol compound, $C_{12}H_{14}O_3$ = 204·56 (206·112 I. Wts.), as U.S. It is occasionally employed as a gentle local stimulant. Spirit of Nutmeg (*Off.*). *Dose*, 5 to 20 minims. Poisoning by chewing nutmeg.—B.M.J. i./06,538.

Myrrha (*Off.*), U.S. *Dose*, 5 to 10 grains. Yellowish or reddish gum resin from *Balsamodendron Myrrha* (*Burseraceæ*) and other species. Soluble in water to the extent of about 50% (forms whitish emulsion on trituration with), the remainder being mostly soluble in alcohol 90%. It is soluble in alkalis, *e.g.*, Potassium Carbonate. A favourite constituent in mouth washes, *e.g.*, Tincture of Myrrh and Borax, 1 of each in Eau de Cologne 20. The Ash amounts to 6·3%; of this 15·4% is magnesium carbonate. A determination of the amount of magnesium carbonate in the ash of myrrh might tell whether the drug is genuine or adulterated.—P.J. ii./05,128. Constituents of Myrrh, report on.—P.J. i./06,128. Nitric acid should give with genuine myrrh a transparent dirty yellow liquid. False myrrh may give a bright yellow solution, and bdellium is not dissolved. **Tincture** (*Off.*), 1 in 5 alcohol 90%; U.S., 1 in 5 alcohol 94·9%.

Myrtillus (*Vaccinium Myrtillus*).—Bilberry or whortleberry. An extract or jam has been employed with good results in dysentery, and has been painted on the tongue in stomatitis. It is said to be of great value in typhoid, rendering the intestine aseptic. Suppositories containing 1 Gm. of the extract, and a liquid extract are prepared. An enema is also used. *Dose*, 2 to 3 tablespoonfuls.—B.M.J. i./03 306,402, 485,972; P.J. i./01,702; C.D. i./03 273. The fruits are in P.Austr.

Myrtol. — A constituent of myrtle oil; has been recommended in putrid affections of lungs and air passages. Expectoration lessened, but no effect on bacilli. *Dose*, 5 to 15 minims on sugar. **Capsules** contain 2 and 5 minims.—B.M.J. i./89,336; P.J. 1889,782; Y.B. 1890,307.

Naftalan.—A German specialty. An ointment prepared by dissolving 2½ to 4% of anhydrous soap in purified petroleum naphtha. Used as an application for arthritis, rheumatism and eczema. Melts at 70°C.—C.D. 1898,250; Therap. 1899,68.181. Useful in bedsores.—P.J. ii./00,206. Nafalan, a new Naftalan.—B.M.J.E.i./05,39.

Œnanthe crocata. Water dropwort. (*Umbelliferæ.*) Contains Œnanthotoxin, which gives rise to convulsions by action on the spinal medulla. Poisons children, being mistaken for angelica.

Orthosiphonis, Ph. Ned. *O. Stamineus* (*Labiatæ*). Java tea.—N.8.D.850.

Pareira, (*Off.*). U.S. *Average dose* (U.S.), 30 grains. Dried root of *Chondrodendron tomentosum*, c.f. *Cissampelos*, p. xxv. *Uses.*—Similar to those of Buchu. Employed in chronic inflammation of the genito-urinary tract. **Fluid-extractum Pareiræ,** U.S., 1=1 Glycero-alcoholic. *Average dose*, 30 minims. **Extractum Pareiræ Liquidum** (*Off.*). *Dose*, ½ to 2 drachms. Extract the Pareira Root in No. 40 powder with boiling water. Evaporate the liquor until it contains 33⅓% extractive matter. Add to 3 volumes of such, Alcohol 90% to produce 4. *Greenish's improved formula* :—Mix 20 of Alcohol with 20 of Glycerin, and 60 of Water. Moisten Pareira Root 100 in No. 10 powder with 40 of this mixture. Pack in percolator and percolate with remainder, continuing the percolation with 20% Alcohol until exhausted. Reserve the first 75, concentrate subsequent percolates to soft extract, and dissolve in the reserve, adding Alcohol 20% *q.s.* to make 100. Allow to stand 14 days and filter.—P.J.ii./04,701.

Pelargonium flabellifolium. Root from Natal possesses great astringency. *Dose.*—5 to 20 grains, found useful in dysentery. Tablets Compound, Pelargonii 5 gr., Opii ¼ gr., Ipecac. ¼ gr., Bismuth. Salicylat. 2½ gr., *dose*, 1 or 2.—P.J. i./01,540.

Pepo, U.S.—Ripe seed of *Cucurbita Pepo* (*Cucurbitaceæ*), Pumpkin. *Average dose*, 1 ounce (30 Gm.). Said to be a never-failing remedy for tapeworm, given before breakfast followed by coffee and later a brisk cathartic.

Periplocin.—A glucoside from *Periploca græca.* Amorphous yellowish powder, soluble in water and alcohol. *Dose*, $\frac{1}{100}$ grain in 1 in 1,000 solution and has vasodilatory action.—F.N., 1906,211.

Phaseolus Lunatus, from Mauritius. Contains a cyanogenetic glucoside, Phaseolunatin, and an enzyme probably identical with the Emulsin of Almonds. Acetone, Dextrose and Prussic Acid (as much as 0·09%) are formed on hydrolysis. The Burmah Seeds, however, particularly the white, yield considerably less, but none can be suitable for food of animals, at any rate in the raw condition.—B. & C.D. ii./05,288.

Phaseolus Radiatus.—The fruits called by the Malays Katjany-idgo have been used in beri-beri with encouraging results. Known as a remedy since 1747, when it was used by Rumulus, a Dutch medical man. 150 Gm. daily given; result to be looked for in 14 days.—'La Caducée,' March, 1905,79.

Phloridzin, $C_{21}H_{24}O_{10}2H_2O = 468{\cdot}67$ (472·224 I. Wts.). *Syn.* Phlorizin. A glucoside from various rosaceous trees, in pinkish-white crystals, sparingly soluble in water, in alcohol 90% 1 in 4, and in ether, and induces artificial diabetes (glycosuria) in doses of at least 15 grains (*v.p.* 259). A valuable mild tonic, suitable for children; a substitute for quinine. *Dose*, Tonic 5 grains, Antiperiodic, 15 grains.

Phytolaccin. *Syn.* Poke Root. *Dose*, 1 to 5 grains. Extractive from *Phytolacca Decandra* (*Phytolaccaceæ*), U.S. Has emetic, cathartic and alterative properties. Has been used in rheumatism and syphilitic affections. A tincture 1 in 10

alcohol 45%. *Dose*, 3 to 10 minims. **Fluidextract**, U.S. 1=1 by Diluted Alcohol. *Average dose*, Emetic 15 minims alterative 1½ minims. Locally applied for painful mammæ.

Pichi.—Leaves and twigs of *Fabiana imbricata*; useful in gravel and some kidney diseases. Liquid Extract. *Dose*, 10 to 60 minims. Has given good results in gonorrhœa and cystitis.

Pimento (Allspice) (*Off.*), U.S. Dried full-grown unripe fruit of *Pimenta officinalis* (*Myrtaceæ*). From W. Indies. *Aqua Pimentæ* (*Off.*) 1 in 20. *Dose*, 1 to 2 ounces. **Pimento Oil.** *Dose*, ½ to 3 minims. Yellowish colour. Miscible in all proportions with Alcohol 90%. Stomachic, carminative, antispasmodic. Put into hollow teeth to relieve pain.

Pinus Canadensis.—The hemlock spruce of the U.S.A. *Syn.* Abies Canadensis. A fluid extract is used as an astringent in leucorrhœa; and given internally for diarrhœa, hæmoptysis, and night sweats. *Dose*, 10 to 60 minims, also a distilled colourless variety in commerce.

Pollantin. A Hay Fever specific. Professor Dunbar and Sir Felix Semon have called attention to an anti-serum obtained by treating a horse with irritant toxins obtained from the pollen of grasses.—B.M.J. i./03,713.743,1235,1279, 1291. It is not a panacea.—B.M.J. ii./03,123,220. A few drops instilled into the eye or nostrils, when an attack of hay fever comes on, checks the suffusion of the conjunctivæ and the sneezing and general discomfort.—L. ii./03,1462.

The serum is preserved by ¼% carbolic acid, and is sterile. Reports of cases.—B.M.J.E. ii. /04,11. Also supplied in dry form as snuff. Gratifying results in ten cases. The flower "Golden Rod" is used.—B.M.J.E. i./04,79. Semon on the serum.—B.M.J. i. /04,80; P.J.F. No. 2468, P.J. ii./05,24.

Populin. — Benzoyl - Salicin, $C_{13}H_{17}(C_7H_5O)O_7 + 2H_2O$ = 423·00 (426·208 I. Wts.). From *Populus tremuloides* (*Salicaceæ*). *Dose*, 1 to 4 grains. Has antipyretic properties. A simple way of producing synthetic Populin.—P.J.ii./04,233.

Psidium Guajava, Ph. Ned. (*Myrtaceæ*). The leaves are mildly aromatic and astringent.—N.S.D. 995.

Pterocarpi Lignum. Red Sander's Wood. U.S. Heart wood of *Pterocarpus santalinus* (*Leguminosæ*). Contains santalin, and is used as a colouring agent in compound tincture of lavender.

Pulegium. Pennyroyal (*Labiatæ*). Oleum Pulegii, Oil of Pennyroyal; European. Encourages menstruation—administered in form of a hot tea at bedtime. Is reputed to produce abortion. This is distinct from the Oil passing under that name in U.S., *i.e.*, Oleum Hedeomæ, from *Hedeoma Pulegioides* (*Labiatæ*), which has similar properties.

Pyrethri Flores. The dry flowers of *Pyrethrum roseum* and *P. carneum* in powder as a dusting powder to keep off insects. Those from Dalmatia are from *Pyrethrum cinerariæfolium* (*Compositæ*). A Tincture, 1 in 4 Alcohol 60% is used as an insecticide lotion.

Pyrethri Radix. — Pellitory Root (*Off.*), U.S. *Average dose*, 30 grains. Dried root of *Anacyclus Pyrethrum* (*Compositæ*). A useful sialogogue, causing considerable salivary effusion; is used in the form of tincture 1 in 5 (U.S. Alcohol

94·9% vol.). Must be given with caution to children, as it is powerful in effect. **Glycogelatin Pastils** are made containing 1 grain of the powder for dryness of the mouth.

Quassia (*Off.*).—Jamaica Quassia. Wood of *Picræna* (or *Picrasma*) *excelsa* (*Simarubaceæ*). Contains picrasmin. Infusion 1 in 100. Chiefly employed as a bitter tonic. Liquor Quassiæ Concentratus 1 in 10 (*p.* 459), Tincture 1 in 10. By rectal injection the daily use of a strong infusion will get rid of tapeworms and threadworms. *Surinam Quassia* (not now in use) is the wood of *Q. amara* (U.S.), a branching shrub, whereas *P. excelsa* is about 100 feet high. **Extractum Quassiæ**, U.S., aqueous extract made up with milk sugar. (Powder form, 1=10 of drug). **Fluidextractum Quassiæ**, U.S., 1=1 Hydro-alcoholic. *Average dose*, 8 minims. Quassia is free from tannin, hence compatible with iron preparations as tonic. It contains **Quassin**, $C_{10}H_{12}O_3(?)=178{\cdot}74$ (180·096 I.Wts.), which forms lamellar crystals, soluble about 1 in 400 of water, soluble also in acid and caustic alkaline solutions. Increases secretion of salivary glands and kidneys, and stimulates digestion. *Dose*, $\frac{1}{30}$ to $\frac{1}{3}$ grain.

Quercus, U.S.—Bark of *Quercus Alba*, Linné (*Cupuliferæ*), White Oak. **Fluidextract** (1=1 Glycero hydro-alcoholic astringent).—*Average dose*, 15 minims. Lotion, 1 in 20 of water, for leucorrhœa and gonorrhœa of women. Also for hæmorrhoids, and gargle for sore throat.

Quillaia saponaria (*Rosaceæ*). (*Off.*). P. Austr. *Syn.* Panama Bark (Soap bark). Contains quillaic acid, $C_{19}H_{30}O_{10}=415{\cdot}09$ (418·24 I. Wts.), and sapotoxin, $C_{17}H_{26}O_{10}+H_2O=405{\cdot}15$ (408·224 I. Wts.), closely allied to saponin. Has a sweetish but acrid after-taste, and possesses emulsifying properties, causing frothing in water in which it has been macerated. Its lather kills pediculi of scalp. Soap-bark has been used as an expectorant in bronchitis, contra-indicated in inflammation of the intestines or stomach, or ulcerated condition of the mucous membrane. Is used for emulsifying tar preparations, and in Emulsio Chloroformi. **Tincture** (*Off.*), 1 in 20 of Alcohol (60%). Five minims of this will emulsify 1 drachm of fixed oil. U.S. approximately the same. *Dose*, 30 to 60 minims. Fluidextract, U.S., 1=1. *Average dose*, 3 minims. The powder has very marked sternutatory properties. Acne Lotion—Decoction of Quillaia 4 ounces, Eau de Cologne 60 minims, Ammonia Solution 10 minims. Use night and morning.—C.D. ii./05,1052. It has poisonous properties.

Rhinacanthus Communis, Treba Djapan, **Ph. Ned.** The root used in India in ringworm and other skin diseases. **Acetum, Ph. Ned.** Strength 1 in a mixture of Alcohol (90%) 1 and Acetic Acid (6%) 9.

Rosæ Gallicæ Petala (*Off.*), U.S. The fresh and dried unexpanded petals. **Confectio Rosæ Gallicæ** (*Off.*).—Fresh Red Rose Petalis 1, Sugar 3, beaten together in a stone mortar. **Infusum Rosæ Acidum** (*Off.*).—Petals ½ ounce, Dilute Sulphuric Acid 2 drachms, Boiling Water to 1 pint. Infuse 15 minutes. **Syrupus Rosæ** (*Off.*).—Petals 2, Sugar 30, Water *q.s.* to 46. U.S. has Fluidextract 125, Diluted Sulphuric Acid 10, Sugar 750, Water to 1,000. **Fluidextractum Rosæ**, U.S., 1=1 Glycero-hydro-alcoholic.

Rubus Chamæmorus (*Rosaceæ*).—Cloudberry, Norwegian blackberry, marsh or dwarf raspberry. The leaves of this ar diuretic, useful in nephritis, cirrhosis of liver, and cardiac affec tions. Infusion, 1 in 12, *dose*, ½ ounce; fluid extract, *dose* ½ to 1 drachm. Fruit is antiscorbutic and used for hæmoptysis

Rubus Villosus or *Rubus nigrobaccus* or *Rubus cuneifoliu* (*Rosaceæ*) (species of Blackberry) is Official in U.S. **Fluid extract**, U.S., 1=1 Diluted Alcohol. *Average dose*, 15 minims **Syrup**, U.S.—Fluidextract 1, Syrup to 4. *Average dose* 1 drachm.

Sabina, U.S. *Average dose*, 7½ grains. Tops of *Juniperu Sabina* (*Savin*), Linné (*Coniferæ*). **Fluicextract**, U.S. 1= Diluted Alcohol. *Average dose*, 5 minims. **Oleum Sabina** (*Off.*), U.S. *Dose*, 1 minim. Has emmenagogue and abort facient properties.

Sagapenum.—*Dose*, 10 to 30 grains. A gum-resin, rarel met with; is in yellowish-red pieces. Has a taste somewha resembling asafœtida, and prop rties similar to this and gal banum, for use in amenorrhœa and hysteria.

Salep.—Tubera Salep, P.G., Ph. Ned. Dried tubers c various species of Orchis and allied plants. When fresh hav bitter taste. They are immersed in boiling water after collec tion; contain mucilage and have nutritious and demulcen properties; allay gastro-intestinal irritation. Mucilago Salep P.G. Freshly made.

Salix nigra.—The bark of this, the black or pussy willow is used as a sexual sedative, tonic and astringent, and given fo gonorrhœa and spermatorrhœa. Liquid extract, 1 in 1. *Dose* ¼ to 1 drachm. Relieves ovarian pain and nocturnal emissions —B.M.J. ii./87,237; L. i./88,869. **Salix discolor** (Muhl yields Salinigrin,—a new glucoside,—the glucoside of *m*-oxy benzaldehyde.—Y.B.P. 1902, 483.

Salvia, U.S. — Sage (*Labiatæ*). *Dose*, 15 to 30 grains Dried leaves, aromatic, astringent tonic.

Sambuci Flores (*Sambucus nigra—Caprifoliaceæ*), Elder berry flowers (*Off.*). Infusion and pomade are used a domestic remedies for sores, bruises, etc. **Aqua Sambuci** (*Off.*) is prepared from the fresh flowers (or flowers preserve with common salt), a frequent ingredient in lotions for th eyes and skin. **Rob Sambuci, Ph. Ned.** Sambuci fructu recent 10, Water 1, shake 5 minutes, press out and dissolve i the juice 4 parts, sugar 1.

Saponins are toxic glucosides contained in Sarsaparil and Quillaia. Kobert of Rostock has recently published co siderable work on.

Sassafras Radix (*Off.*). *S. officinale*, or *S. variifoliu* (*Lauraceæ*), U.S. The oil (*Oleum Sassafras*, U.S.), containin Safrole, benzene derivative, is a useful pediculicide; it di lodges their nits; it should be applied with a stiff brush bu not touch the skin; yet, if so, a little bland oil allays th irritation it causes. Black Sassafras, *v.p.* xxvii. **Safro** U.S. $[C_6H_3C_3H_5(OOCH_2)\ 1\ :\ 3\ :\ 4]=160{\cdot}86$ (*Off.* and U. Wts.) (162·08 I. Wts.). Obtained from camphor oil, sassafr oil, and other volatile oils, is used for scenting soaps and an anodyne liniment in subacute rheumatism. Optical

inactive, soluble in an equal volume of strong alcohol and in 30 of 70% alcohol. *Dose*, 20 to 30 minims. **Mucilage of Sassafras Pith**, U.S. 1 in 50 by cold maceration. Used internally in diarrhœa and as a collyrium.

Saw Palmetto.—A palm growing in America. Possesses sedative, tonic and diuretic properties. Is largely used in urethritis, gonorrhœa, dysmenorrhœa, impotence, cystitis. A liquid extract 1=1. *Dose*, ½ to 2 drachms. A solid extract is also prepared. *Dose*, 3 to 5 grs. in pill or tablet. Is also frequently combined with Santal in a miscible form, *e.g.*, Sanmetto. **Sabal**, U.S., is the partially dried ripe fruit.

Scilla (*Off.*). *Dose*, 1 to 3 grains. The bulb of *Urginea Scilla* (*Liliaceæ*) (*U. maritima*, U.S.), with membraneous outer scales removed, cut into slices and dried. Resembles Digitalis. It is also expectorant and even more diuretic. *Official* are **Acetum Scillæ**, 1 in 8 of Dilute Acetic Acid (**P. Austr.** 1 in 10: **Ph. Ned.** 1 in a mixture of Alcohol 90% 1, Dil. Acetic Acid, 6% 9); **Oxymel Scillæ**, Squills 2½ ounces, Acetic Acid 2½ ounces, Water 8 ounces, Clarified Honey *q.s.* to Sp. Gr. 1·320; **Pilula Scillæ Composita**, Squills 1¼, Ginger 1, Ammoniacum 1, Hard Soap 1, Syrup of Glucose 1; and **Tincture**, 1 in 5 of 60% alcohol. In U.S. are **Acetum** 1 in 10; **Fluidextract**, 1=1 Acetic, *average dose* 15 minims. **Syrup**=Vinegar of Squills 45, Sugar 80, Water to 100; **Syrupus Scillæ Compositus**, *average dose* 30 minims=Fluidextract of Squill and of Senega each 80, Antimony Potassium Tartrate 2, Sugar 750, Water to 1,000. **Tincture**, U.S., 1 in 10.

Scopola Carniolica (*Scopolina atropoides*).—The root of this, an Austrian plant, has been imported as a substitute for belladonna, and is contained in U.S., 1900, with not less than 0·5% alkaloids, assayed as belladonna leaves. Scopola root contains two bases—(a) scopolamine, optically active, which is identical with hyoscine, and (b) scopolamine, which is optically inactive, and which is identical with Hesse's atroscine. —Naylor Presidential Address, B.P.C., P.J. ii. /05,123. Given internally, it is said to cause less dryness of the throat than belladonna, and is probably more nearly allied to hyoscyamus in its action. Liniment, Ointment, and Plaster, corresponding to those of Belladonna are prepared, also Extract. U.S. 2% alkaloids. Yield is (in pill consistence) 16–20% of the drug. Made by concentrating Fluidextract. *Average dose*, ⅓ grain. **Fluidextract**, U.S. *Average dose*, 1 minim, 1 = 1 Hydro-alcoholic, and **Tincture**, *dose*, 5 to 30 minims. For **Scopolamine**, mydriatic alkaloid, *vide* also *p.* 415.

Scutellaria, U.S. 'Skullcap.' *Average dose*, 15 grains. Dried herb of *Scutellaria lateriflora*, Linné (N.O. *Labiatæ*). Used in the form of dry, greenish-brown powdered extract (scutellarin). *Dose*, 1 to 5 grains. For epilepsy, insomnia, and hiccough, **Fluidextract**, U.S., 1 = 1, hydro-alcoholic. *Average dose*, 15 minims.

Senecio.—Ragwort. *Senecio Jacobœa* and *S. aureus* (*Compositæ*) are emmenagogues, and have been employed in amenorrhœa and dysmenorrhœa, especially when depending on chill. Liquid Extract, 1 = 1 of herb. *Dose*, 20 to 60 minims. Tincture, 1 in 10 of proof spirit. *Dose*, 1 to 2

drachms. Two alkaloids, Senecionine, $C_{16}H_{25}NO_6$(?) = 324·78 (327·24 I. Wts.) and Senecine are contained. Excellent in gastralgia and dyspepsia.—P.J. ii./04,967.

Senega (*Off.*), U.S. Dried root of *Polygala senega* (*Polygalaceæ*). An expectorant, contains Senegin. **Infusion** 1 in 20, Concentrated Solution 1 in 2, and Tincture 1 in 5. **Fluidextract**, U.S., 1 = 1. *Average dose*, 15 minims. The alkali contained forms soluble compounds with the pectin principles in the root thus preventing gelatinisation (Caspari). **Syrup**, U.S.—Fluidextract 1, Simple Syrup to 5. The concentrated infusion of commerce is apt to deposit, owing to action of enzymes; less likely to if made with a little alkali. **Polygalæ Radix, P. Belg.**, is the same. Fluidextract P. Belg. yields 25 % solid matter. Tincture 1 in 5.

Present knowledge of constituents.—Naylor, P.J., July 28,06.

Serpentariæ Rhizoma (*Off.*), U.S. *Average dose* 15 grains (1·0 Gm.). Dried rhizome and roots of *Aristolochia Serpentaria* (*Virginia Serpentary*) or of *A. reticulata* (*Texas Serpentary*) (*Aristolochiaceæ*). Bitter tonic. Official are Infusion 1 in 20, Concentrated Solution 1 in 2, Tincture 1 in 5. **Fluidextract**, U.S., 1=1 Hydro-alcoholic. *Average dose* 15 minims (1 Cc.). **Tincture**, U.S., 1 in 5 of Alcohol and Water in proportion of 65 and 35.

Shellac.—A resinous substance formed by a scale insect *Tachardia Lacca* (fam. *Coccidæ*, ord. *Hemiptera*), which lives on a large number of trees, *e.g.*, *Butea frondosa*, *Ficus religiosa*, *Schleichera trijuga*, *Shorea robusta* (Wild Lac). The plants specially cultivated for Lac are *Acacia arabica* and *Cajanus indicus*. The red dye or lake washed out in the process of manufacture is now no longer a commercial article. A small proportion of common resin and powdered orpiment, and necessary colours for decorative work added.—P.J. ii./05,646. Umney's treatise on chemistry of shellac.—P.J. ii./05,653.

Simaba Cedron.—Tincture of the seeds hypodermically for malaria with good results.—Med. Times xxix. No. 10.

Simaruba officinalis (*Simarubaceæ*).—*Syn.* Mountain Damson. *Dose*, 15 to 30 grains. Infusion 15 grains to ounce in boiling water (infuse 15 minutes). *Dose*, 1 ounce. Has bitter taste, is astringent, and useful in dysentery.

Simulo.—Fruit of *Capparis coriacea*, from Peru. If powder, 45 grammes in 500 grammes of sweet wine, of which a wineglassful was taken every night and morning, cured case (Dr. Larrea, who narrates it) of epilepsy after he had 11 fits, preceded by a distinct aura. He has used it much in nervous diseases, hysteria, and epilepsy. — L. i./85,722; B.M.J. i./85,1184; P.J. 1885,890. Cases of epilepsy improved by its use.—L. i./88,617. For chorea.—Th. Gaz. 1890,692.

Solanum Carolinense.—Horse-nettle. A native of Southern U.S. A liquid extract 1=1 is employed in epilepsy. *Dose*, 15 to 60 minims.—H.

Solanum Dulcamara (*Caules Dulcamaræ*, P. Austr.) (*Solanaceæ*).—Woody nightshade, Bittersweet. The dried herb is employed. Sedative, analgesic. Contains the alkaloid 'Solanine.' That from **Solanum sodomœum**, ($C_{23}H_{39}NO_8$)H_2O = 925·7 (932·72 I. Wts.).—C.D. ii./05,374. **Extractum**

Dulcamaræ, P. Austr.—An aqueous extract inspissated and mixed with equal amount of acacia, and powdered.

Sorbus Aucuparia.—The Mountain Ash. A liquid extract is prepared 1=1. *Dose*, 10 to 30 minims. A useful mild aperient; also has diuretic and emetic properties.

Sorghum, Chinese Sugar Cane, *Andropogon arundinaceus* (*Gramineæ*). Indigenous in China and India and cultivated in U.S. Proprietary preparations such as 'Litbiated Sorghum Comp., are popular in America in bladder affections.

Spigelia, U.S. *Sp. Marilandica* (*Loganiaceæ*), Indian Pink-root. *Average dose*, 60 grains. **Fluidextract**, U.S., 1=1 diluted Alcohol. *Average dose*, 1 drachm. Is employed for round and tapeworm, but is very potent. Ruellia has been confused with it, and Phlox Carolina is erroneously regarded as an adulterant.

Styrax Præparatus (*Off.*), U.S. Thick brownish liquid compound obtained from *Liquidambar orientalis* (*Hamamelidaceæ*). Contains Cinnamyl Cinnamate (Styracin) and other Cinnamic Acid Compounds, together with a large proportion of Storesin, $C_{36}H_{55}(OH)_3$=534·4 (538·464 I. Wts.).

Ointments of 20% are used in parasitic skin affections.

Succinum—Amber obtained from a fossil resin found in Germany. Oleum Succini. *Dose*, 1 to 5 minims. Useful in persistent hiccough, asthma, whooping cough and hysteria. Diluted with Olive Oil is rubbed upon rheumatic parts and upon the chest for bronchitis and pertussis.

Sumbul Radix (*Off.*), U.S. Dried transverse slices of the root of *Ferula Sumbul* (*Umbelliferæ*). Sumbul (U.S.) is from an undetermined plant, probably belonging to the natural order *Umbelliferæ*. Nervine, sedative, and anti-hysteric. Has aromatic odour, due to volatile oil, also contains resin. **Tincture**. (*Off.*) 1 in 10. *Dose*, 30 to 60 minims. Extract Sumbul average yield is 15% (Caspari). **Fluidextract**, U.S., 1=1, hydro-alcoholic. *Average dose*, 30 minims.

Sutherlandia frutescens (*Leguminosæ*).—Cancer Bush, Kanker Bosche, a S.A. Dutch remedy. An infusion of the bark and leaves for cancer.—B.M.J. i./06,759.

Symphytum officinale.—The Comfrey plant and root boiled as a poultice for sarcomatous or cancerous tumours; one such cured.—L. i./99,810. For hæmoptysis and kidney disease with blood in the urine, as a decoction or syrup.—L. i./99,939. General uses, from an old herbal.—L. i/99,1068. Root pulped was used to stiffen bandages for fractures.

Symploci Folia, Ph. Ned. (*S. odoratissimus*). This and *S. Racemosus* are given in menorrhagia.

Tanacetum, Tansy.—Leaves and tops of *Tanacetum vulgare*. An aromatic bitter used as a vermifuge, but may cause dangerous irritation. **Liquid Extract**, 1=1. *Dose*, 15 to 30 minims.

Taraxacum officinale (*Compositæ*) (*Off.*), U.S. *Average dose*, 120 grains. Official in this country are: **Extractum** from fresh root, *Dose*, 5 to 15 grains; **Liquid extract** 1=1, *Dose*, ½ to 2 dr.; **Succus**, 3 of expressed juice with 1 of Alcohol 90%, *Dose*, 1 to 2 dr.; **Taraxacum Cocoa**. An agreeable hepatic

stimulant suitable for children and infants who are bilious. *Dose*, one tablespoonful to be taken in the morning. **Fluidextractum**, U.S., 1=1 Hydro-alcoholic with 5% of Soda. *Dose*, 2 drachms. Sodium Hydroxide is added to neutralise natural acidity and make compatible with alkalis.

Taxus Baccata.—The Yew. Taxine, $C_{37}H_{51}NO_{10}$ = 664·41 (669·448 I. Wts.), an alkaloid, is extracted. White crystals soluble in alcohol and ether. *Dose*, $\frac{1}{100}$ to $\frac{1}{60}$ grain. Is said to have an action on circulation.—Proc. Chem. Soc. Vol. 18, No. 253.

Terebinthina Canadensis (*Off.*), U.S.—The balsam obtained from *Abies balsamea* (*Coniferæ*), known as Canada Balsam, is used for microscopic purposes as a mounting medium. Is a constituent of Collodium Flexile (*Off.*) It has a refractive index approximating that of microscopic glass, and 'sets' in a non-crystalline transparent condition. In preparing for use it has to be gently heated in an open dish for a week or more until a small quantity removed becomes brittle when placed on a cold slab. Canada Balsam 1 part by weight in Xylol, in turpentine, in benzol, and in chloroform, each 1 by measure, are prepared for microscopic use. The first mentioned is chiefly employed and is frequently designated '**Xylol-Balsam.**'

Teucrium Scordium (*Labiatæ*).—Water Germander. *Dose*, 10 to 20 grains. Contains a volatile oil and a bitter principle. Given for hæmorrhoids and pruritus ani. Diaphoretic; tonic for scrofula, gout, dropsy, flatulence. Liquid Extract. *Dose*, ½ to 1 drachm.

Thapsia.—The root of *Thapsia garganica*, an umbelliferous plant grown in Algeria (allied to the Silphion of the ancients); when exhausted with alcohol yields a resin which is employed in the French Codex to form a rubefacient plaster, Emplastrum Thapsiæ; Fr. Sparadrap de Thapsia, Emplâtre Révulsif de Thapsia.

Thuja Occidentalis.—Arbor Vitæ. A Tincture is prepared, of the dried young tops in 10 of 70% alcohol. *Dose*, 2 to 5 minims (0·12 to 0·3 Cc.). Thuja has an irritating action on the skin, and has been employed to remove warts and fungoid granulations from ulcers; internally for amenorrhœa, pulmonary catarrh, and worms. **Ecthol.** *Dose*, 1 drachm well diluted. Is said to contain *Thuja occidentalis* and *Echinacea angustifolia*. Employed in all forms of septic conditions, *e.g.*, blood poisoning, typhoid, erysipelas, diphtheria, acne, etc.; also locally for any kind of pustular formation; as wound dressing, diluted with 2 to 10 times volume of boiled water.

Tonga.—A specialty for neuralgia. Dose, 1 to 2 drachms. A liquid prepared from *Epipremnum mirabile* and *Premna Taitensis*. **Succus Ari**, prepared from *Arum maculatum*. *Dose.*—1 drachm. Relieved a case of neuralgia in which Tonga was equally successful.

Tulipa.—An extract of the bulb under the name of **Chielin**, in the form of a cream and soap, is advocated in eczema. The soap is suggested also for seborrhœa, acne vulgaris, and similar affections. It is soaked in water, is applied to the skin, and allowed to remain on during the night.—B.M.J.E., ii./02, 80; M.A,1904.15.

Ulmus fulva (*Ulmaceæ*).—The Slippery Elm grows in America (*Ulmus campestris* is common in Europe). The inner

bark of fibrous texture has a highly mucilaginous taste; in powder is much used as a demulcent. It should be free from starch. Ten grains shaken with an ounce of water should form a thick jelly-like fawn coloured mass. *Decoction*, 1 in 8. A mucilage 1 in $16\frac{2}{3}$ is Official in U.S.

Vanadium. V = (51·2 I. Wts.). — Meta-Vanadic Acid, HVO_3 = 100·208 (I. Wts.), and Sodium Meta-Vanadate, $NaVO_3$ = 122·25 (I. Wts.). Of these the last has been used in chlorosis, phthisis, and rheumatism as tonics and stomachic antiseptics.—P.J. i./98,603. *Dose*, $\frac{1}{3\frac{1}{2}}$ grain (0·002 Gm.) or $\frac{1}{5}$ the quantity injected hypodermically. Soluble in water, 2 in 1; decomposes in the presence of organic matter. Preparation of, and other directions *re* pharmacology of Vanadates. — P.J. ii./99,1493; i./00,46; B.M.J.E. ii./99,91; improves appetite and nutrition. — B.M.J.E. ii./01,88. **Vanadine.**—Under this name a liquid preparation of French manufacture, said to contain a vanadium salt and sodium chloride. Is used for gastralgia and dyspepsia.

Vanillin.—Methylprotocatechuic Aldehyde, $C_6H_3OH.OCH_3.COH.4:3:1$ = 150·92 (150·064 I. Wts.). Occurs in white acicular crystals, having a strong odour if obtained from *Vanilla planifolia* (*Orchidaceæ*), U.S. (the cured full-grown but immature fruit), but is also obtained as a derivative of coniferine, a glucoside obtained from coniferous woods, or is made from several ortho-dihydroxybenzene derivatives (U.S.). Soluble in alcohol, ether, and oils, sparingly so in water. Use suggested in atonic dyspepsia as an excito-motor stimulant. For employment as test, *v.p.* 862. **Solutio Vanillin.**—Vanillin 80 grains, Alcohol 90% to 1 ounce. For ordinary purposes $\frac{1}{2}$ drachm will flavour a pint of medicine. For note on manufacture of Vanillin *vide* Caspari. **Eupvrine.** *Syn.* Para-Phenetidin-Vanillin-Ethyl-Carbonate, $C_{19}H_{21}NO_5$ or $C_6H_4(OC_2H_5).N = CH.C_6H_3(OCH_3).O.COOC_2H_5$ = 340·63 (343·2 8 I. Wts.). *Dose*, 15 to 30 grains. Soluble in Alcohol 90%, insoluble in water. Has antipyretic properties.

Verbena Officinalis. — Vervain. Is a remedy for epilepsy.—B.M.J. ii./04,1599.

Vinca major.—Great Periwinkle Herb. Is astringent, and has been used for menorrhagia. Infusion, 1 in 10. *Dose*, a wineglassful frequently. Liquid extract, 1 to 2 drachms.

Viola Odorata.—Has been used in cancer both internally and externally. A **liquid extract** is prepared (2=1 of fresh leaves). *Dose.*—Internally, 1 teaspoonful. May also be rubbed in locally. A fomentation of the leaves is also said to have given relief. The various species of Viola have similar properties. A poisonous alkaloid, Violin, is said to have been found in them, allied to Emetin, exists in the plant as malate. Schmidt gives Violaquercitrin (Mandelin) $C_{42}H_{42}O_{24}$ = 923·34 (930·336 I. Wts.), a glucoside as constituent. The herbaceous parts of the plant are mucilaginous, emollient, and slightly laxative. Salicylic Acid has, in addition, been found in various species. The root acts (in *dose* of 30 to 60 grains) as an emetic and cathartic. A decoction of the green leaves has been used.—C.D. ii./01,839,843. The British Homœopathic Pharm. employs a Tincture. In carcinoma, Violet treatment, no marked improvement. — B.M.J. i./06,187. Externally useful in cancer in the mouth.—L. i./05,713,1085;

P.J. ii./05,132. According to the latest researches 'Princess of Wales' violet leaves are preferred. They contain no alkaloid. The presence of glucosides amounting to 5% of the fresh leaves is confirmed. The leaves may be carefully dried at 50°C and powdered. The powder (20% of the fresh leaves) is suitable for administration in cachet and for making infusions and poultices. The estimation of the glucoside present in an infusion may be conducted on the basis that $C_{42}H_{42}O_{24} + 5H_2O = C_{24}H_{16}O_{11} + 3(C_6H_{12}O_6)$ (Violaquercitrin = Quercetin + Glucose) by boiling with dilute Acid to hydrolise and estimating the Glucose with Fehling's Solution.

Liquor Violæ Glucosidi. *Dose*, ½ ounce thrice daily. Is manufactured by macerating the fresh leaves two days in alcohol 90%, then percolate with alcohol to extract completely. Distil off most of the alcohol, and make up to volume with water (containing alcohol 30%) so that 1=1. Violet preparations in over 50 cases have relieved the pain, fetor, and size of malignant growths.—B.M.J. i./06,382.

Viola tricolor, U.S.—Flowering plant of Wild Pansy. Is supposed to contain a little Violin (see above), resembling Emetin in action. Is used externally as an ointment, and a poultice. *Dose*, 10 to 60 grains in infusion. An infusion in milk 1 in 10, very useful in acne vulgaris. The plant contains Salicylic Acid.

Viscum album.—Mistletoe (*Loranthaceæ*). The berries are said to be emetic and purgative. The plant contains Viscin, a kind of birdlime—Japanese Birdlime, which has been used as a plaster and is largely employed for making sticky fly-papers. Has been given for epilepsy and hysteria.—L. i./04,111. *Dose*, in powder, 10 to 60 grains. Is said to be an ingredient in Elepizone. Recommended for chorea.—W.W.W.

Xanthoxylum, U.S.—Dried bark of *Xanthoxylum Americanum* (Miller), Northern Prickly Ash; or of *Fagara Clava-Herculis* (Linné), small (Southern) Prickly Ash (N.O., *Rutaceæ*). Fluidextractum 1=1. *Average dose*, 30 minims. Hydro-alcoholic. Stimulant employed in rheumatism.

Yerba Santa (*Eriodictyon glutinosum* or *E. californicum*) —Leaves are aromatic and sweetish, often agglutinated together; they are stimulant in bronchitis, phthisis, and other catarrhal affections. Fluid extract, 10 to 40 minims. Is sold combined with extract of malt, as Malto-Yerbine. *Dose*, 1 to 4 drachms. Composition and preparations.—P.J. 1890,540; L. i./98,1114. *E. californicum* is Official in U.S. **Fluid extract** 1=1. *Average dose*, 15 minims.

Yohimbine Hydrochloride, $C_{22}H_{30}N_2O_4HCl$ (?) = 419·61 (422·778 I. Wts.).—The salt of an alkaloid obtained from Yohimbehe or Yumbehoa bark, is a reputed aphrodisiac. 1% solution, *dose*, 5 to 15 minims. Tablets contain $\frac{1}{15}$ grain. *Dose*, 1 thrice daily; may be increased to five. It has erotic powers.—B.M.J.E. i./01,103; i./05,28.

If the internal administration not successful, injections of 7 to 15 minims (½ to 1 Cc.) of a 2% solution may be tried.

A few drops of a solution ⅓ to 1% strength act as an anæsthetic when applied to the cornea. There is no mydriasis, and the anæsthesia lasts for an hour.—L. i./05,1012. 25 Cc. of a 1% solution may be injected subcutaneously for causing local anæsthesia, which lasts for an hour or two. It cures impotence.—B.M.J.E. i./05,28.

PHYSIOLOGICAL STANDARDISATION.

This method of testing is employed in those instances in which the drug contains no definite crystalline, easily isolated, active principle, *e.g.*, an alkaloid capable of extraction.

It consists in "determination of the change in function induced in living organisms, by the administration in the state of minute division of such inorganised substances as do not act merely as foods, for the purpose of identifying and adjust-the strength of drugs; this may be either qualitative or quantitative."

The physiological action of a drug is the affinity it possesses for certain constituents of the protoplasm of the cells of particular organs of the body. Thus Ergot has a specific action on the uterus. Cocaine has affinity for nerve endings, and Strychnine acts similarly on the protoplasm of the spinal cord. Furthermore, as a result of this elective principle, drugs, according to their specific action on the organs, are designated stimulant, depressent, or irritant. The animals used for physiological determination should obviously be of the same species and weight, and should have been grown and kept under similar conditions. It is often useful to divide the small animals (*e.g.*, frogs) into classes according to weight, and use these in 'batches' for experimental investigations. Much comparative work has been done with various **heart tonics**, *e.g.*, Digitalis and Strophanthus (1) by direct application of a solution to the laid-bare frog's heart, and (2) injection intravenously or subcutaneously into dogs, rabbits, &c.

The quantitative test is based on the fact that the killing power of heart tonics for 'similar' frogs is constant per unit of body weight. Comparisons are made between effects produced by the sample preparation under examination and a standard preparation, *e.g.*, a tincture made from genuine Kombé Strophanthus. Examples are given in which the minimum fatal dose in a series of frogs was 0·00016 Cc. of 'Standard Tincture,' and 0·00022 Cc. in case of the tincture under examination. Hence, as these volumes have the same killing power, the tincture under examination is of a strength $\frac{0{\cdot}00016}{0{\cdot}00022} = 72\%$ of the standard preparation which, it should be added, is a 100% preparation.

In the matter of **Ergot Preparations**, when these are given in suitable doses to cocks they produce a blackening of the comb—the blackening being proportional to the quantity of the drug administered and the rapidity of absorption. Reliable comparative results are said to be procurable on these lines by using a standard preparation against the one to be tested (but Dixon questions the valency of the comparison of this action with that on the uterus of a pregnant woman).

Indian Hemp preparations produce an intoxication in dogs to be compared with a standard preparation.

Suprarenal Glands and Adrenalin.—Standardisation of these has been effected against a standard freshly made 1 in 1,000 Adrenalin Solution. Adrenalin produces a transitory rise in blood pressure, and the rise is proportional to the amount of actual Adrenalin injected. For outline of technique see N.S.D., 1906, 1732. *See also body of work for all the above preparations.*

ANTITOXINS,

VACCINES

AND

ANTITOXIC SERUMS.

The discovery of the medicinal powers of the serum of animals which have been rendered immune to certain diseases, opened up a new source of therapeutic agents for use in diseases set up by bacterial intoxication.

Behring showed that toxins produced by the diphtheria bacillus when injected into an animal effected an immunity, and that the serum of this animal induced immunity to the disease when injected into another, and that it could be employed for treating the disease in the human body.

The antitoxins contained in this animal blood serum probably combine chemically with the toxins circulating in the blood and tissues of the sick person, they by so doing neutralise the power of the toxins, and thus the human body is recuperated.

It is assumed by Ehrlich that the **Toxin** molecule possesses two groupings, known respectively as the Haptophore and the Toxophore—the former is capable of combining with the cells of the body and with the Antitoxin, and the other is responsible for toxic effect. The Toxophore will combine with a **Toxophile** grouping in the cell, if present. He imagines the Haptophore group of the Toxin first of all to become attached to the Haptophile group of the cell, and if the cells do not possess side chains or groupings exactly corresponding to the Haptophore groups the Toxophore groupings cannot combine, and there is no injury to the cell. Diagrams in Hewlett's "Serum Therapy" illustrate the idea.

Ehrlich considers in his "**Side Chain**" **theory** that the protoplasmic molecule is in the nature of a chemical

molecule, possessing a central radical, and a number of lateral groups or side chains, each of which according to its character is capable of combining with certain bodies, *e.g.*, food stuffs, toxins, and every blood or cell poison which exists. These side chains are also called Receptors.

There appear to be two forms of bacterial disease, for on injecting an animal with diphtheria or tetanus toxin certain of the groupings are combined, and more of the same Receptors are produced to replace those used up. On injecting more Toxin, still more groupings arise; indeed there is a tendency to overcompensate the defect, until finally so many of these appear that they are thrown off into the blood, and these constitute the Antitoxins. These are free to combine with Toxins, preventing the action of the same on the cell. The Toxins of diphtheria and tetanus are extra-cellular "soluble" toxins excreted by the bacteria, found in the fluids in which they are cultivated. But in the case of typhoid, plague, &c., the toxins are apparently inherent in the bacterial cell; in this case there are two substances involved—first, an immunising body existing in the serum *after* treatment with the bacterium; the other, the "complement" which is present in normal serum in small quantity, but which rapidly decomposes after withdrawing the blood from the animal.

This accounts for the fact that antityphoid serum can only neutralise a small lethal dose of the typhoid bacillus, and possesses little curative effect—the complement being absent, bacteriolysis, *i.e.*, destruction of the bacilli cannot proceed.

Analagous to the process of bacteriolysis is that of hæmolysis, *i.e.*, the power of the blood serum of one species of animal to dissolve the corpuscles of the blood of another into which the blood has been injected; this hæmolytic power is destroyed by heat. The serum also of some animals is actively hæmolytic when injected into other animals. Again 'isolysins' may develop in human blood in disease which will act on the blood of another. Furthermore, 'autolysins' may be developed which cause, *e.g.* in toxic forms of anæmia, the destruction of the patient's own blood corpuscles.—Bosanquet.

The absence of success with the antityphoid and anti-cholera sera in man may be due to the fact that the "complement" in man is not met by an appropriate immune body in these sera. It has been suggested to employ in these diseases an injection of fresh serum at

the time of administering the antitoxin so as to increase the amount of the complement.

In some experiments on dogs leucocytes w re thought to be the source of the complement.—B.M.J.E.i./03,653.

For the theories of immunity, *see* B.M.J. i./03,653.

Ehrlich's Side Chain theory, however, has been attacked by two Danish workers, who question the existence of the haptophore and toxophore groupings, they conclude that only a single form of poison exists, and that the multiplicity of poisons in which Ehrlich believes is due to the fact that the two bodies, the toxin and antitoxin, are chemical bodies of weak affinity.—M.A. 1904,41.

It has been pointed out that an excess of Antitoxin may result in the antitoxin not actually engaged in neutralising toxin, producing an anti-antitoxin which would prevent the action of antitoxin in further stages of the disease; this, however, seems improbable.—Bosanquet.

Polyvalent Sera are now in general use. This name indicates that a mixture of several strains of the bacterium have been employed for inoculation, so as to ensure the best all-round and uniform results.

In the **preparation of Antiserum** the toxin is injected subcutaneously into the animal, *e.g.*, the horse, with strict aseptic precautions. Some reaction, rise in temperature and malaise occur. Further injections are made at intervals. The quantity injected is gradually increased, and subsequently the injections may be intravenous. The blood is removed from the animal by the aid of a large sterilised canula, from the jugular vein, 6 to 12 litres may be collected in sterile flasks. The clot is allowed to form by standing 24 to 48 hours, and the serum is decanted into sterile bottles after the addition, by some manufacturers, of 0·3% of Trikresol or 0·2% of Phenol.

Liquid air (*v.p* 413) is used for freezing the bacteria and rendering them capable of disintegration to obtain the intra-cellular toxins for experimental purposes.—B.M.J. i./03,681; P.J. ii./03,921.

A résumé of the state of serumtherapy after 10 years' experience.—Goodall, B.M.J. ii./04,896.

CLASSIFICATION.

The following is an analysis and classification of antitoxins, serums and vaccines :—

A. **Vaccines.**

1. **Cultivations.**

a. Containing pathogenetic micro-organisms, with toxins; such as Anthrax, one form of Cancer Vaccine, Cholera Vaccine, Coley's Fluid, Anti-Colon Bacillus Vaccine, Haffkine's Plague Vaccine, Tuberculin and T.R. of Koch, Typhoid Vaccine of Wright.

b. Containing toxins only; such as one form of Cancer remedy, Diphtheria Toxin, Mallein, Tetanus Toxin, and Tuberculin Koch (?)

2. *a.* Tissues of animals suffering from an infective disease; such as Malignant Œdema, and Rabies.

b. Fluids of animals suffering from an infective disease; such as Vaccine Lymph, and Glycerinated Calf Lymph.

*B.** "**Anti**" **Serums** = Anti-Diphtheritic and Anti-Tetanic Serums.

1. Antitoxic; such as Anti-Pneumococcic, Anti-Venene against serpents' venom, and Diphtheritic and Tetanus Antitoxins. These neutralise the toxins.

2. Anti-bacterial; these act directly upon bacteria by 'bacteriolysis'; such are Anthrax Anti-bacterial Serum (Sclavo), Cancer Anti-bacterial Serum, Cholera Anti-bacterial Serum, Anti-Gonococcus Serum, Anti-Leprosy Serum, Anti-Tubercular Serum, Anti-Rabic Serum, Anti-Streptococcic Serum, Anti-Typhoid Serum, and Yersin's Plague Serum.

C. Animal tissue extracts = Organo-therapy.

Notwithstanding our acceptance of the above (Sims Woodhead's) classification, we find it to be more convenient for purposes of reference to arrange these modes of treatment according to the diseases in alphabetical order.

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* When an "Anti" body is formed in connection with any toxins and bacteria, these substances may always be used as immunising bodies.

NOTE OF CAUTION.

The constitution, mode of preparation, and standards of strength of these serums, lymphs, and antitoxins of animal origin are still very indefinite, except in the case of Anti-Diphtheritic and Anti-Tetanic preparations. The modes of manufacture are still in process of development, and the results cannot be estimated by chemical analysis any more than by physical processes; they can only be ascertained and compared by experiments on animals or on man. Under these circumstances, the authors disclaim any intention of recommending the employment of these serums, &c., and state that physicians making use of them must at present be guided by the makers' guarantee as to strength, purity and method of administration.

Anthrax.

In the growth of the Anthrax Bacillus toxic albumoses and peptones are formed as in the case of digestion.—Bosanquet.

Attempts have been made in France, Italy, Germany, and also in Japan, to prepare an antitoxin for the cure of this fatal form of animal poisoning; experiments made at the Pasteur Institute are noted.—B.M.J.E. i./96, 23.

This vaccine is prepared by cultivating the bacillus under conditions unfavourable to its growth, *e.g.*, in the presence of an antiseptic, or at a high temperature, by which the toxicity is greatly reduced and only a temporary illness is produced on inoculating.

It has also been found that cultures of *B. pyocyaneus* will protect against anthrax.

Anti-Anthrax Serum (Sclavo's).

An Antibacterial Serum, stimulating the activity of the phagocytes. Prepared by immunisation of asses at Sienna in Italy. During the process of immunisation anthrax bouillon cultures containing gelatin are injected to prevent abscesses at the point of inoculation (Legge).—L. i./05,765,

The earlier the treatment can be commenced the more easily can the infection be combated.

30 or 40 Cc. (each tube contains 10 Cc.) should be injected in three or four injections under the skin in different parts of the abdomen. After 24 hours if there has

been no improvement either in the general or local condition further injections of 20, 30, or 40 Cc. are to be made (*i.e.*, 8 tubes in all may be required for one case).

In severe cases 10 Cc. of the serum may be injected intravenously and the injection repeated after 2 or 3 hours. At the same time serum may also be injected subcutaneously.

A rise in temperature following on the injection of the serum is to be regarded as a favourable indication.

Sometimes a rash develops three to eight days after treatment has commenced, with or without febrile symptoms. This is not peculiar to the anti-anthrax serum, but may occur after injection of any other kind of serum. If it occurs it is unimportant.

There may be a slight deposit in the serum, especially when not of recent date, but it may be used with full confidence as it is sterile and does not lose its efficacy until after two years when kept in the dark.

Technique of the Injections.—The skin may be cleaned and disinfected by rubbing first with a pledget of cotton wool dipped in ether, and then with another dipped in a 2 per 1,000 solution of mercuric perchloride. Instead of ether, soap and warm water may be used to remove the fat, but in that case all soap must be removed with warm water before using the sublimate. Ether soap, *q.v.*, is also suitable.

The syringe must be sterilised each time by boiling it (with the needle already inserted) for at least ten minutes. The injection finished, the skin should be again washed with cotton wool soaked in 2 per 1,000 sublimate, and a drop or two of collodion is applied.

For **intravenous injection** where possible one of the superficial veins at the back of the hand, distended by pressure on the forearm, should be selected. The air having been expelled from the syringe, the point is introduced into the lumen of the vein and the serum gently pressed out, pressure on the forearm being relaxed.

Methods of prevention of anthrax amongst wool-sorters.—L. ii./05,803.

Anthrax, cases cured by.—L. ii./04,89,372; L. ii./05, 473, 1329; B.M.J. i./05,16,296; ii./05,108; L. i./05, 1137, 1420.

The method has further been elaborated with a view to immunising animals against anthrax. Oxen and

horses receive injections of 5 Cc., sheep 4 Cc. simultaneously with a somewhat weakened culture of the anthrax bacillus (0·5 and 0·25 Cc. respectively).—Deut. Med. Woch, 1904, Nos. 26 and 27.

Cancer, Sarcoma, and other Malignant Tumours.

It has been asserted that cancer may be absent in certain countries. The importance of this being proved is enormous, for if this is due to some definite cause some definite step in prevention might be obtained. The Cancer Research Fund has already announced that malignant diseases are found in the cow, horse, dog, pig, sheep, mouse, cat, fowl, parakeet, giant salamander, cod-fish, gurnard, and trout. These facts have a very important bearing.

The last report of the Cancer Research Fund (B.M.J.ii,/05,96) gives details of a large volume of work. By transplanting tumours from one mouse to another, highly potent serum was produced --at least, in the test-tube. It has been suggested that to arrest the growth of the new tissue so as to prevent cell conjugation is a safe line for experimentation, whatever the cause may be. Some recent cancer researches will be found in L.i./05,983 (Handley).

Etiology of carcinoma; *Plasmodiophoræ* found in carcinomatous tumours. Culture and staining of the parasites by Ammonia-Silver, Gold and Platinum.—L. i./05,215. Beatson on.—B.M.J. i./05,920.

Carcinoma as a parasitic disease.—B.M.J. ii./05,1565.

It has been found that the structures known as Plimmer's bodies, which were considered peculiar to cancerous tissues, are also present in healthy reproductive tissues. This disposes of the idea hitherto held that Plimmer's bodies are parasitic organisms.—C.D. i./05,793.

On the nature of malignant growths.—B.M.J. i./05,1277.

Cancer, editorial on the 'age' of. There is no actual increase in death rate.—B.M.J. ii./05,594.

The Colonies and cancer research.—L. i./05,655.

Recent discussion on cancer in Berlin.—L. i./05,1160.

Various cancer cures, Editorial.—L. i./06,1187.

New Cancer Remedies—one consisted of ointment of copper and aluminium oleates (*v.p.* 505). One internal medicine of impure spirit and water, and another contained methylene blue.—B.M.J. i./06,1238.

Coley's Fluid.

Is prepared by cultivating the *Streptococcus* of erysipelas in bouillon ten days. *B. prodigiosus* is added, and the two are grown together for ten days. The culture is then killed at 60° C.

The principle of the method of treatment is the fact that malignant tumours frequently decrease after erysipelas.

Six cases of sarcoma either cured or much relieved, and 8 cases of carcinoma without a death, are described in Trans.

Amer. Surg. Assoc. vol. xii. 1894,183. Twenty-four injections by Coley into the tumour; retarding influence.—Pr.liv.377,379.

The Lister Institute of Preventive Medicine now supplies Coley's fluid in phials of 2 Cc. *Dose.*—Half a minim at first, injected near the tumour. Martindale's preparation is similar.

Note on the use of Coley's fluid for cases of inoperable cancer.—L. i./98,354; B.M.J. i/98,948.

Although no real cure was effected, yet improvement was beyond question.—B.M.J.E. ii./95,103.

Recurrent sarcoma treated by Coley's fluid, but not cured.—B.M.J. ii./98,226,451; B.M.J.E. ii./01,3.

Summary of results on sarcoma.—L. ii./98,888.

Cancroin is a toxin obtained by cultivation of the parasite *Coccidium Sarcolytes*, Adamkiewiczii. Cancroin II. is another form which is similar to Neurin.—B.M.J. ii./01,251.

Cancer Serum, Doyen's.

Doyen claims cancer is associated with *Micrococcus neoformans*. He makes cultures direct from portions of tissues removed. Tumours treated with the serum diminished in size. Enquiries are being instituted.—L. ii./04,1253,1798; i./05,644. B.M.J. ii./04,1181, 1712; ii./05,211.

A number of cases treated with the Serum. The organism of Doyen together with other micrococci often present in malignant disease. This organism, however, is not the etiological factor. Inoculation is not followed by formation of neoplasm.—L. i./06,955,961.

Investigations by Jacobs and Geets lead them to the conclusions (1) that *M. neoformans* is specific, (2) the anti-cancerous sera of Doyen are, however, useless, (3) immunisation can be effected by inoculating with *M. neoformans* vaccine. Examination of the opsonic power of the blood necessary in the course of the inoculation.—L. i./06,964.

Letter from Doyen in his defence.—L.i./05,1496; Paine and Morgan's response.—L.i./06,1637.

An immunising serum produced by mice spontaneously recovered from cancer (adeno-carcinoma of Jansen).—B.M.J. i./05,542.

Trypsin, both internally, hypodermically, and locally, has been employed. *See p.* 532.

Cerebro-Spinal Fever, or Cerebro-Spinal Meningitis. This disease recently attracted considerable attention in New York, where it was responsible for great mortality. A diplococcus, evidently *Diplococcus intracellularis meningitidis* (Weichselbaum), has been isolated from the cerebro-spinal fluid, and from the brain membrane, and the purulent exudate. It has been found in the nose in coryza and in rhinitic and ototic discharges, and so it may be advantageous to resort to

periodical ablutions of the nasal and buccal passages of the sick and their attendants. The organism resembles the gonococcus in its shape, in being intracellular, and in its non-staining by Gram's method, but has been cultivated without the presence of albumen, this marking it off sharply from the coccus of gonorrhœa. The latter is found in many parts of the body in severe cases of gonorrhœa.

It is an acute epidemic disease, characterised by profound disturbance of the central nervous system, indicated at the onset chiefly by shivering, intense headache or vertigo, or both, and persistent vomiting; subsequently by delirium, often violent, alternating with somnolence or a state of apathy or stupor; an acutely painful condition with spasm—sometimes tetanoid—of certain groups of muscles, especially the posterior muscles of the neck, occasioning retraction of the head, and an increased sensitiveness of the surface of the body. Throughout the disease there is marked depression of the vital powers; not unfrequently collapse; and in its course an eruption of vesicles, petechial, or purpuric spots, or mottling of the skin, is apt to occur. If the disease tend to recovery, the symptoms gradually subside without any critical phenomena, and convalescence is protracted; if to a fatal termination, death is almost invariably preceded by coma. After death the enveloping membranes of the brain and spinal cord are found in a morbid state, of which the most notable signs are engorgement of the blood vessels, usually excessive, and an effusion of sero-purulent matter into the meshes of the pia mater and beneath the arachnoid.

The name 'Spotted Fever' given to this disease is a misnomer, as the spots are by no means constantly in evidence.—M.A. 1906,557.

A case in which the diplococcus was found in the meningeal fluid.—B.M.J. i./05,989.

Other organisms in.—See B.M.J. i./05,953.

The present treatment is by antipyrin, phenacetin, and opium.—B.M.J. i./05,71.

Anti-meningococcus Serum is supplied in 25 and 50Cc. vials.

Still's Diplococcus resembles the *Diplococcus intracellularis meningitidis*, probably only an attenuated form.

For an abstract of a lengthy monograph on this disease *see* L. i./06, 1200.

An account of the Weichselbaum Diplococcus.—L. i./06,1248.

Cholera.

This disease is marked by the presence of the *Spirillum choleræ*. The prophylactic vaccines of Haffkine have been used with success in India. They are—

(1) weak, (2) strong, by employing a growth of the spirillum the virulence of which has been increased by growth in the peritoneal cavity of guinea-pigs. The dose of these preparations is 1 Cc. The second is injected 3 to 5 days after the first (the weak) one.

Haffkine's summary of results in India, 1893-4.—B.M.J. i./95,219; L. ii./95,999; ii./96,171.

Editorial notes on cholera antitoxin treatment.—L. ii./96, 395,631,1246,1266.

Lord Lister's address on preventive inoculation.—B.M.J. ii./95,1609.

Cholera, yellow fever, and Plague Regulations and Aliens Act, 1905, considered in relation to prevention of spread of these diseases.—L. ii./05,1891.

Anti-Cholera Vaccine (Kolle) is supplied in 1 and 5 Cc. vials. *Dose.*—1 Cc. A standardised emulsion of the killed bacilli with 0·5% Phenol. Some malaise and fever may result on injection; a second doset o be given after ten days. Macfadyen has produced an anti-serum, employing goats.—B.M.J. i./06,507.

Anti-colon Bacillus Serum. *Dose.*—10 Cc. or more. Is prepared from horses which have been immunised against a number of types of *B. coli* principally from cases of peritonitis and puerperal fever. Supplied in 25 and 50 Cc. vials.

The action of this serum is chiefly bactericidal, though also possessed of antitoxic properties.—L.i./06,71.

Anti-Colon Bacillus Vaccine is also prepared.

Diphtheria Antitoxin. Serum Antidiphthericum. P.G. iv., U.S., F.E.; will find a place also in French Codex of 1907.

That of P. Belg. must be marked with the name of the maker, date, and rotation number, also the number of units per Cc. in the vial. Keep in the dark in a cool place.

Preparation.

This remedy for diphtheria consists of the serum of horses, previously rendered incapable of taking the disease, or of a principle—antitoxin—separated from it. These horses are immunised by the injection of the toxin of diphtheria, which is produced by the culture of the *Bacillus diphtheriæ* in broth in ordinary ½ litre Erlenmeyer-shaped flasks—a surface growth is important—the liquid becoming sufficiently active in 10 to 14 days, the most virulent strain obtainable must be used: this broth culture is then filtered through a Chamberland filter and the horses are injected with the clear fluid commencing with ½ to 1 Cc. The animals must initially be carefully examined for absence of glanders and tuberculosis. Repeated injections during 4 to 6 months of increasing quantities of toxin up to as much as ½ or 1 litre render the serum of a high antitoxic quality; the horse does not show any sign of illness

during this process. The efficacy of the remedy is tested by injecting guinea-pigs with a dose of the serum *pari passu* with an injection of diphtheritic poison. When the horse's serum is found to have reached the stage at which this combined injection leads to no symptoms of diphtheria, it is considered to have attained the required potency. The horse is bled about 10 days after the last injection, and the serum prepared for use as a remedy, and as a prophylactic.

The horse from which this perfected serum is obtained is then found to be itself safe from possible diphtheritic infection, and if this perfected serum be added to a fluid containing diphtheritic toxins they become harmless.

This serum combats the disease in the human subject.

Examined microscopically it should not show presence of any micro-organisms.

Martin described the diphtheritic toxin as a series of albumose bodies.

In a case of suspected diphtheria it is well to inject the antitoxin *at once* without waiting for the result of the bacteriological diagnosis; no harm can result from so doing.—Hewlett.

The dose of diphtheria antitoxin at present is considered to be at least 1,500 *units,* 2,000 *units may safely be injected whether in the case of a child or adult, frequently much more is injected. For prophylactic purposes* 500 *or* 1,000 *units may be administered; Lister Institute says* 200 *units (approximately* 1 *Cc.). The immunity caused is claimed to last for* 3 *weeks. Bosanquet favours the prophylactic use of* 300 *units for a child and* 500 *for an adult. Some authorities recommend that the serum should be warmed by standing in water at* 40° *C. for* 10 *minutes before injection. Care must be taken not to inject air at the same time.*

Serum Antidiphthericum, U. S.

The standard of strength in units of antitoxic power is controlled by U.S. Public Health and Marine Hospital Service. *Average dose.*—3,000 units. Immunising dose for healthy persons, 500 units.

F.E. requires a minimum content of 200 Ehrlich's units per Cc., *i.e.*, 1 Cc. shall be capable of neutralising

20,000 lethal doses of fresh diphtheritic toxin. According to this Pharmacopœia the *minimum* immunising power must be 100,000 units.

It is much safer to give too many units than too few. The injection should be made as early as possible in the case and repeated once or twice. It would appear to be harmless, as many as 35,000 units have been given in a single dose and 82,000 units in three doses intravenously.—P.J. ii./03,794.

The Solid Anti-Diphtheria Serum, F.E., is prepared by evaporating *in vacuo*. *Vide p.* 768.

Repeated small doses advocated, also used in scarlatina with admirable results.—B.M.J., i./06,376.

In conducting the injection the syringe and needle should be thoroughly sterilised by boiling. Special antitoxin syringes, preferably of glass, are made for the purpose. The needle need not be of large bore as the serum is not by any means thick, and the wide needles are obviously much more painful. The skin must be carefully cleansed with Ether Soap solution. Injections are preferably made in the flank or between the scapulæ. No dressing is needed after the injection.

Units of Immunity.

The Ehrlich-Behring Unit refers to the toxin **neutralising power** of serum, not to the volume of the liquid. A normal serum is prepared for comparative purposes; 1 Cc. of this contains 1 unit of immunity, and 0·1 Cc. of it neutralises 1 Cc. of normal standard toxin.

The strength of sera are ascertained by physiological tests on guinea-pigs weighing, as near as possible, 250 Gm., using mixtures of different quantities of the serum, and a lethal test dose of standardised toxin. The neutralising point is indicated by the animal's death being prevented on the fourth day.

In standardising, Hewlett suggests that the exact amount of the toxin be ascertained which, when mixed with the unit of antitoxin, just suffices to cause the death of a 250 Gm. guinea pig on the 4th or 5th day. This amount is termed the L+ dose (L = *Limes* boundary, *i.e.*, between life and death), the neutral point L+ meaning that there is one lethal guinea pig dose of the toxin left unneutralised by the limit of anti-toxin. The amount of toxin in question is then mixed with varying amounts of the antitoxic serum to be tested and injected into 250 Gm. guinea pigs.—Hewlett, P.J. ii./04,377.

The Thirteenth International Congress of Hygiene and Demography which met in Brussels, February, 1905 discussed :—

(1) the mode of action and origin of the active substances in antitoxic and preventive sera; (2) the best methods of measuring activity; (3) the value of diphtheria antitoxin as prophylactic. The Comptes rendus of the Congress are published in book form.

Preservation. The serum retains its activity for 10 months if kept in a cool and dark place.

In addition to the liquid sera, **Dried Serum** in amber coloured scales is manufactured by evaporation at a temperature not exceeding 40° C., or by means of Sulphuric Acid *in vacuo*. This is more suitable for export. The scales are dissolved in sterilised water. It is not soluble in hot water (above 50°C) nor in alcohol. The directions given by each maker should be followed.

The Lister Institute of Preventive Medicine now supplies diphtheria antitoxin dry in tubes of 4,000 units, and fluid in vials of 2,000 units.

By injecting direct into the circulation **intravenously** brilliant results have been obtained, the toxin circulating in the blood is apparently much more effectually and rapidly neutralised.—P.J. ii./03,795; L. ii./02,1685.

Advantage of intravenous method questioned.—L. ii./04,1776. For this method either complete anæsthesia or cocaine anæsthesia is necessary. The vessel must be isolated, incised, and the blunt needle introduced, and tied in position and the antitoxin, warmed to body temperature, slowly injected. Ligature either side of the incision if any sign of bleeding; due care must be taken to avoid introducing air bubbles.—Bosanquet.

Of **complications** following injection—if abscesses and septic infection occur the serum may have been contaminated, yet hæmorrhage occurs occasionally. Albuminuria is less frequent under antitoxin than formerly. As higher potencies are now used, and the quantity of serum injected is therefore less, rashes, pain and swelling are also less frequently reported. For summary *see* Pr. Lx. 371; L. i./99,891; also Bosanquet, *p.* 92. Calcium chloride is said to relieve the rash, pain, &c.—Hewlett.

References.

The earliest report of the use of the antitoxic serum is found in the Deut. Med. Woch. of April 27, 1893; this is noted in B.M.J.E. i./93,83. Behring and Kossel were the investigators; they give notes of 30 cases of diphtheria, so treated, of which 24 recovered, or 80%.

First English reported case by Eastes, 5 Cc. of Aronson's preparation in a child of 10 years, with recovery.—B.M.J. ii./94,125. Second Case, *p.* 180.

Post-diphtheritic paralysis is said to have been on the increase since introduction of antitoxin treatment, but this is not propter hoc. Antitoxin has, on the contrary, some power in restraining. Does not, however, neutralise the toxic material causing paralysis.—Bosanquet.

Recommended use for diphtheritic ophthalmia.—L. i./96,712; B.M.J.E. ii./96,35,83; L. i./97,1606.

Diphtheria attacked a wound and produced death by systemic poisoning.—L. i./05,1130.

In nasal diphtheria, large doses of antitoxin are called for.—Bosanquet, *p.* 98.

In middle ear disease following scarlatina in which Diphtheria Bacilli appear the antitoxin is neither prophylactic nor curative.—Jl. Path. and Bact. 1903.

A tabulation of the results of the Antitoxin treatment of laryngeal diphtheria.—M.C., March, 1898,445.

Contaminated with the toxins of tetanus and has caused fatal results.—B.M.J. i./01,228,293,417; ii./01,1622.

Saline injection as an adjuvant —L. ii./01,1131.

St. Louis, U.S.A., thirteen deaths from tetanus after diphtheria antitoxin.—L. i./02,996.

Sudden death may follow injections.–B.M.J.i./02,1025.

Oral and Rectal Use of Antitoxin.

Antitoxin serum is also efficacious when given by the mouth or rectum. — L. i./01,400,971; B.M.J. i./01,1142; L. i./04,123; B.M.J. ii./04,175.

Antitoxins should not be given *per anum* or *per os.*—Hewlett, Lecture on Antitoxins, P.J. ii./04,888; B. & C.D. ii./04,549. Faith in oral administration.—B.M.J. i./06,379. Doubt as to conclusions to be drawn.—B.M.J. i./06,738.

Paton draws attention to the possible cure of diphtheria by the oral use of serum in same dose as would be used hypodermically. Many cases of success with oral use in diphtheria are reported by him.

He has recently published clinical results of his experience with anti-diphtheritic serum and with anima plasmata. He has given the former for septic infections of all kinds in doses of 1 drachm orally four times daily. Using a dilute serum of which 1 ounce equals 6,000 units; and narrates cases of erysipelas, quinsy, pleurisy

with effusion, nephritis, and cerebral meningitis treated by this method; giving also in malignant disease oral and hypodermic doses of this serum. Appendicitis has been treated by the rectal use of the same. He enters fully into his theories of the action of serums orally administered, and explains the action of simple plasmata in deficient nutrition and in tubercular infection.—M.P. 1905.

Dysentery.

Shiga in Japan has prepared anti-dysenteric serum from the horse, and claims to have reduced the mortality of epidemic dysentery.—B.M.J.E. ii./01,36.

Preliminary experiments on the production of an antitoxin to cure dysentery.—B.M.J. ii./03,1456.

The Lister Institute supplies anti-dysentery serum consisting of the serum of horses which have been immunised against the dysentery bacillus (Shiga aud Kruse), and the toxic substances elaborated by the bacillus. It is preserved with Phenol 0·3% in 20 Cc. vials.

Dose.—Preventive 20 Cc. subcutaneously; curative from 20 Cc. upwards subcutaneously according to severity. Pains and temporary rashes may result which need, however, not alarm.

The Serum treatment has lately been more extensively tried, but results are on the whole not convincing. Serum used in three cases with best results.—B.M.J. i./06,680.

Anti-Gonococcus Serum.

Dose.—20 Cc. Is supplied in 25 and 50 Cc. vials; is really a polyvalent anti-streptococcic serum.

Results in gonorrhœa. The normal dose of 20 Cc. was doubled.—L. i./06, 1244.

Leprosy.

A preparation termed Leprolin has been made by Rost at Rangoon by cultivation of *B. Lepri* six weeks in Pasteur flasks in a medium consisting of the distillate from beef—absence of chlorine salts essential—after the manner of the original Koch's Tuberculin. Injections produced marked effect causing sensation to return in the anæsthetic patches. B.M.J. i./05,294. Discussion L. i./05,669. Use unsatisfactory, B.M.J. ii./05,600, C.D. i./05,402. The presence of *B. leprae* in the mosquito (*Culex pungens*) and in the bed bug (*Cimex lectularia*) has been shown.—L. i./06,1347.

Malaria (*c.f.* also *p.* 869).

To combat malaria in India and other places where it is prevalent it is necessary:—

(1) To improve the surface drainage and prevent the formation of puddles where the larvæ can breed, also to remove the vegetation surrounding such, and for the wealthy to do away with or cleanse weekly the ornamental waters in their gardens. Smoke is a wonderful protector against malaria, and it is customary in certain parts to burn dung and such-like during the night in huts and stables.

(2) Protection by means of wire gauze.

(3) Distribution of quinine (quinine is distributed gratis by the country pharmacists to the poor in Italy).

The young Culex larvæ have been proved to survive desiccation for several months. Certain of the adult culices (*Culex impellans*) appear to prefer to attack birds rather than human beings, the avian blood being recognisable on dissection of the insect.

It is a remarkable fact that so far inoculation experiments on all animals excepting man have proved unsuccessful, and in the case of man the inoculation should be intravenous. Experimenters have found, however, that malaria can be produced by allowing infected mosquitoes to bite healthy individuals.

The Anopheles larvæ are easily found in the winter in sun-exposed, grass-surrounded pools in the infected districts in India.

The method of killing the larvæ, and, indeed, all other water insects, beetles, &c., is to pour common kerosene on to the surface with the aid of a sprinkling water-can. This forms a scum, which prevents the larvæ from breathing the atmospheric air. They die and sink to the bottom, or are washed up on to the banks in countless numbers. Thirty pounds of oil, costing perhaps 2s. in India, will cover at least 2,000 square yards of water ; the dose of paraffin should be repeated about 20 times during the year.

Rice cultivation with the necessary stagnant water is no small source of increase of malarial disease.

Major Ronald Ross, in a recent address, states that in spite of all ascertained facts *re* malaria, in spite of the parasite having been cultivated in the insects over and over again, in spite of the infection having been produced experimentally in men and birds by their bites, &c., &c., not one in 20, even in malarial districts, believes the theory. Extirpation of mosquitoes in tropical countries needs Government action.

There remain a few difficulties to settle in the mosquito theory, *e.g.*, how it comes about that the proportion of infected mosquitoes reported in a certain district was only 1·6%, whereas the percentage of natives suffering from the disease was as high as 48·5%. Again, large tracts of land in Erythrea have no human inhabitants. It is possible to contract malaria by sleeping there in the open for a single night ; how does the insect causing that infection (which it undoubtedly does) become infected ?

Malaria modifies the effects of drugs, *e.g.*, Belladonna cannot be given to a person impregnated with malarial toxins Similarly, it seems to confer an immunity to certain other disease organisms, *e.g.*, tubercle bacilli.—C.D. i./06,205.

Malta Fever, Immunisation Experiments suggested.—B.M.J. i./06,999. Incubation period of,—B.M.J. i./06,975.

Mediterranean Fever in South Africa. Agglutination tests withemulsion of *M. Melitensis*.—B.M.J.i./06,976.

Mallein.—A growth of the glanders bacillus in glycerinated broth. May find a place in Codex 1907.

This vaccine toxin is used as a test for the presence of glanders in sick horses, and has been injected for the cure of chronic glanders in man. The Mallein of the Lister Inst. Prev. Medicine for animals is injected in dose of 1 Cc.

for diagnostic use subcutaneously in the neck over vertebræ about midway between jaw and shoulder; complete reaction is a rise in temperature of 2·7° F. after 12 to 20 hours and an extensive hot and painful local swelling.

Systemic disturbance, such as prostration, loss of appetite, shivering, etc., may occur. These symptoms, when present, are more or less persistent.

The reaction is unreliable in all cases in which the temperature at time of inoculation is 2·5°F. above normal. In such cases, if there are any suspicious clinical signs to assist, reliance may be placed on the occurrence of the local swelling.

Mallein is supplied in 3 Cc. bottles.

Glanders in the horse and man, lecture on. Mallein not recommended for the human being.—L. i./06,223.

The Plague. For the treatment of plague there are: 1. **Yersin's Curative Serum,** also used as a prophylactic. 2. **Haffkine's Prophylactic Fluid** against plague. This contains the dead bodies of the bacilli as well as the products of their growth. 3. **Lustig's Anti-plague Vaccine.** The two last are killed cultures of *Bacillus pestis.*

Yersin Curative Serum of the Lister Institute is sent out in 20 Cc. bottles. 20 to 40 Cc. is a curative dose. 10 Cc. is given as a preventative. The Yersin Serum may be prepared by cultivation of a virulent growth of the bacillus obtained from several epidemics. An emulsion of the growth on physiological salt solution is injected intravenously into the horse in gradually increasing amount—the first few doses having the bacilli killed by heat. Bleeding takes place a fortnight after the last dose. The serum is finally tested for efficacy.

Haffkine's Prophylactic Anti-plague Fluid of the Lister Institute is supplied in cartons of 21 Cc. The adult dose is 3 Cc., and a child's dose is 1 Cc. Protection is afforded probably for three months.

Lustig's Anti-plague Vaccine is sold in 21 Cc. packages; this quantity is sufficient for three administrations intravenously.

Injections are recommended to be made into that part of the skin drained by the lymphatics leading to the bubo.

Report of the Indian Plague Commission; the Anti-plague vaccine is still recommended, but its effect is not certain. Its use lessens the death-rate, and also the proportion of the people attacked. The protection afforded is not immediate, and does not certainly last many weeks.—B.M.J. i./00,455,461; L. i./00,567,724.

Lustig on curative and protective inoculations.—B.M.J. i./01,206; ii./00,311,1236.

A special Plague number of the B.M.J., Oct. 27, 1900.

Deaths from plague in India in the first three weeks of April, 1904 (April is the worst month) amounted to 46,320; 47,759; 46,812. In the week ending March 11th, 1905, they were 45,000. During the weeks ending December 30th, 1905, Jan. 6th and 13th, 1906, they were 3,282, 4,278, 4,240—showing marked decrease in comparison with corresponding period in previous year.—B.M.J. i./06,349.

Results with Yersin's and Lustig's Serum and others disappointing, but points in favour.—B.M.J. i./06,644.

Plague in Madeira.—B.M.J.i /06,159.

Review of 30,000 cases of preventive (Haffkine) inoculations in the Punjaub, India; a case mortality of 16·9 against 45·2 of uninoculated persons.—L. ii./03, 1646,1647.

Klein's Propbylactic.

The organs of various rodents killed by plague were minced and dried over warm Sulphuric Acid, and were then powdered. The material contained no living *Bacillus pestis* but was rich in powerful plague toxin. Warm water emulsion of this was strongly prophylactic. The preparation is easily made and standardised, and is cheap. Protection lasts for weeks. Injections of clear filtrate from solution of 20 mgr. of dry powder renders an adult rat immune to infection.—B.M.J. i./06,156; P.J. i./06,104.

Pneumonia.

An Anti-pneumococcic Serum is recommended by Pane, of Naples. Report from Guy's Hospital; it protects from pneumococci obtained from two different sources.—L. i./99,954.

Here again the Serum should be "polyvalent." It is produced by inoculation of the horse with a broth culture, during a prolonged period.

A dose of 20 to 30 Cc. may be administered hypodermically twice daily. The serum gave best results when recently prepared. Acute pneumonia has also been treated with success by injections of Diphtheria Antitoxin.

A case of empyema well treated with pneumococcus *vaccine*.—L. i./05,1718.

Endocarditis treated with anti-pneumococcic serum.—L. i./05,1333.

Has acted well in pneumococcic infection of the eye. Suppurating corneal ulcers heal quickly under the treatment.—M.A., 1906,50,167.

Rabies Antitoxin, for Hydrophobia.

Negri's bodies have been found in the brain of rabid animals. If these are found to be constantly present their detection will prove a valuable and rapid method of diagnosis.

Pasteur founded the system of treating rabies by the injection of an anti-rabic virus. The virus, after passage through a series of rabbits, has its toxicity increased for these animals, but it is rendered less toxic for man.—Bosanquet. It was also used as a prophylactic injected into persons bitten by mad dogs. Many successful cases were reported, but it has been asserted that hydrophobia has been caused by this method.

Report of the Pasteur Institute, Paris, for 1897; 1,521 cases treated, 8 deaths.—B.M.J. i./98,1305. Results in the U.S.A.—B.M.J. i./02,1295.

To be injected into the abdominal subcutaneous tissue.—M.A. 1906,51.

Rheumatism.—Menzer, of Munich, has recommended an **anti-rheumatic serum** which gives relief in cases of chronic rheumatism when there are no adhesions, but causes pain and inflammatory reaction in cases of acute rheumatism, and when there are any fibrous adhesions. Menzer considers rheumatism to be due to a form of streptococcic infection, and that the local pains and swellings are due to congestion of a reparatory nature. His serum is a Polyvalent Anti-streptococcic one, it produces a less rapid but more sure cure than the Salicylates, and there are less heart affections. He gives a dose of 5 Cc.; in chronic cases one dose every two or three days. It is not to be used when there is pericardial or pleuritic effusion.

Septicæmia, Anti-Streptococcic Serum, and Antistaphylococcic Vaccine.

Staphylococci and *Streptococci* have a peptonising effect on the tissue, killing the cells.—Bosanquet.

Special Anti-streptococcic Sera for use in **Erysipelas, Puerperal Fever, Scarlatina** (*v.p.* 777), **Endocarditis** and **Rheumatic Fever**, are obtainable commercially.

Anti-streptococcic Serum is prepared by injecting cultures of *Streptococcus* into the horse. It is an antibacterial serum and should be a polyvalent one. Its keeping qualities are not marked; it should, therefore, be freshly prepared.

For the many forms of fevers due to, and associated with septicæmia a variety of preparations have been in use. Puerperal fever and the varied forms of septicæmic infection following child-birth have been treated in many instances by this serum with good results.

The organism responsible for erysipelas and allied affections is the *Streptococcus pyogenes*. This organism produces little toxin in cultivating media, hence the culture itself is employed. Initially the virulence of the organism is increased by passage through a succession of animals.

Suitable cultures are then prepared in mixtures of horse serum and broth or Aronson's special horseflesh bouillon, and the horse is gradually immunised with this culture. Finally (the process is long and tedious), a dose of 100 to 200 Cc. is reached. The horse is bled and the serum standardised. Not more than 0·5 Cc. of serum should be necessary to neutralise 10 minimum lethal doses of the *Streptococcus* when injected simultaneously into a rabbit.

Watson Cheyne has suggested the **prophylactic** use of this serum before operations on the mouth and throat, 10 Cc. daily, three times.

The Anti-streptococcic Serum, prepared by the Lister Institute of Preventive Medicine, is supplied in a liquid state in cases of three phials, 10 Cc. in each.

Dose.—30 Cc. in any form of septicæmia, and repeated daily till marked improvement occurs. Injections should be made at the seat of inflammation, &c., if any, as in erysipelas, so as to produce good local effect.

It has been suggested that a few doses of 10 to 20 Cc.

should be given in any septic infection. It should be realised that such infection may be due to a series of organisms which will not be attacked by one which is purely anti-streptococcic.

Must be given early, in 20 Cc. doses at least twice in 24 hours in severe cases.—L.ii./04,1829; B.M.J. i./05, 582. In simple septicæmia or sapræmia, good results.—L. ii./04,1213.

Erysipelas recoveries.—L. i./98,502; ii./04, 1211; B.M.J. ii./00,18; i./01,575,1079.

Landry's palsy followed its use.—L. i./96,1033.

Use in endocarditis.—L. ii./96,1079,1264,1339; i./97,520; ii./97,92,707; i./03,720.

Puerperal fever, recoveries under serum.—B.M.J. ii./01,810; ii./03,1210; Therap. Monats. 1904,509; M.A. 1906,51; L. ii./04,1829 (Foulerton); a special Serum. Rost. L. ii./04,1830.

Ulcerative endocarditis treated, recovery.—B.M.J.E. ii./98,3; L. ii./00,168. Rectal injections, ten doses of 10 Cc. daily.—L. i./03,1268; B.M.J. i./03,1195.

Is of use in carbuncle.—B.M.J. ii./98,1427.

Variola treated by serum, the critical period was shortened, the toxæmia and collapse less.—B.M.J. i./99, 1144.

Infective endocarditis, death after treatment by serum.—L. i./99,1558; ii./99,1225.

Obstetricians have derived no benefit from this form of serumtherapy.—B.M.J. ii./99,967.

Pyrexia of phthisis, use not desirable.—B.M.J. ii./00,1158.

In septic inflammation of the throat.—L. i./03,438.

Acute rheumatism, daily injections of 20 Cc. into affected joints with some success.

Arthritis relieved by 10 Cc. doses.—L. ii./05,965.

Large doses of Anti-Streptococcic Serum advocated in threatened uterine infection.—M.A., 1906, 299.

General Staphylococcic infection, a case of; Serum and Hetol employed—death.—L. ii./05,521.

Anti-Staphylococcic Vaccines (Wright's) are also supplied by the Lister Institute in ½, 1 and 2 Cc. vials. (*a*) Made with *Staphylococcus aureus* alone. (*b*) Made with mixed cultures of *Staphylococcus aureus*, *citreus* and *albus*, in tubes of 1 Cc. and 2 Cc.

A vaccine for carbuncles and boils.—B M.J. i./04, 1075.

Similar Vaccines, *Martindale*, have been successfully used for acne, furunculosis, sycosis menti, suppuration within the antrum and frontal sinuses. They are supplied in $\frac{1}{2}$, 1 and 2 Cc. vials.—B.M.J. ii./05,562; Odonto Trans. 1906 (Kenneth Goadby).

Special Vaccines are prepared for individual cases.

Scarlatina.—Moser has introduced at Vienna a Serum prepared by the inoculation of horses with the products of cultures of streptococci, which he had found in the blood of 60% of fatal cases of scarlatina. All children treated within three days of infection recovered.—B.M.J. ii./02,1086; M.A. 1904,36.

Anti-streptococcic Serum in scarlatina.—B.M.J.E. i./05,83.

Scarlet **Fever Serum** has been manufactured through agency of three forms of streptococci. The specific organism of scarlet fever is said to be *Streptococcus conglomeratus*. Results gratifying.—M.A. 1906, 51,52.

Is probably due to a species of streptococcus. Ordinary anti-streptococcus serum did some good, and a special American preparation has benefited a number of cases.—Montreal Med. Journal, Oct.1902,753.

Serpent Venom. Anti-venene. May find a place in Codex 1907.

In the preparation of this serum the venom is removed either from the living snake or after killing it. This venom is mostly desiccated over sulphuric acid *in vacuo* and a weighed quantity of this is dissolved in sterile water and injected into the horse. The increase in dose proceeds very gradually, the final dose appears to be about 0·6 Gm. of venom, equivalent to the entire yield of 20 average sized snakes. The serum is removed in the customary manner and standardised.

Calmette showed that the venom of all snakes is of a similar nature, and obtained his remedy by the inoculation of horses with the poison of the cobra di capello: his serum possesses a strength of 1 in 20,000; that is to say $\frac{1}{10}$ Cc. subcutaneously injected into a hare of two kilos in weight suffices to protect it from snake poison which kills a similar hare in eight hours.

It is claimed that anti-venomous sera are specific even between the venoms of species of the same genus. An account of the serum therapeutics of a number of cases.—L. ii./04,1273.

Classification of snakes and discussion on poisons.—Bosanquet, 120.

On the venoms of different snakes.—L. i./06, 1231.

Dose.—Anti-venene is supplied in tubes of 10 Cc. This amount or as much as 40 Cc. should be injected. The serum should be as fresh as possible. (As much as 400 Cc. intravenously and 10 or 20 times that amount, if subcutaneously, for cobra poisoning.—L. ii./04,1273.) The injection requires to be made at once, or within an hour in man; death seldom occurs from serpent poison under three hours.

A ligature must be bound above the bite if possible. The wound should be opened up and washed with Chromic Acid or Gold Chloride 1% solution.

Fraser on anti-venene and the cure of snake poisoning.—B.M.J. ii./95,416,1165; i./96,957; L. i./96,1156.

An editorial article on Calmette serum.—B.M.J. ii./96, 405. Its effects.—Pr. lxx., 576.

Results at Calcutta.—L. ii /04, 670.

Recoveries under anti-venomous serum.—L. ii./99, 1438; B.M.J. ii./99, 1412, 1732; L. ii./01, 1135.

Serpents' bile appears to be an antidote to serpents' venom.—B.M.J. ii./97,125,295. 'A preparation of snakes' liver for snake bite.—B.M.J.E. ii./04,68. Also to some disease toxins as of tetanus and diphtheria.—B.M.J. ii./98,627.

Calmette, his own report on the work in laboratory at Lille, and insists upon the need of suiting the dose to the size of the animal operated on.—B.M.J. i./98,1253.

A criticism on Calmette's views on the use of his serum, referring to West Australian snakes.—B.M.J. ii./98,1805.

The neutralising power of Calmette's serum.—B.M.J. i./99,781; ii./99,660.

On snake poisons and antitoxins.—B.M.J. ii./03,1546.

Calmette bitten by snake and treated by his serum.—L. ii./01,622; his finger cut off, however.—B.M.J. ii./01,1450. On Sea-snakes, venom.—Fraser L. ii./04,141.

Syphilis.

The old treatment by syphilisation was originated by Aazias Turenne and supported by Boeck.

Recent experiments on the cure of syphilis by animal fluids have not given promising results.

For *Spirochæta Pallida* see Bacteriological Notes.

Tetanus Antitoxin, P. Belg. (with potency left to the manufacturer; may be in Codex, 1907.)

In the absence of anti-tetanus serum the injection of 3% *phenol solution should be tried.*—M.A.1904,72.

Preparation.

Tetanus toxin is in many respects similar to a soluble ferment. It is precipitated by alcohol and tends to adhere to precipitates. It is modified or destroyed by the air, sunlight and comparatively low temperatures.—Dean, Quain's Dict. Med. 1902,*p.*1688.

The method of preparing this antitoxin consists in rendering animals immune to the tetanic poison by repeated inoculations with increasing quantities of the

tetanus toxin. This toxin is produced by cultivating the tetanus bacillus strictly anaërobically in a 1% grape sugar bouillon. The culture is ready for use in a month. This may be weakened to commence with by the addition of Gram's Iodine* solution at the time of injection. The injections are proceeded with until the serum of desired immunity power is reached. At this stage the animals are bled, the serum is collected, is concentrated and dried *in vacuo*, and the residuum (the antitoxin) is supplied in sealed tubes for use in the human subject. For preservative purposes 0·5% of Phenol is added by some manufacturers.

The Antitoxin must be administered without a moment's delay where there is the slightest suspicion of tetanus; no harm will result if tetanus does not occur.

Dose.—20 to 30 Cc. should be given subcutaneously at the outset followed by 10 Cc. every 8 hours or so. If time has elapsed it is better to give 10 Cc. intravenously, and 20 Cc. subcutaneously, with further doses every 8 hours as before. *See also* Intracerebral Injection, *p.*781.

Potency.

The Lister Institute supplies liquid Antitoxin in 10 Cc. bottles, and dried Antitoxin in tubes of 1 Gm. =10 Cc. liquid. The Pasteur Institute of Paris supplies the Antitoxin in the same forms.

The Lister Institute now recommends large doses of the serum, See full directions supplied with the packages.

At least 100 Cc. should be given subcutaneously, repeated on 2 following days, with a final injection 10 days after. A prophylactic dose of 20 Cc. is advised for lacerated wounds especially when soiled with earth.

This Antitoxin should possess a potency of at least 1,000,000 Roux units; 1 Cc. should protect 1,000,000 Gm. of guinea-pig against the minimal lethal dose of tetanus poison.—Hewlett.

Behring's standard is arranged thus:—The test toxin is prepared of strength 0·01 Cc.; it will kill a guinea pig 500 Gm. in 4 days. This is neutralised by $\frac{1}{1000}$ unit of Antitoxin, *i.e.*, one unit will protect 1,000 guinea pigs against the minimum lethal dose.—(*c.f.* Diphtheria Antitoxin). The Roux standard is considered too weak.—Bosanquet.

The general result has been to show that in acute cases, supervening at once on an injury, the antitoxin has

* Or by Iodine Trichloride.—Bosanquet.

been useless; but that in cases where the onset is long delayed the antitoxin does exercise a controlling influence and such cases generally recover under its use.

The *incubation period* is variable in man. Symptoms may appear in 4 or 5 days, or may be delayed for months. If onset rapid, the symptoms are more acute and the prognosis is the more grave.—Bosanquet.

Treatment of Wound.

In addition the wound, if any, should be excised or scraped out and swabbed with Gram's Iodine Solution. Amyl Nitrite in capsules is valuable for checking the dangerous spasms of the glottis and respiratory muscles.

Bromide and Chloral may be necessary and full doses of liquid are advised.

For **veterinary use** the Lister Institute supply special instructions.

A horse injected with Tetanus Antitoxin is not rendered *permanently* immune. *Protection* is a matter of weeks or months at the outside. The dose is according to severity, injury and likelihood of infection. Injections would probably cause some malaise, and it would be inadvisable to work the horse for a day or two.—Sims-Woodhead—February, 1902.

Tetanus, a case recovered after antistreptococcic cerebral injection and lumbar eucaine injection.—B.M.J. i./06,1340.

Heat appears to be the most energetic of the conditions which favour the development of tetanus. Recent results from animals.—B.M.J.i./06,108.

Statistics of tetanus in England for twenty years.—B.M.J. ii./94,672.

Rheumatic tetanus cured by antitoxin.—B.M.J.E. ii./97,71. Results in puerperal cases.—L. i./01,1201.

Recent successful cases.—L. ii./01,729,1266; B.M.J. ii./02,290; L. i./04,652; B.M.J. i./05,183; M.A., 1906 53.

Recent deaths after Serum.—L.ii./01,1040; B.M.J. ii./01,1529; i./02,654; L.ii./03,457.

Dry pulverised Anti-tetanus Serum as a Wound Dressing.—Is also recommended to be dusted on to wounds which may have become infected with dust, mud, &c. Tetanus may also result in newborn children owing to infection in the umbilical cord

after birth; this may be prevented by dusting the powder on the part in addition to antiseptic dressing.

A specially strong serum, made by dissolving the dried serum in half the usual quantity of water, is recommended.—N.Y. Med. Jl., Dec. 7, 1898.

Intra Cerebral Injection of the Anti-Tetanic Serum.

Anti-Tetanic Serum is also injected into the skull; intra-cerebral, or sub-dural that is, beneath the dura mater of the brain and into the spinal canal. A blunt needle is recommended. The first experiments were made in Paris, in 1898; recovery followed in the first case.

Recently this treatment has been used in addition to the ordinary subcutaneous injections.—B.M.J.E. i./99,27.

Recoveries after intra-cerebral injections.—L. i./99, 1290; ii./99,89; B.M.J. i./99,10,826,1333; B.M.J.E. i./99,27; B.M.J.E.ii./01,63; L.i./02,227; L. i./04,642; B.M.J.ii./04,1696; L.ii./04,1695; L.ii./05,880.

Deaths following intra-cerebral injections.—B.M.J.E. i./98,76; i./99,83; B.M.J. ii./99,1413; L. i./99,870; i./00,1420.

Tick Fever. This is evidently relapsing fever, and the spirochete is *S. Obermeieri* (not yet certain, however). —B.M.J. ii./04,1453; i./06,680; M.A. 1906,88.

The spirillum has not yet been cultivated, but it is suggested that it may be a stage in the life history of trypanosoma (?).—Jl. Trop. Med. 1904,24.

Suggested to designate the spirochete of African Tick Fever *S. Duttoni*. Differs from that of New York.—L. i./06,1690.

Trypanosomiasis or Sleeping Sickness.

This disease is endemic on the West Coast of Africa, notably in the Congo basin. It is believed to be caused by the entrance into the blood and cerebro-spinal fluid of the parasite *Trypanosoma Gambiense*. It causes a complete dislocation of the brain functions, a slow inflammatory process goes on in the brain cells for years, gradually the individual becomes languid in the extreme, he has not physical energy enough to walk, speak or even feed himself. The trypanosome of Gambia was first named and described by Dutton, who lost his life in 1905 in West Africa whilst engaged in his work on this disease. The blood or cerebro-spinal fluid of an infected

person has been injected into a monkey with result that the animal died with all the symptoms of sleeping sickness. It is transmitted from the sick to the healthy by a tsetse fly (*Glossina palpalis*) and not by other biting flies (*Stomoxys*). In the stomach of this fly the trypanosome multiplies by fission. The parasite was discovered by Castellani in Uganda, but an Englishman, Dr. Adams (1901) first entertained the idea that sleeping sickness was caused by Trypanosomes.

For staining the organism.—*See* Bacteriological Notes.

For medicinal treatment: Arsenic (Sodium Arsenate), Atoxyl, Trypanroth, or a combination of Atoxyl and this Aniline dye have given promise. Malachite Green, Chrysoidine, Methylene Blue, have also been suggested as worthy of trial.—*c.f. p.* 259.

Research was instituted by arguing from analogy with the Tsetse-fly disease in cattle. It was found that *Glossina palpalis* can carry the disease for a period of 48 hours from the sick to the healthy.

The glossina must be exterminated, but in addition immunisation experiments have been undertaken, the principle being to pass a strain of trypanosoma through different races of animals until a certain degree of virulence is lost. Laveran has made preliminary attempts by means of horse serum. A similar process has already been carried out by Koch with success in the allied Indian disease in horses—surra.

The blood of 117 people from districts where sleeping sickness is unknown was found by Bruce and Nabarro not to contain a single trypanosome.

In addition to finding the trypanosomes in the blood, a very useful method is to examine the lymphatic glands; the trypanosomes are here very numerous and motile in incipient sleeping sickness. The fluid is easily removed with a hypodermic needle on puncturing.

The glandular enlargements in sleeping sickness are probably caused by the arrest of the trypanosome in the glands, where, indeed, many of them are destroyed, but whence some escape from time to time into the blood, and thus produce the increase which has been observed in the peripheral circulation. The wearing of clothes is the only reason assigned for the fact that Europeans have been thought to be immune.—L. ii./03,542, 553, 788, 990 (staining); 1673 (cultivation); 1727 (Report of Expedition to Senegambia); P. J. ii./03,839.

The condition of the stomach in sleeping sickness is a marked feature. It is comparable with the petechial hæmorrhages met with under the endo- and epicardium of the heart in other trypanosomic affections. Summary of results in 1905. The action of arsenic on the trypanosome *in vitâ* is partial.—L. ii./05,1902.

Royal Commission Report on Trypanosomiasis.—L. ii./05,780.

The trypanosome was found in the spinal fluid of 70% of

cases (34) of sleeping sickness—in all in which the spinal fluid was examined. Sleeping sickness presents three stages. Koch's immunising experiments with success.—Castellani, B.M.J. ii./04,71.

Prevention of trypanosomiasis.—B.M.J. ii./04, 1456.

Discussion on trypanosomiasis.—B.M.J. ii./04,367 (Bruce); 1454,1455; B.M.J. i./05,570; Reports on—B.M.J. ii./05,582 (Bruce's address to B.A.), L. i/06,227. Koch's remarks.—B.M.J. ii./04,1445. Trypanosomes in Soudan.—B.M.J. ii./04,1454.

Laveran—a paper on prophylactic inoculations against trypanosomiasis, malaria, and pirœplasmosis.—L. i./06,1198.

Trypanosomiasis and kala-azar (=black fever).—L.i./06,1198.

Tuberculosis.

The sheep and horse are resistant to tuberculosis. Their blood plasma may prove a suitable remedy.—Paton.

The deaths from tuberculosis amount to 60,000 in England and Wales alone in a single year.

Only 4% of married persons take consumption one from the other.—B.M.J.E. ii./05,9.

Tuberculin, Old. Tuberculinum Kochii, P.G.iv.

That of P. Belg. is similar.

This is an amber-coloured liquid—an old glycerin broth culture of the tubercle bacillus, boiled and concentrated, from which the bacilli have been removed by filtering.

It was introduced by Koch in Germany, as an injection for the cure of diseases depending on the growth of the tubercle bacillus.

It is supplied in bottles containing 1 Cc.

The use of Tuberculin for the treatment of human tuberculosis has much diminished. The chief purpose to which it is now put is as a diagnostic of tuberculosis in cattle, for its injection into healthy animals produces no reaction, while in tubercular beasts there is a constant rise of 1½° to 6° F. after injection. The Lister Institute prepares tuberculin suitable for human and animal use. The diagnostic dose of the Lister Institute product for animals is 16 minims.

Dose.— One-thousandth of a cubic centimetre, increased if desired to one-tenth or more.

As a diluent phenol solution of a strength of 0·5% is usually employed, but a stronger phenol solution may also be used. No larger quantities of the solution should be prepared than are required for a few days' use. As soon as the solution becomes turbid it is unfit for further use.

It contains Peptone Salts, extractive substances and an active principle derived from the tubercle bacilli.—P. Belg.

Sterile Dilutions are supplied (freshly prepared)

ready for use, and may be conveniently arranged so as to have a dose in 1 Cc., or in 20 minims as desired, according to the graduation of the syringe employed.

Koch denies that bovine is identical with human tuberculosis, and believes that cow's milk and meat cannot give rise to human tuberculosis.—B.M.J. ii./01,190; L. ii./01,187; L. ii./03,333. V. Behring demonstrated a very close relationship between them.—B.M.J. i./03,806. Koch's work and theory disproved: the organism is the same in both—Römer, Marburg.—L. i./05,658.

The bacilli in man and cattle may be different varieties of the same species. Discussion.—L. ii./03,333,352,399, 473,560,744,788. Human tuberculosis is more generally the result of man to man infection.—L. ii./03,850.

Effects of Injection.

The most obvious effects produced on injection are a rapid rise of temperature, which seems to depend upon the existence of tuberculous disease for its intensity; a period of depression with chill and rigors is followed by high temperature and inflammatory fever, and subsequent defervescence. The tuberculin seems to act upon the tuberculous lesions, and even partly to destroy them—it is not definitely destructive to the tubercle bacilli—or their surroundings, and subsequently there is a risk of further symptoms from blood poisoning dependent on this. In many instances the tuberculin has appeared to cause a very serious fall in the blood pressure, leading even to a fatal issue; in others the mischief has seemed to be due to a coagulating influence on the blood corpuscles, tending to blood stasis, congestion and hæmorrhage, especially in unhealthy areas adjacent to tubercular deposits; and again tuberculin does at times show an irritant effect on the white blood-corpuscles (leucocytes), causing inflammatory swellings. In cases where these evil results have been avoided there has been observed in a considerable proportion of suitable cases, a marked improvement resulting from a series of injections of tuberculin. The most favourable results have been noticed in cases of commencing phthisis pulmonalis, and in skin affections especially in lupus of the face, but where phthisis has been far advanced evil results have been very frequent.

A valuable diagnostic, specially for cattle, the violence of symptoms limiting its applicability in human subjects. If temperature of an animal rises rapidly to 104° F.

during the first 24 hours after an injection it is certainly tuberculous.—L.i./93,448; ii./01,208; B.M.J.E.i./04,21.

Some employ a combined treatment with the old and new tuberculin, commencing with 0·0001 Gm. of the old with the object of ultimately giving as much 1·0 Gm. of the same.—Hewlett.

Used as a diagnostic of tuberculosis in man.—B.M.J. i./96,690; L. i./00,1703.

Tuberculin O.

Consists of the 'obere' or upper layer of solution of bacilli cultivated on glycerin serum which are desiccated and treated with water. Tuberculin R. is the solution of the residuum. This latter is Tuberculin "New" introduced in 1897. It is, in reality, a solution or emulsion of the bacilli in distilled water and centrifugalised: it is not boiled:—

Tuberculin R or TR, Koch's New Tuberculin. (A tuberculin may be in Codex 1907.)

This is now principally employed. It is an opalescent liquid containing 10 milligrammes of solid substance in each Cc. It may be diluted with a 20 per cent. solution of glycerin. The dose is $\frac{1}{1000}$ milligramme of solid substance to begin with, increased up to 20 milligrammes. Injections are generally made every second day (but *c.f.* Wright under Opsonins).

This is used for treatment only, and not for diagnosis.

Sterile Dilutions are prepared for use containing the amount of solid substance desired by the physician in a convenient quantity, *e.g.*, in 1 Cc. or in 20 minims for injection.

Lupus treated with excellent results.—B.M.J. ii./97,207; L. i./98,168; B.M.J. ii./98,80.

Living tubercle bacilli are found in this new Koch's tuberculin, so caution in its use is necessary.—B.M.J.ii./98,1235.

Good effects in nine cases of tuberculous disease, phthisis, and for lupus.—B.M.J. ii./98,77.

Tuberculosis of knee. Sinus closed under repeated doses of $\frac{1}{600}$ milligramme.—B.M.J. i./06,204.

Good results with Wright's method, *v. infra*.—L. i./06,1070.

Phthisis, recovery of four cases out of thirteen.—L. ii./98,194.

The serum reaction of tubercle in connection with Koch's new tuberculin.—L. i./03,1299.

Some experiments on monkeys with bovine and human tuberculous material; those fed with the bovine material gave no evidence of tuberculous ulcers in the intestine, whilst every animal fed with the human had evidences of intestinal lesions.—L. ii./03, 745.

Tuberculous interstitial keratitis treated by sub-conjunctival injection.—L. ii./03,403.

Bovine tuberculosis when present in man occurs almost exclusively in children under 10 years of age.—B.M.J. i./06,701.

Tuberculosis treated by the toxin of bovine tuberculosis as an immunising agent.—B.M.J.E. ii./04,47.

General effects good, especially in surgical tuberculosis. —L. ii./97,704; i./05,923, ii./05,760.

A plea for greater use of Tuberculin as curative and as prophylactic.—L. ii./04,886.

Review of Koch's old and new tuberculins as curative agents. —B.M.J. i./05,292.

Tubercular cystitis marked improvement under treatment with Tuberculin T.R., commencing with 1/250 mgr., and increasing to 1 mgr. daily.—B.M.J. i./05,1089.

Editorial on recent work.—L. i./05,1143.

German municipal methods of combating tuberculosis.— L. i./05,1155.

Sciallero's Tubercle Extract, a new product, is a fatty substance obtained without heat.—B.M.J.E. i./05,16.

Tuberculins have value as specific means of treatment. **Wright** has demonstrated that it is possible to increase the defensive properties—**opsonic power** of the blood serum against the bacillus. The "old" Tuberculin is still a valuable remedy.—B.M.J. i./05,1392.

Opsonins are substances contained in the serum or plasma of the blood. They possess the power of influencing bacteria in such a way as to render them more easily attacked by phagocytes.—B.M.J.i./05,342.

The Opsonic Index for a given organism, *e.g.*, *B. tuberculosis*, is the ratio of the opsonic power of the serum of a patient as compared with that of the normal being.

Capillary tubes are filled with equal quantities (i.) of washed blood corpuscles; (ii.) suspension of tubercle bacilli; (iii.) serum to be tested. These are then mixed and incubated 20 minutes. The average number of bacilli ingested per corpuscle is then determined; in like manner a determination is made with an equal quantity of a normal serum or of a mixed average serum; the ratio is then indicated. **The Tuberculo-opsonic Index** in particular has been the subject of considerable investigation.

The Normal Tuberculo-opsonic Index has been found to average 0·95.

An index below 0·8 or above 1·2 is suggestive of tuberculosis. The results are somewhat paradoxical.

Wright explains these by dividing infection into two classes—

(1) *Local*—the opsonic power being permanently low and does not vary.

(2) *Systemic*—great fluctuations and frequently above the normal. On injecting a vaccine there is generally first a diminution in protective substances, *i.e.*, a fall in opsonic power. This is the "negative phase." Then follows a rise in opsonic power constituting the "positive" phase. By observation it has been proved that an injection should not be given during the negative phase, as that would increase this phase.

Wright now employs New Tuberculin T.R. in quantities (heated one hour after dilution, at 60° C.) equal to $\frac{1}{1000}$ milligramme of dried powdered bacillary substance and never exceeds $\frac{1}{100}$ milligramme.—B.M.J. i./05,1392; L. ii./05,1406; L. i./06,236.

Particulars as to method see Proc. Roy. Soc., Vol. lxxiv., 1904, and Clin. Jl., 9/11/04; also C.D. i./06, 917 (outline of bacteriological technique).

The dose of Tuberculin is repeated at suitable intervals, and thus a cumulative positive phase is obtained and the resistance is much increased. By observation on different individuals the time required for the positive phase to develop may be ascertained, and the necessity of estimating the Opsonic Index is done away with. As a preventive to recurrence—three injections during one month out of every six are to be given until the patient is considered safe.—L. i./06,1099.

The opsonic power of the blood of the majority of phthisical sufferers is said to be higher than normal. Discussion on this view.—B.M.J. ii./05,1617.

Watson Cheyne discusses Prof. Wright's method of treatment with Tuberculin. Points out many exceptions to the rule of low Opsonic Index in Tuberculosis, not explainable by auto-intoxication.—L. i./06,78.

Edmund Owen criticises Wright's opsonin—treatment a "bacillary relish."—L. i./06,1665.

"The aim of treatment is to raise the opsonic index, and this is done by the subcutaneous injection of sterilised vaccine prepared from 'killed' pure cultures of bacteria in serum. The dosage is governed by the opsonic index. The first effect of the introduction of the vaccine is to produce a negative phase, the opsonic index falls temporarily, and then

the tide rises probably above normal, and thirdly falls again and remains steady somewhere above the point at which it started, say 0·65. It is now time for a second injection, and if the treatment is successful after a series of such tides the opsonic index is permanently raised to such a point that the phagocytes get the better of the invading microbe, and the patient recovers."—C.D., i./06,918.

Tuberculo-Opsonic Index found low after antidiphtheritic inoculation, but this has nothing to do with the specific antitoxin.—Bradshaw, L.i./06,1387.

Behring suggested that children might possibly be immunised against tuberculosis by feeding them on milk from immunised animals, but it has been found impossible to pass the Antitoxin in this way to the child, though it can be absorbed from the mother's milk. —M.A. 1906,55.

The same worker thinks he has discovered a new cure for tuberculosis; the nature is complicated, and the cure is not yet procurable.—B.M.J. ii./05,964; L. ii./05, 1115,1126,1900.

Marmorek introduced a new anti-tuberculous serum and vaccine. He claims to have isolated the true toxin from cultures of the bacillus.—L. ii./03,1642; B.M.J. ii /03,483,754,1434,1621; and to have cured a case of acute miliary tuberculosis by 47 injections of serum. The dose of the preparation is from 5 to 30 Cc. —B.M.J. i./04,749; L. i /04, 979. Five cases treated with good results.— L. ii./05,760. Undoubtedly of value.—B.M.J. i./06,340. Beneficial effect on the temperature and general condition.—B.M.J.E. i./06,60.

Koch's statements on the present position of combat against tuberculosis.—L. i./06,1459.

Typhoid Fever, Anti-Typhoid Inoculation.

For general preventive use **Anti-typhoid Tablets** are suggested, *v.p.* 664.

The fact that in China enteric fever in epidemic form rarely occurs is, according to one authority, due to the fact that the Chinese drink tea (which implies boiling water) instead of water, congee instead of milk, and that uncooked food is seldom taken.

As already indicated, the toxin in the case of *B. typhosus* is an intracellular one ("Endotoxic," Macfadyen); it is not conveyed in a soluble form to a nutrient medium. The dead bacteria are toxic if injected into animals.

The anti-microbic sera give usually disappointing

results. Chantemesse has prepared one of these.—L. i./03,322; B.M.J. ii./04,1449.

Anti-typhoid Vaccine Inoculations have been used as a prophylactic by Wright, Haffkine, Semple and Leishmann. In the experiments of Wright, the vaccine used was a four weeks' old culture of typhoid bacilli, sterilised at a temperature of 60° C., and preserved by 1% of Lysol or Carbolic Acid.

The protective inoculations cause a febrile state, with headache and general aching; in some cases there is sickness and diarrhœa. The inoculated person should remain in bed for at least 36 hours; the blood is found to give Widal's reaction when tested.—L. i./01,403.

The bacilli have been disintegrated by pulverising with liquid air, and have been used to immunise apes, by which means an antitoxic serum is claimed to have been produced—Macfadyen.—B.M.J. i./03,681.

Continuing his work in this direction, Macfadyen has prepared an antitoxic serum through the medium of goats, which are much more suitable than horses for the purpose. The serum of the horse treated with the virus is practicaily devoid of antitoxic value. Small sublethal weekly doses of fresh cell juices were employed for immunising the animals.—B.M.J. i./06,905.

Fifty cases treated with serum, all recovered.—L. i./06,716.

Preventive inoculation is desirable before going to a country where typhoid is present, but it should not be practised upon those present in an epidemic of typhoid fever, because the inoculation produces a temporary enhanced susceptibility.—Hale White.

The **Anti-typhoid Extract of Jez** is prepared by immunising rabbits, killing them and making a glycero-alcohol extract of the brain, spleen, &c.—B.M.J.E. i./01,51; i./02,27. Ten cases treated, 6 to 12 Cc. daily.—B.M.J.E. ii./04,87.

Methods of standardising anti-typhoid vaccine.—L. i./06, 1252.

Promising results of anti-typhoid vaccination at Maidstone.—B. M. J. i./98,908.

Haffkine on inoculations in India.—L. i./99,1698. Discussion.—L. ii./99,41.

Wright's remarks on the introduction of typhoid inoculations into England.—L. ii./99,41,1727.

Protection by inoculation may last for two years.—L. i./00, 1578; also B.M.J. ii./01,394.

Results at Ladysmith, Natal.—L. ii./00,95.

Note on the value of anti-typhoid prophylactic injections.—B.M.J. i./01,84.

Results favourable in Egypt.—B.M.J. i./01, 1072; L. i./01, 1272.

Army results.—L. ii./02,651.

It is stated that watercress may be responsible for typhoid, but that supplied to London is claimed to be bacteriologically pure.—B.M.J. i./05,784.

Experiments on soldiers with anti-typhoid vaccine.—M.A. 1906,56. Wright's comments on official reports on his treatment.—B.M.J. ii./04,1343.

Lincoln epidemic of 1905, no anti-typhoid inoculation was tried.—W.W.W.

Inoculation with success. First dose 2 mgr. of dead phenolised agar culture, increased to 10.—B.M.J. i./05,1166.

Notice of the Report of the German Commission on Anti-typhoid Inoculation is generally favourable.—L. i./05, 1453.

An unsatisfactory case with Antityphoid Vaccine.—L. ii./05, 827.

Antiseptic treatment by Sulphurous Acid, 20 to 30 minims. Antipyretic by Quinine, or Calomel, Turpentine Capsules.—B.M.J. ii./04,1449.

An **Anti-Colon Bacillus Serum**, *c.f.p.*765, has also been made in an experimental manner. Suggested for use in infections in urinary organs, and prior to operation as a prophylactic; sterilised cultures of *B. prodigiosus* protect against this organism.

Vaccination, Vaccine, Glycerinated Calf-Lymph. Vaccinum, P. Belg., as prepared at the Veterinary College at Brussels.

This Lymph has several advantages over that obtained even from healthy children. Vaccinia produced by the injection may be regarded as variola in a modified form. Vaccination at the time of infection with small-pox may probably modify the disease, as the incubation period of vaccinia is 4 days, whereas that of variola is 12 days. Attenuation by passage of the organism through an animal of greater resistance to the disease than man is known as '**Jennerisation**.'—Bosanquet. The danger of imparting infectious and other human diseases is absolutely avoided, and the e is but slight risk of communicating any disease peculiar to the cow. The place of insertion should be small, otherwise the reaction is too great. The amount of protection afforded seems to be

greater than that afforded by humanised lymph. Glycerinated lymph is recognised as the safest lymph for vaccination, and by the VACCINATION ACTS AMENDMENT ACT, 1898, it is enacted that if a child has not been vaccinated when nine months old, the public vaccinator of the district shall visit the home of the child, and shall offer to vaccinate the child with Glycerinated Calf Lymph free of charge.

It is supplied in tubes each containing sufficient for 2, 3 or 8 cases, and also in vials for 30 to 40, and 60 to 80 vaccinations.

Calf Lymph is also supplied by the Lister Institute in **Metal capillary tubes** to be used within one week from date of issue. It is directed to be stored at a temperature below 10° C. (50°F.). To open the tubes cut off both ends of same with a sterile sharp knife-blade or scissors transversely to the flattened surfaces.

Vaccination Lancets of special form are convenient.

Vaccination Pads of Wood Wool and Vaccination Shields are made for protecting the vaccinated part from friction and from infection with dust.

Vaccine Injectors of rubber are prepared of different forms and are *sine quanon* in careful vaccination.

Chloroform water recommended instead of glycerin; said to kill off the extraneous bacteria in 6 hours.—L. i./03,1738; B.M.J. i./03,1225; i./04,1273; B. & C.D. ii./04,275; M.A. 1906,58. Urgent demands for vaccine as in an epidemic could be met by this method with a supply of vaccine in 14 days instead of the month or six weeks requisite for glycerination.

For the storage and use of lymph it is recommended to mix lymph 50 parts, glycerin 25 parts, and water 25 parts.—Pr. lx.284.

Reynolds, of Chicago, states that it only remains potent about 120 days.—L. ii./98,1341.

Report of a Lancet Commission on glycerinated calf lymph.—L. i./02,1621.

Compulsory vaccination. Parliamentary Debate.—B.M.J. i./06,998,1003.

Tetanus after Vaccination, Report of Commission on deaths from.—B.M.J. i./02,285,1102.

Tetanus after Vaccination on a lady's leg, recovery under chloral hydrate.—L. i./02,506.

Discussion on tetanic germs in vaccine lymph.—B.M.J.E. i./02,49.

A treatise, historical, bacteriological, giving the method of manufacture of calf vaccine, the glycerination of the same, the filling into tubes, and the bacteriological examination of lymph.—C.D. ii./01,629.

The parasite of smallpox and vaccinia, an amœboid protozoon, can be stained with Safranin and Lœffler's Blue.—B.M.J.ii./04,1410; L. ii./04,1777.

The King Institute in Madras has a Vaccine Section which yields sufficient vaccine every month to vaccinate 150,000 people.—B.M.J. i./05,807.

This is a gigantic preventive step and a pregnant "set-off" to the Antivaccinators' agitation. They might refer to B.M.J. i./05,769, in which they will read how a vaccinated baby, which was nursed by its mother who was suffering at the time with confluent smallpox, remained in perfect health throughout the entire infection period.

The organisms of variola, vaccinia and varicella.—L. i./05,118.

Whooping-cough often ceases after vaccination with calf lymph.—M.A., 1906,369.

Ox Plasma has been recommended for influenza, to which the ox is resistant.—Paton. This and

Normal Horse Serum, Horse Plasma (Liquid) are supplied in 10 and 25 Cc. vials. *Dose.*—1 to 2 drachms. Is employed to increase the amount of "complement," *v.p.*757.

In typhoid has been recommended by Paton as an ideal food, also in tuberculosis; he remarks that the horse is immune to this latter disease.

Byno Plasma. A mixture of the above with malt extract. A tissue food in restoring from collapse after parturition and for anæmia.

ANIMAL ORGANOTHERAPY.

ANIMAL GLANDS AND TISSUES AND THEIR PREPARATIONS.

Of the animal extracts introduced during the last few years, those of the supra-renal capsule, the thyroid gland, and bone marrow have established a reputation in the field of therapeutics. Many others are prepared, and their use is suggested for various forms of disease.

Ancient Organotherapy reviewed.—Pr. lxvi.420.

Lecture on Organotherapy.—L. i./02,1089.

The prefix 'Opo'—meaning juice—is given by Pochl, of St. Petersburg, to many of these animal extracts.

Animal Membranes in the treatment of granulating wounds.

The employment of Goldbeater's Skin, the peritoneum of the ox (known as *Cargile Membrane* in America) has been followed by that of the gastro-intestinal mesenteric attachments of the sand-shark, *Carcharias littoralis*, one of which produces 2 or 3 square feet of gossamer-texture strong material which can be kept in alcohol. Suggested to employ dog-fish mesentery.—L. ii./04,1738.

Articular Liquid Extract.

Dose.—15 to 30 minims three times a day.

Prepared from the fresh cartilages and synovial membranes of healthy animals. Employed in chronic rheumatoid arthritis, and various diseases of the joints and associated structures.

Red Bone Marrow Extract.

The marrow of ox and veal-bone and sheep's ribs has been used as a remedy for pernicious anæmia, chlorosis, scurvy, purpura, hæmophilia, debility, lymphadenoma and rickets.

Tablets, containing 1 grain of the desiccated marrow, equal to 20 grains of the substance in its natural state. Each weighs 3 grains. *Dose.*—1 to 3.

Marrubin.—*Syn.* Glycerin Extract of Red Bone Marrow, **Medullary Glyceride.**

Dose.—1 to 2 drachms, increased if desired.

A thick brownish liquid, containing the full activity of the ox-bone marrow, and is recommended as a nutrient substitute for cod liver oil. Being flavoured, it is palatable. It has had remarkably beneficial effects on weak children. It is easily assimilated and retained. Particularly suited for the anæmia resulting in tuberculosis, and has been found valuable in malaria. —B.M.J. i./94,1172; L. ii./94,682; M.C. Mar. 1895, 431. It is valuable in treatment of leucocythæmia.

Virol. Is claimed to be a preparation of bone marrow, with malt, egg, and lime. It is agreeable in flavour, and is said to have nutrient properties for infants.

Myelocene. Is an ethereal extract of bone marrow, with a small quantity (1%) of Chloretone; it has been used by inunction, and poured into the ear for deafness due to disease of the middle ear.—P.J. i./02,294.

Prior to application of the Myelocene half a drachm of equal parts of warm alcohol 90% and glycerin may be employed with massage.—B.M.J. i./02,699,999; ii./02,614; L. i./04,84.

Employed also (previously liquefied by warming, after drying the surface skin) in skin affections, eczema and psoriasis, furthermore in rheumatism.

For lupus, the nodules are treated with Myelocene to remove the catarrhal processes, and then a caustic is used and the Myelocene treatment again resumed. **Myelocene Fluid** may be dropped into the ear.

Cerebrin and Myelin. *Syn.* **Brain and Spinal Cord Extracts.**

These may be tried for the relief of locomotor ataxy, chorea, epilepsy, and melancholia, separately or mixed together. Halliburton suggests that Choline is the active principle of brain and nerve substance.—Journ. Phys.1901,229. **Cerebrin Tablets** contain 5 grains.

Cephalopin.

An oily extract of brain material given for epilepsy, chorea and hysteria.—P.J. i./05,725; B.M.J.E. i./04, 72.

It has been injected as an antidote to strychnine poisoning.—B.M.J. ii./04,1646.

Brain Extract.

Dose.—5 to 20 minims *per os*, or hypodermically.

One minim equals three grains of sheep's brains.

Spinal Cord Extract.

Dose.—5 to 20 minims thrice daily by the mouth.

1 minim is equivalent to 1 grain of fresh spinal cord. May also be administered hypodermically.

The last two may also be employed mixed in equal volumes. They are prepared with glycerin and 0·5% Phenol.

Cerebrinum Poehl. *Syn.* OPOCEREBRIN. Is a special preparation made in the laboratory of Professor Poehl in powder and tablet form. Given to quieten epileptics and check the attacks, but sodium bromide is given simultaneously, 30 to 50 grains a day.

Spinal Cord Tablets, $2\frac{1}{2}$ grains (0·165 Gm.). Chorea, recovery under cerebrin.—L. ii./93,819.

Neurasthenia improved by brain extracts.—B.M.J. ii./93,1321 ; ii./00,819.

Locomotor ataxy much improved by cerebrin.—Med. Ann. 1894,409.

Thirteen cases of tubercle and syphilis improved under extract of sheep's brain.—B.M J.E. i./94,20.

Corpora Lutea (Powder).

Dose.—$\frac{3}{4}$ of a grain twice a day.

This preparation is said to have been successful in relieving vomiting, nausea, palpitation of the heart, and other distressing symptoms often associated with pregnancy. Good results may be hoped for in women suffering from disorders of the menopause.—M.A. 1906.

Duodenal Membrane. In view of the fact that an extract of the mucous membrane of the duodenum of the pig has given good results in the treatment of diabetes by stimulating the secretion of the pancreas—with resulting increase in the oxidation process going on in the body—a

Liquid Extract of the Duodenal Membrane has been prepared. Strength, 1 minim=1 grain of the fresh substance. *Dose.*—5 to 20 minims. Tablets representing 5 grains are also manufactured.

An Acid Extract of the Duodenal Cells. *Dose.*—1 ounce three times daily, preferably between meals. Made by dilute Hydrochloric Acid afterwards neutralised;

has given good results in diabetes.—"Bio-Chemical Journal," Vol. 1, No. 1.

Antiglucosine is a preparation of this nature.

Duodenal Membrane Desiccated. Clean the upper portion of the duodenum. Scrape off the mucous membrane and scale on glass by drying between 70 and 80° C. Mix three of this with 1 of Calcium Phosphate and pass through No. 60 sieve. The temperature does not destroy activity of the "Secretin."—P. J. i./06,166; C.D. i./06,255.

Eye.

Several proposals have been made to use extracts made from the tissues of the eye as remedial agents, by Louis Dor in 1897 and by Lagrange in 1898.

A **Retinal Extract** has been more recently tried in cases of atrophy of the retina and tobacco amaurosis.—B.M.J. ii./03,190. Is prepared of strength 1 ounce = 4 retinæ. *Dose.*—2 drachms.

Opticine is a similar preparation; results in retinitis; it is given internally.—B.M.J. ii./03,724.

Mucin.

Dose.—5 to 10 grains (0·32 to 0·65 Gm.).

This is the essential constituent of the secretions of mucous membranes, buccal, nasal, pharyngeal, &c. It is precipitated from these by alcohol and by acetic acid. The saliva produced by the submaxillary and sublingual glands contains it, but not the parotid. It may be procured from areolar or connective tissue, and from bile.

Taken internally, relieves painful digestion, gastritis and gastric ulcer. In the form of a spray containing Mucin 5 grains, Sodium Bicarbonate 5 grains, Menthol 1 grain, Lime Water ½ ounce, Distilled Water ½ ounce, has been found of value in dry catarrhs, rhinitis, &c., pharyngitis, and where incrustations on the laryngeal lining.—L. ii./00,730; ii./01,972; i./02,961; i./03,374.

Ptyalin. *Dose.*—5 to 30 grains. This active constituent of saliva is given to assist conversion of starch in dyspepsia.

Ovaries.

Following the example of Spermin obtained from the testes, some experiments have been made with the ovaries. An extract has failed in the treatment of osteo-

malacia, but has proved of value in the cure of dysmenorrhœa and menorrhagia, and for climacteric ailments. M. 1897, and P.J. ii./96,246; B.M.J. ii./00,821.

Tablets, 5 grains (0·32 Gm.).

The name 'Varium' is given to a trade brand of Ovarian Extract:

Chlorosis treated by juice.—B.M.J.E.ii./96,43,75,92.

Mental disease may be improved.—B.M.J. i./04,130.

Haemophilia treated by Tablets and Adrenalin solution locally.—L. ii./04,1279.

Spermin. *Syn.* ORCHIDIN; TESTICULIN.

The use of an extract from the testicles of animals for treatment of human diseases was suggested by Brown-Séquard. In the male it was asserted that injections of testicular fluid re-animated sexual power and cured impotence, especially when simply the result of senile decay.—B.M.J. ii./00,821.

Spermin is looked upon by Poehl as a **Katalysator**, *i.e.*, a substance having the power of temporarily influencing the metabolic changes going on in the organism. It is pointed out that without some agent of this nature the low temperature of the body would not be sufficient to bring about the various chemical changes in the body.—Batty Shaw.

Oxydase is the name applied to the Katalysator present in the leucocytes. *See also* Adrenalin.

Liquor Testicularis, Orchitic Fluid.

Dose.—15 minims hypodermically, or by mouth to 30 minims.

Prepared from the testes of animals (preferably guinea-pigs), by maceration with glycerin and subsequent filtration under pressure in contact with carbonic acid, by d'Arsonval's process.

For anæmia with irregular menses, several injections may be made between periods, preferably into muscular substance.—Bull. Med. xxviii.3,1903.

Tablets of Didymin (Testicular Substance), 5 grains (0·32 Gm.).

Spermin (Poehl) is sold in 2% solution in capsules containing about 1 Cc. for hypodermic injection.

Spermin Essence (Poehl) for internal use.

Dose.—20 to 30 drops twice daily.

The definite body, Spermin, may be obtained not only

from testicles, but also from the ovaries and pancreas, and especially from the roes of fish at spawning time.

Orchitin is given in doses of 0·5, 0·8, 1·0, or 3·0 Gm. *per os* during 24 hours.

Opo-orchidin in 0·5 to 0·8 Gm. doses thrice daily.

These preparations have been tried for the relief of anæmia, debility, diabetes, impotence, tabes dorsalis, and neurasthenia with varying results.

Spleen.

A special use of the spleen of healthy animals as a food has been tried in cases of lymphadenoma.

It is alleged that Splenic principles are blood-forming and alterative, and their use has been suggested in cases of anæmia, chlorosis, rickets and phthisis.

Improvement has followed the use of spleen and its extracts in cases of Graves' disease, but such extracts sometimes give rise to nausea and indigestion, and, if given hypodermically, may produce local inflammation and abscesses.

Spleen extract aided digestion and nutrition, increased the cutaneous circulation, stimulated glandular action, and improved the mental condition of insane persons. Bullock's spleen was used; an extract was made, of which one drachm represented one drachm of fresh spleen; dose beginning at 1 to 3 drachms, and increased to an ounce.—M.C., March 1898,439; L. i./02,1095.

Stagnin (not at present obtainable), a spleen extract recommended to check menorrhagia.—B.M.J.E. ii./04, 15, 16.

A depressor substance is found in the spleen, liver, testes, pancreas, ovary, and a number of other organs. —L. i./06,1303.

Tablets of Spleen Substance, 5 grains (0·32 Gm.).

Supra-renal Capsules.

Development, structure and functions of the Supra-renal Capsules.—L. i./05,178.

The active principles of these organs have been found during the last few years to be most valuable remedies both by the physician and surgeon.

The fresh gland was first given to relieve Addison's disease, then dried preparations were used, also liquid extracts, and lastly an active principle, Adrenalin, in

the form of its Chloride is now used both internally and externally for many purposes.

These preparations are notable for causing contraction of small blood vessels when applied locally, blanching the skin or mucous membrane, and for a general tonic effect on the arteries when given internally; they strengthen the heart's action, slow and regulate the pulse. Locally there is an astringent action, and capillary bleeding, epistaxis and menorrhagia are checked; useful for bleeding after tooth extraction, and of the greatest value applied to the nostrils for hay fever and coryza. It is applied by the surgeon locally to check bleeding and blanch the parts for operations on the eye, ear, nose, throat and larynx.

Use.—Internally the action resembles digitalis and acts as a cardiac stimulant in mitral regurgitation and in cases with a weak, irregular pulse, and may be given in any form of hæmorrhage; but it is really only efficient when it can reach the actual bleeding surface —hence will stop hæmatemesis, but not hæmoptysis; it may also be given to relieve syncope from chloroform. Its use has been suggested in Graves' disease and Addison's disease.

The maximum effect is produced by intravenous injection of $\frac{1}{120}$ grain (0·0005 Gm.) of the dry extract per $2\frac{1}{5}$ pounds (1 kilogramme) of body weight; $\frac{1}{800}$ grain (0·000075 Gm.) has a distinct action on the heart and arteries of an adult.—B.M.J. ii /02,170.

Tablets, Compressed, of fresh Gland Substance, each equivalent to 5 grains are prepared. In Addison's disease, with considerable benefit—L.ii./05,523

Supra-renal Extract, Dry.

Dose.—$\frac{1}{2}$ to 3 grains, three times a day.

This is prepared of such strength that 1 grain represents 8 grains of fresh sheep's supra-renal gland substance.

Glandulæ Suprarenales Siccæ, U.S.

Average dose.—4 grains.

Supra-renal glands of sheep, freed from fat, cleaned, dried and powdered. Ash limit 7%.

Supra-renal Snuff contains—

Dry Supra-renal Extract 1, Menthol 2, Ammonium Chloride 6, Boric Acid 4, Lycopodium 4, and is for use in hay fever. **Rhinodyne** contains this extract.

Tabellæ, Chocolate, contain $\frac{1}{2}$ grain of dry extract

equivalent to 4 grains of fresh gland, and are agreeable for internal administration.

Nebula Extracti Supra-Renalis, C.L.T.E.

Supra-renal Extract 48 grains, Sodium Sulphate 10 grains, Distilled Water to 1 ounce.

Liquid Extract of Supra-renal Glands.

Dose.—10 to 15 minims (0·6 to 0·9 Cc.).

This is a light brown liquid prepared with glycerin, strength 1 = 1 of the fresh gland. It was with this preparation that all the early valuable results were obtained.

For local application rarely used stronger than 10%.

Suppositories contain 3 minims of Liquid Extract in 15 grains of Gelatin basis; to check bleeding piles.

Suppositories, Supra renal with Morphine.—These contain $\frac{1}{4}$ grain of Morphine Hydrochloride in addition. Useful for painful piles.

Supra-renal Uterine Injection.—1 part in 10 used.

Supra-renal Ointment.—Liquid Extract of Supra-renal Gland 50 minims, Liquid Paraffin 2 drachms, Hydrous Wool Fat to 1 ounce. It may be scented with Otto of Rose.

Spray for the Nose and Throat.—For use in hay fever and coryza, contains 5% of Liquid Extract.

Hypodermic Injection. *Dose.*—1 to 5 minims.

Liquid Extract of the Supra-renal Gland is employed as such or diluted with Normal Saline Solution.

Exophthalmic goitre treated beneficially by Supra-renal Extract.—B.M.J. ii./05,1249.

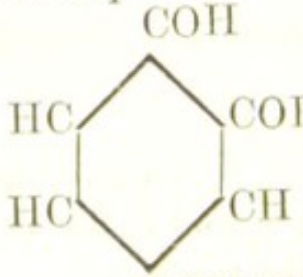
Naso-pharyngeal hæmorrhage stopped.—B.M.J. i./02, 266; Pr. lxx.311; L. ii./04,965.

Prostatic hæmorrhage checked.—B.M.J. i./01,1266.

Acne rosacea well treated by local, in addition to internal use.—B.M.J.E. i./01,55.

Adrenalin. P. Belg. (Tests are given).

This is an active principle of the supra-renal gland of composition



or $C_9H_{13}NO_3$=181·77 (183·144 I. Wts.)

$C.CH(NH.CH_3).CH_2OH.$

(first prepared by Dr. Takamine) in grey crystals,

difficult of solution, hence the chloride in solution is in use. Determined by cryoscopic methods the M.W. was found to be 174·3.—'Chemical News,' Oct. 21,04,207.

Insoluble in alcohol and ether. Not precipitated by ordinary alkaloidal reagents. It is chemically a very powerful reducing agent.

Hemisine, Renaglandin, Suprarenalin, Adnephrin and Renostypticin are similar preparations.

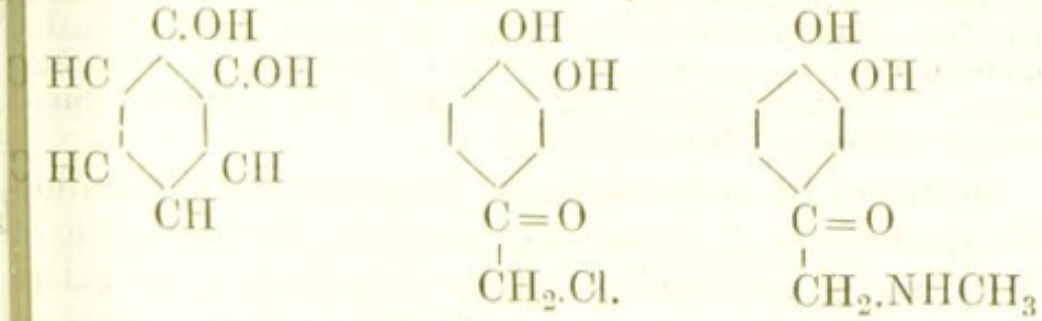
The gland contains other principles which have not yet been examined.

In the preparation of Adrenalin the supra-renal capsules are reduced to pulp and macerated, excluding oxygen as much as possible, in warm (50° to 80° C.) water or very dilute acid for 5 hours, the mixture being then heated at 90° to 95° C. to coagulate albuminoids. This aqueous extractive is evaporated and extracted with alcohol. Precipitation from this liquid of impure Adrenalin follows by means of ammonia. It is purified by ether-alcohol, and re-precipitation with ammonia or fixed alkali.

This substance, according to the classification of Poehl, is a **Katalysator** (*c.f.* Spermin). In this instance the katalysis is in the direction of reduction. Poehl is of opinion that glycosuria following on the use of adrenalin is due to a reducing action.—Batty Shaw (*q.v.* for complete account of phsyiological action of adrenalin).

Adrenalin is probably produced from Trytophane, which is a chromogen substance resulting from decomposition of albumin. It gives a violet colour if a little calcium chloride, or chlorine or bromine water be added to the solution in acetic acid.—L. ii./05,1919.

Synthetically, a body with chemical and physiological properties very similar to those of adrenalin has been made by starting from Pyrocatechin,



inverting this into Chlor-acetyl-pyrocatechin; thence ith Methylamine into the Ketone; finally reducing to

the body of the third formula (*p.* 801) strongly resembling Adrenalin. The Chlor-acetyl compound and the Ketone are physiologically very active, but not nearly so powerful as the ultimate body.—Dakin, Jl. Physiol., Vol. xxxii., P.J.i./05,725,909 ; L.ii./05,341.

Adrenalin Chloride Solution.

Dose.—5 to 30 minims (0·3 to 1·8 Cc.), by the mouth.

This is a solution of 1 of the Adrenalin Chloride in 1,000 of Normal Saline Solution, with 0·5% of Chloretone. This solution may be diluted with Normal Saline Solution 10 times (or less) for use as hypodermic injection. It has also been suggested for intravenous use. It controls the heart's action (like digitalis), and $\frac{1}{200}$ of a grain produces marked effect in cardiac failure. A few drops locally applied render the area blanched and bloodless. It has been injected with Cocaine and Eucaine to produce anæsthesia and restrain bleeding during surgical operations (*vide* Eucaine, Adreucaine and Eudrenine). Both these combinations have been applied to epitheliomatous growths and ulcers.

Braun considers that Adrenalin should be injected in very dilute solution, the maximum dose being 0·5 Mgr., *i.e.*, 0·5 Cc. of the 1 in 1,000 Solution diluted with 50 to 200 Cc. of the Cocaine Solution.

Adrenalin Inhalant. 1 in 1,000 Adrenalin Chloride in aromatised oil ; is soothing and astringent in inflammatory affections.

For use as spray the Adrenalin Chloride Solution in Normal Saline diluted to 1 in 2,500, or even 1 in 5,000 parts, is effective in the nostrils or within the uterus. Schäfer considers it acts more strongly on uterine muscle than any other drug.

Codrenine.

Dose.—For dental use 8½ minims (0·5 Cc.) two or three minutes before extraction. A solution 1 Cc. of which contains Cocaine Hydrochloride 0·02 Gm. ($\frac{1}{3}$ grain) and Adrenalin 0·00006 Gm. ($\frac{1}{1000}$ grain). A local anæsthetic and hæmostatic. For local anæsthesia over large area dilute 1 volume with 9 volumes of Normal Saline.

Tablets of Adrenalin ($\frac{1}{300}$ grain), with Cocaine Hydrochloride ($\frac{1}{6}$ grain) are prepared for dental use. They will fit into cavities where pulp has to be extirpated, or they may be dissolved in 15 to 30 minims of water, forming a solution suitable for ordinary cases.

Eusemin. The name given to Solution of 5 of Adrenalin Choride Solution 1 in 1,000, Cocaine Hydrochloride 0·75 in Normal Saline Solution 100.

Adrenalin in solution is easily oxidisable, and the solution turns pink on exposure to air and light, hence the bottles should be opened as little as possible.—Barker.

'Sterules' of Adrenalin are prepared. In these the activity of the solution persists for months, in all probability for years, owing to their being hermetically sealed.

Glass Capsules are also prepared containing 10 and 15 minims, having elongated ends, which may be snapped off; these are a great convenience, particularly in dental work, to check hæmorrhage after tooth extraction.—B.M.J. i./03,849.

The 15 minim size are for use with the β-Eucaine Powders in **Infiltration Analgesia** (*v.p.* 283).

Styptic Gelatin.

Gelatin 1½ grains, Adrenalin solution 15 minims, Water 45 minims—this quantity for a dose; contains Salicylic Acid 1 grain to ounce to preserve. Suggested for internal hæmorrhage.

Suppositories, Hollow, of Cacao Butter are prepared, containing 10 minims of the solution. As also 1 in 1,000 of the Adrenalin Chloride in the Theobroma mass. For hæmorrhoids.

Unguentum Adrenalin. Adrenalin 1, Lanolin Ointment 5,000, scented with Geranium Oil. Useful in the nostril in acute coryza and inflamed mucous surfaces.

References to Adrenalin.

On the action of Adrenalin.—B.M.J. ii./05, 125.
A hæmostatic and cardiac stimulant.—L. ii./01, 1752.
For intestinal bleeding.—B.M.J. i./02, 654, i./04, 430.
In typhoid, bleeding.—B.M.J.E. i./05, 48; B.M.J.ii./04,1452.
Eye practice, control of congestion and bleeding.—B.M.J. ./02, 707, 1142.
Stops nasal bleeding.—B.M.J. ii./02, 976; Epistaxis cured by packing nostrils with gauze dipped in Adrenalin Solution 1, Saline Solution 2.—B.M.J. i./04, 489.
Controls vesical bleeding.—B.M.J.E. ii./02, 56; i./03, 421.
Coryza aborted by Adrenalin and Cocaine Spray Solution.—B.M.J.E. ii./02, 3.
In many varieties of hæmorrhage and nasal ailments. B.M.J. ./02, 170, 976. For mouth bleeding.—B.M.J., i./04, 1247.
Hay fever cured by spray of 1 in 10,000.—L. ii./01, 488.
In bubonic plague when unaccompanied with lung and

intestinal trouble, Adrenalin Solution in 1 to 3 drop doses every hour reduces temperature and maintains the pulse.—Also in the melæna of typhoid and malarial spleen.—Jl. Trop. Med. 1904,40.

Graves' disease and Addison's disease, effects in.—B.M.J. ii./02,170 ; i./04,131.

Uterine hæmorrhage checked by Adrenalin applied on a tampon.—B.M.J. ii./03,1504.

Purpura well treated by solution in 10 minim doses.—M.A. 1904,605.

Fails for hæmoptysis, but valuable in hæmatemesis.—B.M.J. i./04,603, 1246 ; ii./04,965,1636 ; i./05,68. L. ii./04,1446.

Ophthalmic work, use of Suprarenal preparations. 'Ocular Therapeutics.'—M.P. Aug. 1905.

Tuberculous pleural effusion 4 to 8 Cc. of the 1 in 1,000 solution injected.—B.M.J. ii./04,1003.

Neurotic heart palpitation quieted by doses of 20 minims twice a day.—B.M.J. i./04,1009.

Laryngeal papillomata 1 in 5,000 solution injected daily.—B.M.J. ii./04,1224.

Inflammation of nose and throat. Spray 1 in 1,000 in Hydrocarbon Oil.—L. ii./04,1160. Or as ointment.—P.J. ii./04,967.

Post-partum bleeding checked at once by swabbing uterus with a 1 in 5,000 solution.—B.M.J. i./04,1254.

In gynæcology for operations on prolapsus uteri and for plastic operations on the vagina, and in amputations of the cervix.—Batty Shaw,139.

Intraserous injections of 10 minims in pleuritic effusion. Good results.—B.M.J. i./06,973.

Thalassin. A powerful poison obtained from sea anemones and other marine animals. It is soluble in Alcohol 95% and is said to withstand heat. Injected into dogs $\frac{1}{1000}$ Mgr. per kilo of body weight caused skin irritation, congestion of mouth and eyes, and sneezing. Large doses stop the heart's action. There appears to be another poison in the tentacles of the same animal.—Richet in Pflüger's Archiv., June 17, 1905.

Thymus Gland. Desiccated.

Dose.—3 to 10 grains (0·2 to 0·65 Gm.)

One grain of this powder represents 8 grains of the fresh gland of the calf. It does not appear to cause pyrexia, or any form of constitutional disturbance. Has been given to improve states of defective nutrition in childhood, for anæmia, Graves' disease, hæmophilia, chlorosis, and leucocythæmia.

Tablets, 3 and 5 grains.

Tablets are of value in rickets.—B.M.J.E. i./02,40.

Relieves urticaria and checks bleeding.—L. i./96,153.

In tachycardia, is useful.—L.i./02,1093.

Liquid Extract of Thymus Gland. 1=1.

Dose.—$\frac{1}{2}$ to 2 drachms (1·8 to 7·0 Cc.)

Exophthalmic goitre, some cases benefited by.—B.M.J. ii./05,1249.

Acidum Thyminicum. *Syn*. **Solurol**. Nucleotin-phosphoric acid.

Dose.—5 to 10 grains.

Approximate composition :—$C_{20}H_{35}N_3O_{16}P_2$ (Kossel) = 630·7 (635·4 I. Wts.). Minkowski has $C_{30}H_{46}N_4O_{15}.2P_2O_5$ = 979·26 (986·528 I. Wts.). A product of the metabolism of the nucleins present in foods containing nucleo proteids, *e.g.*, thymus gland, pancreas, spleen, etc. It possesses affinity for, and solvent action on Uric Acid. It is said to prevent deposition of Uric Acid in the tissues and is, therefore, employed in gouty affections; 1 of the acid will dissolve 1·3 of Uric Acid at 100° F.

Thyminic Acid Tablets, 4 grains each, and an Elixir 4 grains in 1 drachm are prepared.—L. ii./05,19; P.J. i./05,94; Am. Jl. Physiology, Vol. 8, No. 5, Feb. 2, 1905; B.M.J. i./06,687.

Thyroid Gland.

This gland, and preparations made from it, have been employed for relieving myxœdema, cretinism, lupus, psoriasis, and chronic eczema. The methods applied have been (1) by feeding with the glands; (2) by grafting; (3) by the exhibition of the official **Thyroid Solution** by the mouth or hypodermically; (4) by **Dry Thyroid**, in powders, cachets, or tablets. Success has been most notable in cases of myxœdema and goitre; obese and insane persons and weak-minded children have also improved under its use.

For a full account of the treatment of these diseases with thyroid preparations we would refer readers to Batty Shaw, pp. 47–101.

The opinion is held by some that the secretion from the thyroid gland has an antitoxic action, neutralising the toxins produced by bacteria. The action on administration of thyroid gland preparations is in any case (1) a stimulating one—metabolism is increased by a process of katalysis (*c.f.* Spermin) and (2) the production, by means of the parathyroid tissue present when sheep's gland is used, of a substance which has the effect of neutralising the toxic results of this metabolism.

It should be noted that the Thyroid preparations on the market (mostly made from sheep's thyroids) consist really of an extract both of thyroid as well as parathroid tissue

deficiencies, therefore, in both these glands in man are met by feeding with these preparations. During administration of Thyroid preparations signs of thyroidism must be carefully watched for.

In exophthalmic goitre Thyroid Extract is totally unsuited—it aggravates the condition, *c.f.* Potassium Iodide.—B.M.J. ii./05,1249.

Over-doses of Thyroid preparations may cause rapid pulse, feverishness, headache, pruritus, and even delirium. Chronic thyroid poisoning has also been observed—the symptoms being emaciation, muscular weakness, loss of hair, dilated pupil, and general debility.

Bromine, Iodine (first found by Baumann in 1896), and Arsenic have been found in sheep's thyroid glands. Thomson, however, does not agree with Gautier as to the normal existence of Arsenic in thyroid, liver, spleen, etc.—L. ii./04,1229.

The administration of Thyroid Extract causes (in common with extracts of other glands) a fall of blood pressure without altering the strength of the heart and the number of beats per minute. Exophthalmic goitre is frequently associated with enlargement of the thymus gland and the enlargement of this gland accompanies myasthenia gravis.—Batty Shaw.

Thyroid Extract as vaso-dilator in combination with mercurials in pregnancy with mitral disease.—B.M.J. ii./04,922.

Liquor Thyroidei, THYROID SOLUTION (*Off.*).

Dose.—5 to 15 minims (0·3 to 0·9 Cc.), freshly prepared. 100 minims represent one entire gland.

This preparation does not keep well; it does not contain enough glycerin. It is better to add glycerin 15 to 20 of the sliced and bruised tissue, macerate 24 hours, press, and make up to the required volume with glycerin and water *partes æquales*.—P.J. ii./02,140. Mixtures containing Liquor Thyroidei should be prescribed with chloroform water.

Thyroideum Siccum, DRY THYROID (*Off.*).

Dose.—3 to 10 grains (0·2 to 0·65 Gm.), in cachets.

Fifteen grains daily are enough; too large doses have been given.—W.

Prepared from healthy fresh glands of sheep; the surrounding fat, etc., is first removed; the glands are finely powdered after drying at not exceeding 40°C.

and finally the substance is freed from fat by Ether percolation. The following are similar :—

Glandulæ Thyroideæ Siccæ, U.S. *Average dose.*—4 grains (**0·25 Gm.**). Ash limit 6%.

Tablets, 1½ and 5 grains (**0·1 and 0·32 Gm.**).

Thyroidea, P. Belg., contains 0·03% Iodine.

Iodothyrine. *Syn.* THYRO-IODIN.

Prepared by extraction of pancreatised gland by means of petroleum ether, solution in soda, and precipitation by sulphuric acid (0·3 Gm. of fresh sheep's thyroid contain 0·1 Mgr. of iodine), adjusted in strength to contain 0·03% of iodine. Obtained direct from the sheep thyro-iodin contains 10% iodine and 0·56% phosphorus. For method of manufacture, *see* Batty Shaw. Other substances obtained from the gland are thyro-antitoxin and thyroproteid, thyrocolloid, and thyroglobulin. Thyro-iodin and thyroglobulin both contain iodine and arsenic (Batty Shaw). Considering the fact that the iodine content varies very greatly at different times and amongst different animals of the same species, it is very doubtful whether the therapeutic value of the gland is inherent in the presence of this halogen.

Iodothyrine Tablets, 5 grains (**0·32 Gm.**) each, about equivalent to 5 grains of the fresh gland.

These tablets are used for goitre, obesity, myxœdema, psoriasis, eczema, menorrhagia, and for rickets.

These tablets in France are designated **Comprimés Vicario.**

Unguentum Thyro-iodin.

Thyro-iodin 1, Ether 6, Lanolin 48.

Thyroglandin. A dry thyroid extract prepared for the treatment of obesity and myxœdema.

Dose.—3 to 5 grains (**0·2 to 0·32 Gm.**).

Pills 1 grain and tablets 2 grains are prepared.

Method of extraction.—P.J. ii./98,166; B.M.J. ii./98, 79; Jour. Phys. xx. 474.

References to Thyroid Treatment.

It is worthy of note that arsenic and iodine were used in the treatment of myxœdema long before these two elements were found in the thyroid gland.

Victor Horsley's notes on grafting the thyroid gland.—B.M.J. i.90,287; ii./90,201.

Numberless reports of the relief of myxœdema and cretinism have been recorded. Opinion varies as to its value in obesity.

Summary of results of use in the insane, satisfactory.—L. ii./94,846. Twelve cases out of 22 recovered and were discharged.—M.P. 1905,131.

Has been used successfully in psoriasis, in pityriasis rubra, ichthyosis, and alopecia.

Cases of lupus improved.—B.M.J. i./96,725,813,945; B.M.J. ii./96,1200; L. ii./98,1202.

Acromegaly improved.—B.M.J.E. i./96,51; L. ii./96,614.

Tends to assist the development of backward children.—B.M.J. i./98,618.

Carcinomatous nodules succeeding cancer of breast removed by operation, disappeared under 15 grains of thyroid extract daily.—L. i./98,1460; Pr. lxvi,485.

Résumé of effects of thyroid preparations used in 130 cases of mental disease.—B.M.J. ii./00,815.

Apathy may follow use of thyroid.—B.M.J. ii./00,582.

Hæmophilia controlled by the liquor.—B.M.J. ii./00,1375.

In auto-intoxication of pregnancy and impending eclampsia. Full doses.—L. i./03,307.

In the delayed union of fractured bones beneficial consolidation occurred. Thyroidectomy in the rabbit delays the healing of fractured bones.—Batty Shaw.

Osteomalacia, rickets, rheumatoid arthritis, infantilism, acromegaly and gigantism, results in. Also in arrhythmia and tachycardia.—Batty Shaw, 88, 100.

In arterio-sclerosis thyroid preparations are exceedingly useful.—B.M.J. i./06, 121.

Eclampsia, vomiting, and coma in pregnancy must be combated by some substance which will overcome the vasoconstriction of the renal and other vessels; thyroid preparations do this effectually.—Batty Shaw, 91.

Para-thyroid Preparations. Some experimental work has been done with administration of para-thyroid compounds. Exophthalmic goitre is said to have been improved under dosage of 10 to 12 glands daily. Opinions, however, differ as to their efficacy.

Tetany treated successfully by Thyroid. It has been shown that on removing the parathyroids from dogs, tetanus results.—B.M.J. i./06, 262. And an animal thus operated upon may be prevented from tetany by grafting parathyroids.

Anti-Thyroid Serum. *Syn.* ANTITHYROIDIN MŒBIUS. *Dose.*—8 to 75 minims (0·5 to 5 Cc.) in wine, syrup or milk.

The symptoms of Graves' disease and goitre are, by some physicians, supposed to be due to excessive production of thyroid secretion; hence to neutralise this it was thought well to introduce into the body a preparation of the serum of animals who have suffered thyroidectomy, supposing such serum to contain in excess the harmful principles which should be neutralised by the thyroid secretion. Batty Shaw states however that the experimental evidence necessary to justify these conclusions is not convincing. The milk of thyroidectomised animals has also been given with good results.

The serum of rams, from which the thyroid glands

have been removed six weeks prior to bleeding, is preserved by adding 0·5% phenol. It is said to keep indefinitely and to reduce the size of goitre rapidly.

In Graves' disease, improvement.—B.M.J.E. ii/02, 71; i./04,35; L. i/03,78; ii./03,78; ii./03, 910. Good results.—M.A. 1906,54.

Basedow's disease may be cured; large doses must be given carefully as a condition suggesting myxœdema may result.—Münch. Med. Woch, 1905, No. 29.

Thyroidectine. *Dose.*—5 grains in capsules from the dried blood of thyroidectomised animals has been given in exophthalmic goitre.—L. ii./05,1383.

Myhème or Myxhème. *Dose.*—1 drachm thrice daily. Consists of the blood of sheep, previously thyroidectomised, mixed with equal volume of glycerin. Said to have been of value in myxœdema.

Experiments with thyrolytic sera obtained by injecting animals with extracts of cells from the organs of a different species of animal have not given very specific results.—Batty Shaw, 80,83.

Rodagen.

Dose.—5 to 10 grammes daily. A white powder and tablets consisting of the dried milk of thyroidectomised goats with 50% Milk Sugar to improve the keeping qualities. In exophthalmic goitre (Basedow's or Graves' disease), this preparation causes a reduction of the swelling, diminution of pulse rate and increase of body weight. In exceedingly chronic cases the treatment must be prolonged over an extended period. Effects on the tremor, palpitation, insomnia, etc., are noticeable after two or three weeks use, *i.e.*, after taking 100–200 Gm. of Rodagen.—B.M.J. ii./05,1251. See also Batty Shaw, p. 77. Six cases of exophthalmic goitre in females greatly improved.— B.M.J. i./06,326.

Other Organic Principles.

The following preparations of animal glands and tissues are also obtainable but have not come into general use by physicians: Cardin (Heart Extract), Mammary Substance, Parotid Gland, Pituitary Body, and Prostate Gland Substance.

Glandulen, from the bronchial glands of sheep in 4 grain tablets; failed to benefit cases of phthisis.

Chorionin, representing the placenta of the sheep, employed as a lactagogue.—L. ii./03,1179; Placental Opotheraphy.—B.M.J.E. ii./04,3.

Hirudin. The principle in leeches obtained from

Hirudines. (*Sanguisuga Medicinalis, S. officinalis and H. quinquestriata*—the latter I.C. Add.)

Coagulates the blood. Apparently a peptone allied to albumose. Easily soluble in water. Insoluble in alcohol. —P.J. ii./04,584.

Anticoagulente is a leech essence employed in France.

GAUBIUS' TABLE

Of Proportion of Dose according to Age.

For an adult, suppose the dose to be					1	or	60	grains
Under 1 year will require				,,	$\frac{1}{12}$	,,	5	,,
,,	2	,,	,,	,,	$\frac{1}{8}$	,,	8	,,
,,	3	,,	,,	,,	$\frac{1}{6}$	,,	10	,,
,,	4	,,	,,	,,	$\frac{1}{4}$	,,	15	,,
,,	7	,,	,,	,,	$\frac{1}{3}$	,,	20	,,
,,	14	,,	,,	,,	$\frac{1}{2}$	,,	30	,,
,,	20	,,	,,	,,	$\frac{2}{3}$	,,	40	,,
21 to 60, the full dose, or					1	,,	60	,,

Above this age, an inverse gradation must be observed.

Another rule is, for children under 12, add 12 to the age, and divide the age by the amount thus obtained; thus for 8 years $\frac{8}{8+12} = \frac{2}{5}$ of adult dose

MINERAL WATERS.

The following information regarding mineral waters has been obtained by applying in most instances direct at the sources.

The arrangement of the paragraphs is as follows:—

The name of the water and locality is given, then follow in order the names of spring or springs, the nature of the water, the chief chemical constituents, the medicinal uses, the season, if any, at the health resort, and an indication as to whether the water is imported in the bottled condition. The accounts of some are, however, condensed.

Adelheidsquelle (Bavaria).—Saline Tonic. Sodium Chloride and Carbonate, Carbonic Acid. Skin affections, rheumatism, gout, women's diseases. May to September. Imported.

Aesculap (Hungary).—Aperient. Magnesium and Sodium Sulphates, Sodium Chloride and Calcium Sulphate. Occasional and habitual constipation, bowel and liver disorders. Imported.

Aix-la-Chapelle (Aachen, Prussia). — Saline, Sulphurous. Both drunk and for baths. Sodium Chloride, Sodium Bicarbonate, Sodium and Potassium Sulphates, some Sulphuretted Hydrogen, Carbonic Acid. Rheumatism, gout, stiff joints, skin diseases, syphilis. 15th May to 30th September, also winter season 15th September to 31st March, and imported.

Aix-les-Bains (Savoy).—Anti-rheumatic. Sulphur and a curious organic matter called Baregine, which renders it easy of digestion, oily and suitable for massage. Rheumatism, gout and throat diseases. 1st April to end of October.

Alet (Aude, France)—Source des Bains and Source Nouvelle. — Alkaline carbonated. Calcium and Magnesium Bicarbonates, small quantity of iron, Carbonic Acid. Pregnancy, debility, dyspepsia, intestinal disorders, anæmia. June 1st to September 30th, and imported.

Alexanderbad (Bavaria).—Chalybeate. Iron and Manganese. Anæmia, chlorosis, incipient phthisis, various diseases of women, nervous diseases. May 15 to beginning of October.

Alexisbad (Germany). 3 springs: Alexisbrunnen, Schönheitsquelle, Stahlbrunnen or Grotte. — Chalybeate, Iron, Manganese, Potassium Chloride, Free Carbonic Acid. Anæmia, diabetes, nervous diseases and women's diseases. May 20th to September 20th.

Allevard (Isère, France).—Sulphurous carbonated. Calcium and Magnesium Bicarbonates, Sodium Chloride, Calcium, Sodium and Magnesium Sulphates, free Sulphuretted

Hydrogen, Carbonic Acid and Nitrogen. Chest affections of all kinds, skin diseases, women's diseases, rheumatic complaints, June 1st to September 30th, and imported.

Apenta (near BUDAPESTH). — Aperient. Magnesium, Sodium and Calcium Sulphates, Sodium Chloride with small quantities of Lithium and Potassium Sulphates. Habitual constipation, hepatic torpor, congestion, hæmorrhoids, gall stones, gout, uric acid diathesis. Imported.

Apollinaris (NEUENAHR, GERMANY).—Acidulated alkaline, stable water. Sodium Chloride, Calcium and Magnesium Bicarbonates, with large excess of Carbonic Acid. Catarrhal affections of the respiratory organs and mucous membrane, acute and chronic laryngitis, bronchitis, dyspepsia, gout and gravel. Imported.

Arabella (HUNGARY).—Saline aperient. Magnesium, Sodium Sulphates, similar to Apenta. Obesity, gout, rheumatism, liver and kidney disorders. A mild purge. L.ii./03,322. Imported.

Arnstadt (GERMANY).—Saline, Sodium Chloride. Scrofula and skin affections. April to September.

Baden-Baden (GERMANY). — Arsenical, Lithiated. Anæmia, chlorosis, gout, dyspepsia, paralysis. Summer and imported.

Baden (near VIENNA).—Sulphurous. Calcium and Sodium Sulphates; rises warm and contains free Carbonic Acid. Rheumatism, gout, diseases of bones and joints, metallic poisoning, scrofula and syphilis. Throughout the year.

Bagnères-de-Luchon (HAUTE GARONNE) and **Bagnères de-Bigorre** (HAUTES PYRÉNÉES, FRANCE) Labassère.—Sulphurous, warm. Sodium Sulphydrate. Skin affections, chronic bronchitis, lung, skin and rheumatic affections. Imported.

Barèges (HAUTES-PYRÉNÉES, FRANCE) — Sulphurous, warm. Sodium Sulphydrate and Sulphate, Sodium Chloride-Silica. Chronic rheumatism, skin and bone diseases. Imported.

Barium (LLANGAMMARCH WELLS, WALES).—Saline. A tumbler full three or four times daily. Sodium, Calcium, Magnesium and Barium Chlorides. Good organically. Only 0·0056 grs. per gallon of Albuminoid Ammonia. Contains no sulphates owing to presence of Barium. Heart affections, glandular swellings, skin affections, rheumatism. Bottled, both aerated and still.

Bath (see SULIS, which is Bath water, aerated and bottled).

Bellthal (MOSEL SPRUDEL bei COBERN a.d. MOSEL, GERMANY).—Table water. Carbonic Acid, Sodium Chloride; free from organic impurity. Summer.

Ben Rhydding. See **Ilkley.**

Berka (WEIMAR).—Chalybeate and Sulphurous, separate springs. In anæmia and rheumatism. 'Moor' and sand baths. May to October.

Bethesda (WISCONSIN, U.S.A.). — Alkaline, Calcium and Magnesium Bicarbonates. Kidney diseases, Bright's disease, diabetes, torpid liver, dyspepsia, insomnia. Imported.

Bilin (Bohemia).—Alkaline acidulated table water. Sodium Carbonate, Sodium Chloride, Sodium Sulphate, Lithium Carbonate, Free Carbonic Acid. Catarrh of the stomach and of the respiratory organs, rheumatism and for Bright's disease. Summer and imported. Pastilles are also prepared.

Birmenstorf (Switzerland).—Saline aperient. Magnesium Sulphate, Sodium Sulphate, with smaller proportions of Calcium Sulphate and Magnesium Chloride. Habitual constipation, jaundice, hæmorrhoids, urie acid troubles. Imported.

Birresborn (Vulkan, Eifel, Germany).—Alkaline and slightly chalybeate table water. Sodium, Magnesium, and Calcium Bicarbonates, Sodium Chloride, Carbonic Acid. Dietetic. Imported.

Bocklet (near Kissingen, Germany).—Chalybeate saline, Chlorides and Sulphates, Ferrous Carbonate. Anæmia and nervous disorders, women's diseases. Imported.

Bonifacius (at Salzschlirf, Hesse-Nassau).—Four wells. Saline Lithiated. Sodium, Magnesium, and Lithium Chlorides, Carbonic Acid, Calcium Sulphate and Bicarbonate. Rheumatism, gout, gall stones, stimulates intestines and urinary organs. 1st May to 1st October, and imported.

Bonnes (see Eaux Bonnes).

Bourboule, La (Puy de Dôme, France) Choussy-Perrière Spring.—Arsenated, 1 litre = 0·028 gm. Crystallised Sodium Arsenate (1·9 grs. per gallon), Sodium Chloride and Bicarbonate. *Dose*, a large tumblerful. Debility, anæmia, chest affections, arthritis. For diabetes.—B.M.J.E. i./06,60. Imported.

Brides-les-Bains (France).—Alkaline saline. Obesity, uric acid diathesis, constipation. Imported.

Bruckenau (Germany).—Ferruginous. For women's diseases, anæmia. Imported.

Brucourt (Calvados, France). "Star" Spring.—Chalybeate. Ferrous Bicarbonate, Magnesium Sulphate, Calcium Bicarbonate. Tonic in anæmia and chlorosis. Imported.

Buda-Pesth, St. Lucasbad (Hungary). (See also **Kristaly**.)—Warm Sulphurous. Potassium, Sodium and Calcium Sulphates, Sulphuretted Hydrogen. For bathing, sulphur mud baths, in chronic rheumatism, sciatica, gout, skin affections. Internally, the hot sulphurous springs for intestinal diseases, constipation, hæmorrhoids. Frequented all the year round.

Buffalo Lithia (Mecklenburg Co., Va., U.S.A.).—Three springs, No. 2 the chief. Alkaline Lithated table water. Calcium Bicarbonate and Sulphate, Carbonic Acid and Sulphuretted Hydrogen. Albuminuria, uric acid diathesis, and other affections necessitating alkaline treatment. June 15th to October 1st, and imported.

Bussang (Vosges, France).—Ferruginous tonic and digestive. Free Carbonic Acid, Sodium, Calcium, Magnesium Bicarbonates with Manganese, Iron, and Arsenic. Anæmia, chlorosis, jaundice, gout, rheumatism, diseases of women. 15th June to 15th September, and imported.

Buxton (Derbyshire).—Slightly Saline. Sodium Chloride, Magnesium Carbonate, Calcium Carbonate, Free Nitrogen and Carbonic Acid. Stomach, bladder, liver, and kidney disorders, skin affections, gout, rheumatism, sciatica. All the year round and bottled.

Cachat (see Evian, Source Cachat).

Cambrunnen (Taunus, Germany).—Alkaline. Dyspepsia, rheumatic affections, skin d seases. Imported.

Capvern (Hautes Pyrénées, France). — 2 springs: Houn-Caoude (drinking) and Bouridé (baths). Alkaline. Sulphates and Bicarbonates of Calcium, Magnesium, and Sodium, Carbonic Acid. Catarrh of bladder, gravel, gall stones, women's diseases. May to October, and imported.

Carabana (Spain).—Purgative. Sodium Sulphate. Intestinal and hepatic affections and dyspepsia. Imported.

Carlsbad (Bohemia).—A number of springs practically all the same; that known as Sprudel is the most important. Alkaline, Lithiated. Sodium Bicarbonate, Sulphate and Chloride, Lithium and Calcium Bicarbonates and Carbonic Acid. Obesity, constipation, stomach, intestinal, liver, kidney, and bladder disorders, gout, and diabetes. All the year round (principally in July). Imported. Carlsbad Sprudel Salts (dry and crystals) are also supplied.

Cauterets (Pyrénées). — Sulphurous. Sulphuretted Hydrogen, Iodine. Skin and lung diseases, glandular swellings. Summer, and imported.

Challes (Savoy).—Sulphurous. Sodium Sulphydrate, free Sulphuretted Hydrogen. Chronic catarrh, skin affections and intestinal diseases. May 15 to October 15, and imported.

Charlottenbrunnen (Silesia).—Chalybeate. Ferrou and Sodium Carbonates.

Châteldon (Puy de Dôme, France).—Alkaline Acidulated. Calcium, Sodium, Magnesium, and Ferrous Bicarbonates, free Carbonic Acid. Stomach and urinary disorders, anæmia, and as a table water. No season. Imported.

Châtel-Guyon (Auvergne, France). Source Gubler.—Alkaline. Calcium, Sodium, Potassium and Lithium Bicarbonates, Magnesium and Sodium Chlorides, free Carbonic Acid. Dyspepsia, jaundice, anæmia, constipation, uric acid diathesis. May 15th to October 15th, and imported.

Claudia (Sorgente di Anguillara, Sabazia near Rome).—Alkaline. Carbonic Acid with small quantities of Alkaline Bicarbonates. Gastric dyspepsia. Imported.

Condal (Rubinat, Lérida, Spain).—Aperient, Sodium Magnesium, Calcium and Potassium Sulphates, Sodium Chloride. As a purgative for habitual constipation, plethora, &c. Imported.

Condillac (France).—Alkaline acidulated table water. Imported.

Contrexéville (Vosges, France). Pavillon Spring.—Alkaline, Anti-rheumatic. Calcium and Magnesium Bicarbonates, Iron and Lithium Salts, free Carbonic Acid. Gravel, gout, gouty diabetes, dyspepsia, eczema, catarrh of the

bladder and liver. 20th of May to 20th of September, and imported. Contrexéville Source Mignon is also supplied.

Dax (called locally La Néhe). Thermal—has temperature 61°C. Owing to evolution of Nitrogen, appears to be boiling. Contains Sulphates and Chlorides of Calcium and Sodium. The mud contains a large proportion of living algæ—the Oscillaria calida. Is distinctly radio-active. In rheumatism. —B. & C.D. i./06,67.

Desaignes (Eau de César) (ARDÊCHE, FRANCE).—Alkaline, Acidulated. Sodium, Potassium, Calcium and Magnesium Bicarbonates, free Carbonic Acid. Table water. Imported.

Dolecoed. See **Llanwrtvd.**

D'Orezza (CORSICA). Chalybeate table water. Calcium Bicarbonate, Ferrous Bicarbonate, Carbonic Acid. Anæmia, chlorosis, dyspepsia; useful after prolonged illness, or for weakness. 1st July to 1st September. Imported.

Driburg (WESTPHALIA).—Chalybeate, Tonic, Aperient. Sodium Sulphate, Magnesium Sulphate, Bicarbonate of Calcium, and Magnesium, some Iron and Manganese, Carbonic Acid. Stone in the kidney and kidney diseases generally, neurasthenia, nervous diseases, women's diseases, anæmia. May 1st to October 10th, and imported.

Droitwich. See **Wychia.**

Eaux Bonnes (BASSES-PYRÉNÉES, FRANCE).—Mild Sulphurous. Sodium Sulphate and Chloride, Calcium Sulphate, Sulphuretted Hydrogen. Helium is given off by the water—due in all probability to radium—containing mineral at the source. Similar to Barèges and Cauterets. Bronchial catarrh, phthisis, neurasthenia, asthma. Principal season, 1st June to 1st October, and imported.

Eilsen (SCHAUMBURG-LIPPE, GERMANY) — Sulphurous. Calcium Sulphate, Sulphuretted Hydrogen, Carbonic Acid. Asthmatic affections, neurasthenia, cardiac asthma, bronchial affections, chlorosis. 15th May to 31st August.

Elizabeth Iron Water (ZAANDAM, HOLLAND).—Chalybeate. Sodium Chloride, Ferrous Bicarbonate. Anæmia, indigestion, nervousness, melancholia, headache. Imported.

Ems, Bad- (GERMANY).—Several springs: Kranchen, Kessel-brunnen, Kaiser-brunnen, Victoria, Fuersten-brunnen. Alkaline Saline; rises warm. Sodium, Calcium and Magnesium Bicarbonates, Sodium Chloride, free Carbonic Acid. Indigestion, asthma, emphysema, gout, useful in coughs with expectoration, and pulmonary catarrh. May 1st to September 30th, and imported.

Enghien-les-Bains (near PARIS). — Sulphurous. Sulphuretted Hydrogen, Magnesium Sulphydrate, Carbonic Acid. Lung affections, skin diseases, uterine disorders, nervous diseases, nose and ear affections. May 1 to Oct. 15. Imported.

Esvach.—Aperient. Magnesium, Sodium and Potassium Sulphates and Bicarbonates, free Carbonic Acid. Habitual constipation, indigestion, biliousness, gout. Bottled.

Evian-les-Bains (HAUTE SAVOY) Sources "Cachat" and La Croix. — Alkaline table water. Calcium and Magnesium Bicarbonates, free Carbonic Acid. Liver and

intestinal disorders; used in large quantities for washing out the bladder in uric acid troubles; calculi, cystitis. May 15th to October 15th.

Fachingen (NASSAU, GERMANY).—Alkaline Acidulated. Bicarbonates of Alkalies and Alkaline earth metals. Said to be bacteriologically pure, and to be useful in infectious diseases, *e.g.*, typhoid, cholera, also for use in the tropics in malaria, and for intestinal diseases, gastric catarrh, heartburn, uric acid diathesis, rheumatism, diabetes, nephritis. Imported.

Fango Mud Springs (ITALY).—Installation at Matlock. For the treatment of rheumatism.

Fiuggi (ITALY).—Saline. Sodium Chloride, Potassium Nitrate, Calcium Carbonate, Carbonic Acid, Oxygen, Nitrogen. Gastric complaints. Imported.

Flitwick (near AMPTHILL, BEDFORDSHIRE).—Ferruginous, Ferric Persulphate and Sodium Sulphate. Anæmia, chlorosis, dyspepsia, general debility and neuralgia. Bottled.

Fontalis.—A pure table water, aerated. Alkaline. Chlorides and Carbonates, free from Lime and Magnesium Salts. Bottled at Harrogate.

Forges (NORMANDY).—Chalybeate. Ferrous Bicarbonate, Chlorosis, dyspepsia. June 1st to October 1st. Imported.

Franzensbad (BOHEMIA).—Aperient, Alkaline, Ferruginous. Sodium Sulphate, Sodium Carbonate, Ferrous Carbonate, free Carbonic Acid. Intestinal catarrh, enlargement of the liver and spleen, Bright's disease, gout, scrofula, anæmia, general debility, diabetes. Also mud baths. May 1st to September 30th. Imported.

Franz Joseph (BUDA-PESTH, HUNGARY).—Aperient. Magnesium and Sodium Sulphates, Carbonic Acid. Habitual constipation, diseases of the liver, for piles, biliousness, headache, catarrh of the stomach and intestines. Imported.

Friedrichshall (SAXE-MEININGEN, GERMANY).—Aperient Magnesium and Sodium Sulphates, Sodium Chloride, Magnesium Chloride. Constipation, intestinal complaints, biliary disorders, gallstones, gravel, gout, scrofula; an active diuretic and for hæmorrhoids. Imported.

Gastein, Bad- (AUSTRIA).—Very slight mineral contents. Suitable for weak digestion, nervous disorders, paralysis, uterine affections. Imported.

Geilnau (GERMANY).—Alkaline table water. Imported.

Gerolstein (PRUSSIA).—Alkaline table water. Sodium, Calcium and Magnesium Bicarbonates, practically free from organic matter, Carbonic Acid, Antacid. Diuretic. Imported.

Giesshübler (bei KARLSBAD, BOHEMIA.)—Alkaline acidulated table water. Sodium, Potassium, Magnesium and Lithium Bicarbonates, free Carbonic Acid. Intestinal catarrhs, dyspepsia, heartburn, hæmorrhoids and gout. Imported only.

Godesberger (GERMANY).—Table water. Alkaline Saline, Chalybeate. Imported.

Grassion (FRANCE). Bituminous. Throat and chest affections, gastric and vesical catarrh. Imported.

Griesbach (GERMANY). Tonic ferruginous table water, Iron Carbonate, Sodium Sulphate, Calcium Bicarbonate. Imported.

Guber (SREBRENICA, BOSNIA).—Chalybeate. Ferrous Sulphate, Aluminium Sulphate, Potassium and Sodium Sulphates, Arsenious Acid. Anæmia, chlorosis, fevers, skin diseases, nervous affections. Imported.

Halle (BAVARIA) Saline Bromo-iodised. Goitre, scrofulous swellings. Imported.

Harrogate (YORKSHIRE).—Sulphurous. Sodium Sulphurate, Sodium, Magnesium and Calcium Chlorides, Calcium Carbonate, Magnesium Bromide, Sulphuretted Hydrogen, Skin affections, gout, rheumatism, anæmia, dyspepsia. Aperient and diuretic. Summer and winter, and bottled. The Sulphur and Alkaline Carbonates compose half the solid ingredients. The Beckwith Spring contains large proportion of Magnesia. Helium has been traced in the gases rising, hence presence of Radium is assumed.—P.J.ii./05,903.

Hathorn (see SARATOGA).

Homburg von der Höhe (GERMANY). Elizabeth-brunnen, Kaiser-brunnen and Stahl-brunnen. Saline chalybeate, acidulated. Sodium and Magnesium Chloride, Ferrous, Calcium and Magnesium Bicarbonates, Carbonic Acid. Chronic catarrhs of stomach and bowels, habitual constipation, gout, scrofula, chlorosis, inaction of the liver, diabetes and general tonic. May 1st to October 1st, and imported.

Hunyadi János (BUDA-PESTH). — Aperient. Large percentage of Magnesium and Sodium Sulphates, Sodium Chloride, and Sodium and Calcium Bicarbonates. Constipation and biliousness. Imported only.

Igmandi (KOMÁROM, HUNGARY) Water. Radio-active. Saline aperient. Magnesium Sulphate 29·3, Sodium Sulphate 9·5, Calcium Sulphate 0·7, Sodium Chloride 0·8%. Total solids 40·8 per 1,000 Gm. Radio-activity inherent in the Calcium Sulphate.—L. ii./05,777. Corpulency, constipation, hæmorrhoids, rheumatism, gout.

Iodbad Lippik. See **Lippik.**

Ilkley and Ben Rhydding (ILKLEY in WHARFDALE). Chalybeate and Antacid. (i.) Chalybeate Spring. Ferrous Carbonate, Calcium Sulphate, and Alkaline Chloride. (ii.) "Hygeia" Spring. Calcium, Sodium and Magnesium Carbonates, Sodium Sulphate. (iii.) "Ilkley Wells" Carbonated. Free Carbonic Acid, Calcium Carbonate, Sodium Sulphate. Gout and rheumatism. *See also* **Health Resorts.**

Johannis (HESSE-NASSAU). — Saline acidulated tonic table water. Calcium, Magnesium and Sodium Bicarbonates, and Sodium Chloride. Imported.

Kaiser Brunnen (AIX-LA-CHAPELLE).—Table water. Sodium Chloride, Bicarbonates. Gout, rheumatism and dyspepsia.

Kissingen (BAVARIA, GERMANY), RAKOCZY and PANLUR.—Saline, Chalybeate. Sodium and Potassium Chlorides, Iron

and Calcium Bicarbonates. Anæmia, general debility, mental exhaustion, heart, liver, and kidney diseases, gout, obesity, and congestions. Imported.

Kissingen (Bavaria) Bitter Water.—Aperient, Magnesium and Sodium Sulphates, Carbonic Acid.

Koenigsdorf (Oberschlesien, Germany). — Alkaline Iodised. Sodium Chloride, Calcium Chloride, Magnesium Iodide and Magnesium Bromide. Restorative, improves blood condition, strengthens nervous system, for women's diseases and for glandular swellings and skin affections. May 15th to the end of September.

Krankenheil (Bavaria).—Sulphurous, Iodised. Sodium Chloride, Iodide and Bromide, Sulphuretted Hydrogen. Goitre and similar swellings, skin affections. Imported.

Kreuznach (Prussia).—Iodised Saline. Sodium, Calcium, and Magnesium Chlorides, with small quantities of Bromides, Iodides. A tonic water, and has been employed in syphilis, tabes, tubercular affections of lungs, obesity, anæmia, skin diseases, nervous disorders, goitre, and similar swellings. All the year round. Imported. Kreuznach mother lye contains 3,100 grains of Salts in 20 ounces.—P.J. ii./04,136.

Kristaly (at St. Lucasbad, Buda-Pesth).—Table water. Magnesium and Calcium Bicarbonates, Carbonic Acid. In intestinal disorders. Imported.

Krondorf (bei Carlsbad). — Alkaline, table water. Sodium, Calcium, and Magnesium Bicarbonates, Carbonic Acid. Chronic catarrh of respiratory tract, affections of pharynx, larynx, and bronchial tubes, also jaundice, gout, and allied disorders. Imported.

Kronenquelle (Obersalzbrunn, Silesia). — Alkaline Saline Lithiated. Sodium Sulphate Potassium Sulphate, Bicarbonates of Sodium, Magnesium, Calcium, and Lithium. Uric acid diathesis. Imported.

Kronthal (Nassau). — Saline, table water. Sodium, Chloride, Calcium Carbonate. Blue Label.—Plain table water and for dyspepsia. Red Label.—Pick-me-up, rheumatism, gout. Green Label.—Anæmia and tonic.

Labassère (Hautes Pyrénées.) See Bagnères de Bigorre.

Landeck, Bad Landeck (Prussian Silesia). — Sulphurous. Sulphuretted Hydrogen, Sodium Sulphate, Sodium Sulphide. Nervous diseases, gout, rheumatism, and skin affections. Moorbaths. All the year round, more particularly summer.

Langenbrücken (Baden).—Alkaline, saline. Sulphurous. Sulphuretted Hydrogen, Magnesium Bicarbonate and Sulphate, Carbonic Acid. Chronic skin diseases, syphilis, rheumatism, gout, bronchial catarrh. May 20th to October 1st.

Leamington.—Saline. Sodium, Magnesium and Calcium Sulphates, Sodium, Calcium and Magnesium Chloride. Ferrous Carbonate. Dyspepsia, gout, women's disease, sciatica, glandular swellings and skin diseases. Bottled.

Levico (Austrian Tyrol).—Two springs (strong and mild); Arsenical chalybeate. Strong: Arsenious Acid.

0·09 parts per 10,000—1-12th of a grain per pint; the MILD is 1-10th of this. Further constituents: Ferrous Sulphate, and Ferric Persulphate. Anæmia, skin eruptions, neuralgia and amenorrhœa. 1st April to the end of October (Vetriolo has season June 1st to the end of September), and imported.

Lippik (SLAVONIA, HUNGARY).—Iodised water and acidulated. Potassium and Sodium Sulphates, Sodium Chloride, Sodium Iodide, Sodium Bicarbonate. Stomach diseases, scrofulosis, rheumatism, gout, glandular swellings. May 1st to September 30th.

Lippspringe (WESTPHALIA).—Alkaline, acidulated. Small quantities of Sodium Chloride, Calcium Sulphate, Magnesium Sulphate, Ferrous Carbonate with Carbonic Acid and Nitrogen. Chronic lung inflammations, asthmatic affections, bronchial catarrh, intestinal and bone diseases. 15th May to 15th September. Imported.

Llandrindod (WALES).—"Strong Sulphur," "Roman Spring," "Magnesium Spring." The first is radio-active. In skin affections, dyspepsia, glandular enlargements, gout, rheumatism. All the year round.

Llangammarch.—See **Barium.**

Llanwrtyd, Dolecoed Spa (WALES).—Sulphuretted Hydrogen, the strongest in Great Britain.

Loueche (Leuk or **Loeche les Bains)** (VALAIS, SWITZERLAND).—Warm, almost exclusively for baths. Calcium Sulphate, Magnesium Sulphate, similar to that of Bath in England. Rheumatism, gout, women's diseases, skin affections. 1st May to 15th October.

Luhatschowitz (AUSTRIA.)—Saline Bromo-iodised Sodium Chloride, Sodium Bicarbonate, with small quantities of Bromides and Iodides. Catarrhal affections, gouty exudations. Imported.

Magnaris.—A table water prepared at Llandrindod.

Malvern (WORCESTERSHIRE).—Practically free from saline matter, and contains no organic matter. Bladder and kidney diseases and skin affections. Bottled.

Malvern Selzer.—Slightly saline table water.

Marcols (ARDÈCHE, FRANCE), Source du Lion.—Alkaline table water. Sodium Bicarbonate, free Carbonic Acid. Gastric disorders, liver and kidney diseases, rheumatism. No season. Imported.

Marienbad (BOHEMIA).—Several springs, Kreuz-brunnen and Ferdinand brunnen principal, Alkaline, Saline, Chalybeate, Acidulated. Sodium Sulphate, Chloride, Bicarbonates of Alkaline earth metals, Ferrous Iron, free Carbonic Acid. Gout, gravel, hæmorrhoids. Also supplied in powder and crystals. Brain and nervous diseases, melancholia and chronic gastric catarrh, dyspepsia, gall stones, obesity. Summer, and imported. Tablets are also made.

Mergentheim (WURTEMBURG), Karlsquelle.—Aperient Water. Magnesium and Sodium Sulphates, Sodium Chloride,

free Carbonic Acid. Gout, neuralgia, gall stones, dyspepsia, obesity, rheumatism, diabetes. 1st May to 1st October.

Metternich (BOHEMIA).—Alkaline table water.

Miers (LOT, FRANCE).—Saline, laxative. Sodium Sulphate, Calcium Sulphate, Magnesium Chloride. Dyspepsia, calculi, migraine, obesity, albuminuria. Imported.

Missisquoi (VERMONT, U.S.A.).—Sulphurous. Scrofula and other skin affections, diseases of respiratory organs. Imported.

Mondorf (LUXEMBOURG). — Saline. Sodium Chloride, Calcium Chloride, Bicarbonates, with small quantity of Magnesium Bromide. Constipation, neurasthenia, anæmia, skin affections, jaundice, rheumatism. May 15th to October 15th. Imported.

Mont Dore (PUY DE DÔME, FRANCE).—Alkaline, Saline. Bicarbonates, Ferrous Carbonate, Arsenic, and Silica. Intestinal disorders, rheumatism, asthma, bronchitis and laryngitis. June 1st to September 20th. Imported.

Nauheim (GERMANY).—Sodium, Calcium and Lithium Chlorides. Skin and rheumatic affections, heart diseases.

Nenndorf (WESTPHALIA).—With mud baths. Sulphurous, Calcium Sulphurate, Magnesium Sulphate, Carbonic Acid, Sulphuretted Hydrogen. Claimed to be the strongest sulphurous water in Europe. Arthritis, rheumatism, neuralgia, skin diseases, bronchial affections, hemorrhoids, neurosis, etc. May 1st to September 30th.

Neuenahr (PRUSSIA).—Acidulated, alkaline table water. Bicarbonates of Sodium, Calcium, Magnesium, Sodium Chloride, free Carbonic Acid. Laryngitis, bronchial catarrh, asthma, tuberculosis, liver diseases. diabetes, heart disease, diuretic. Summer, commencing May 1st. Imported as Apollinaris.

Nieder Selters.—See **Selters, Nieder-.**

Orezza.—See **D'Orezza.**

Oberbrunnen (SILESIA).—Alkaline Lithiated. Sodium and Lithium Bicarbonates, Sodium Sulphate, Magnesium and Lithium Bicarbonates, free Carbonic Acid. Gout, uric acid diathesis, nephritis. Imported.

Perrier (VERGÈSE near NISMES FRANCE).—Table water, slightly mineralised, organically pure. *Small* proportion of Alkaline Carbonates. Digestive. M.P. June 22/04.

Plombières (VOSGES, FRANCE).—Mild Saline. Sodium Sulphate, Arsenic, Oxygen, Nitrogen. Neurasthenia, gastralgia, dyspepsia, dilation of the stomach and chronic diarrhœa, rheumatism, skin affections. May to September. Imported.

Pougues (FRANCE). St. Leger Spring. — Alkaline. Calcium, Magnesium, Sodium and Potassium Bicarbonates, Sodium and Calcium Sulphates. Dyspepsia, anæmia, scrofula, gravel, catarrh of the bladder. May 15th to September 30th. Imported.

Pullna (BOHEMIA).—Aperient. Magnesium, Sodium and Potassium Sulphates, Sodium Chloride, Chronic Constipa-

tion, liver and intestinal affections, gallstones, gout and rheumatism, eczema. Imported.

Pyrmont (WALDECK, WESTPHALIA). Three springs. HAUPTQUELLE contains most iron.—Chalybeate. Calcium and Magnesium Sulphates, Ferrous Bicarbonate, Calcium Bicarbonate, Carbonic Acid. Chronic catarrh, digestive and urinary diseases, women's diseases, scrofula, rheumatism and gout. May 1st to October 10th (and imported).

Quicherat (FRANCE.)—Ferruginous. Magnesium and Sodium Chlorides, with some Iron and Manganese, Carbonic Acid. Anæmia, stomach diseases. Imported.

Ragatz-Pfafers.—Canton St. Gall, Switzerland. Thermal Spring 99° Fahrenheit. Calcium, Magnesium, and Sodium Chlorides, Bicarbonates, and Sulphates. Very free from bacteria. Rheumatism, gout, sciatica, neuralgia. May to October.

Recoaro (VENETIA, LOMBARDY). Sources: Lelia, Lorgnia and Giuliana.—Ferruginous Table Waters. Sulphates. Intestinal and liver complaints. Tonic, easily assimilated. Summer and imported. ROYAL BITTER SOURCE.—Is pure bacteriologically. Purgative for intestinal complaints.

Reichenhall (BAVARIAN ALPS). Saline. Considerable proportion of Sodium Chloride. Employed principally as bath in scrofula and given for bronchial catarrh. May to September.

Rennine (REIPERTSWEILER, ALSACE).—Nitrated. Potassium Nitrate 0·19 Gm. per litre, Alkaline Chlorides. Diuretic, mild, laxative, in heart disease. L.ii/03,107.

Renaison (FRANCE).—Alkaline, acidulated table water. Bicarbonates, free Carbonic Acid. Dyspepsia and gastric disorders. Imported.

Rhens (AM RHEIN, GERMANY).—Alkaline, acidulated table water. Sodium Chloride, Sulphate and Bicarbonate. Imported.

Rippoldsau (BADEN). — Saline, Acidulous, Chalybeate. Calcium Bicarbonate, Manganous and Ferrous Bicarbonates, Sodium Sulphate, free Carbonic Acid. Anæmia, chlorosis, scrofula, skin affections, rheumatism, gout, neuralgia. 15th May to 1st October. Imported.

Roisdorf (PRUSSIA).—Alkaline, saline, acidulated table water. Sodium Chloride, Sodium, Magnesium and Calcium Bicarbonates, Carbonic Acid. Easy of digestion, for catarrhs of stomach and intestines, and of respiratory organs, liver and spleen affections and calculi in the bladder.

Rosbach (near HOMBURG, GERMANY). — Saline, table water. Calcium and Magnesium Bicarbonates, Sodium Chloride, Carbonic Acid. Gouty and acid dyspepsia. Imported.

Royat (PUY-DE-DÔME, FRANCE). Three Springs.—Saline, Arsenated, Lithiated. Sodium, Potassium, Calcium and Magnesium Bicarbonates, Sodium Chloride with a small quantity of Sodium Arsenate and Lithium Chloride. Rheumatism, dyspepsia, nervous diseases, women's diseases, anæmia, skin affections and debility. Summer. Imported.

Rubinat (Pyrénées, Spain). "Llorach" Spring.—Aperient. Rich in Sodium Sulphate and Magnesium Sulphate, and contains Calcium Chloride. Stomachic disorders, dyspepsia, constipation, liver and kidney affections. Imported.

Rubinat (Serre).—Similar to the last mentioned, but stronger than the above in the proportion of Sodium Sulphate to Magnesium Sulphate. Uses similar to the above. Imported.

Saint Boès (Basses-Pyrénées, France).—Bituminous, Iodised, and Arsenated. Arsenic, Iodine. Skin and lung affections, venereal diseases. Imported.

Saint Galmier (Loire, France).—"Badoit" Table water. Sodium, Magnesium, and Calcium Bicarbonates, Magnesium Chloride, Sodium Sulphate, Carbonic Acid. Dyspepsia, intestinal catarrh, constipation, nervous disorders, hyperæmia Imported.

Saint Galmier (France) "Noel."—Alkaline, Acidulated. Bicarbonates as above. Uses as "Badoit" above. Imported.

Saint Gervais (Haute Savoie).—Saline. Sodium and Calcium Sulphates, Sodium Chloride. Skin affections, constipation, rheumatism and nerve diseases. 15th May to 30th September. Imported.

Saint Lucasbad (Buda-Pesth).—Sulphurous. Rheumatism, neuralgia, and skin affections. All the year round. See also Buda-Pesth.

Saint Moritz (Switzerland). "Paracelse" Spring.—Alkaline, Chalybeate, Tonic. Sodium Sulphate, Calcium, Magnesium, Sodium and Ferrous Bicarbonates. Nervous and intestinal disorders, neurasthenia, neuralgia, sick headache, hysteria, Graves' disease, hypochondria, and for convalescence. All the year round. Imported.

Saint Sauveur.—See **Vernet les Bains.**

Salies de Bearn (France).—Saline. Sodium Bromide and Iodide. Skin affections and as a general tonic.

Salins les Bains (Jura, France).—Tonic. Magnesium Chloride Iodides and Bromides. Anæmia, tuberculosis, general debility, women's diseases, obesity, and scrofulous affections. Summer. Imported.

Sallycc.—Artificial. Is stated to contain Colchicine and Salicylic Acid.

Salutaris—Still and aerated table water, pure distilled water. For washing out the system in kidney and liver disorders, also gout and dyspepsia.

Salvator (Hungary).—Alkaline, Lithiated. Lithium, Magnesium and Calcium Bicarbonates, Sodium Borate. Uric acid diathesis, diseases of digestive organs. Imported.

Salzbrunn (Austria).—Alkaline. Sodium and Lithium Bicarbonates, free Carbonic Acid. Chronic intestinal diseases, gall stones, rheumatic affections, emphysema. 1st May to 15th October.

Salzschlirf—See Bonifacius.

Saratica (Austerlitz, Moravia, Hungary).—Purgative. Magnesium and Sodium Sulphate, Sodium Chloride. Gout, rheumatism and obesity. Imported.

Saratoga (U.S.A.). "Congress" and "Hathorn" springs. —Alkaline, Saline. Sodium Chloride and Iodide, Bicarbonates of Calcium and Magnesium, free Carbonic Acid. A mild aperient given in dyspepsia, skin affections, diseases of the stomach, liver, kidney, and blood, constipation. All the year round. Imported.

Sauerbrunnen (Hartz, Germany).—Table water. Very slight mineral constituents—Magnesium Carbonate and Sulphates. Imported.

Schinznach (Switzerland).—Sulphurous. Sulphuretted Hydrogen, Carbonic Acid, Calcium Sulphate, Sodium Chloride. Skin affections (eczema, acne, psoriasis, urticaria) asthma, gout, rheumatism. 1st May to 15th September Imported.

Schlangenbad (Germany).—Very slight Mineral constituents. Considerable quantity of dissolved oxygen and nitrogen. General tonic. Imported.

Schwalbach (Nassau). Weinbrunnen and Stahlbrunnen. —Chalybeate tonic. Iron, Calcium and Magnesium Bicarbonates. Anæmia, and as a tonic. Imported.

Selters, or Seltzer Water (on the Lahn, Nassau), Ober and Nieder.—Alkaline, Acidulated, Table Water. Sodium Chloride, Bicarbonates, Carbonic Acid. Dyspepsia, obesity, gout, rheumatism, bronchial, bladder, kidney, and liver affections. Imported.

Soulac-sur-Mer (Medoc, Gironde, France).—Health resort. Sea air.

Spa (Belgium). — Ferruginous. Ferrous Bicarbonate, free Carbonic Acid. Chlorosis, anæmia, women's diseases, nervous disorders, arthritis, rheumatism, gout. Summer, and imported.

Sulis (Bath Water, aerated). — Aperient table water. Calcium and Sodium Sulphates, Magnesium and Sodium Chloride. Gives off a radio-active emanation.

Tarasp (Switzerland), St. Lucius Spring. — Alkaline, saline. Sodium Bicarbonate, Sodium Chloride, Sodium Sulphate, Bicarbonates of alkaline earth metals and Carbonic Acid. Diuretic, useful in chronic catarrh of the stomach, dyspepsia, gastralgia, habitual constipation, disorders of nutrition and assimilation, obesity. 1st June to 15th Sept. Imported.

Taunus (Frankfurt). Muriate, alkaline table water Digestive.

Teplitz (Bohemia). — Alkaline. Sodium Bicarbonate, Sodium Chloride, Sodium and Potassium Sulphates, free Carbonic Acid. Rheumatic affections, nervous diseases, paralysis. Imported.

Tonalka. An alkaline tonic aperient water. Supplied in syphons and bottles.

Thonon (Lake Léman, France). Alkaline, Carbonated and Benzoated (Balsamic resins are contained). In liver

complaints and urinary diseases, gravel and albuminuria. Imported bottled.

Vals (Ardèche, France). Springs: Madeleine, Précieuse, Désirée, Rigolette, St. Jean.—Alkaline, acidulated. Sodium, Calcium and Magnesium Bicarbonates, Calcium and Sodium Sulphates, Carbonic Acid. (Contents vary with the spring.) Rheumatism, gout, anæmia, skin affections. Imported. Grains de Vals are also supplied.

Vernet-les-Bains (Pyrénées Orientales).—Sulphated. Sodium Sulphate and Thiosulphate. Constipation, skin affections, anæmia. May to October, and imported.

Vichy (Allier, France). Springs: Grande Grille, Hôpital, Célestins, Parc.—Alkaline, acidulated. Gravel, chronic urinary affections, diabetes, female complaints, gout, rheumatism, facilitates digestion. May 15th to September 30th, and imported.—M. P., Aug. 26, 1893.

Villacabras (Spain). — Saline aperient. Sodium Sulphate. Obesity and constipation. Imported.

Vittel (Vosges, France). Spring: Grande Source.—Alkaline. Sodium and Magnesium Bicarbonates, Sodium, Calcium and Magnesium Sulphates, Carbonic Acid. Uric acid diathesis, scrofula, chlorosis, biliary and urinary congestion. In addition are Source Salée, stronger in Magnesium Sulphate; Source Marie and Source des Demoiselles, Chalybeate. The first two are imported.

Weilbach (Nassau).—Alkaline, sulphurous. Sulphuretted Hydrogen, Sodium Chloride, Sodium, Magnesium and Calcium Bicarbonates, free Carbonic acid. (A lithiated spring exists also.) Aperient for obstructions of the abdominal organs, antisyphilitic in lung and skin diseases. The beginning of May to the end of September. Imported.

Wiesbaden (Nassau). Kochbrunnen.—Antacid. Sodium and Potassium Chlorides. Magnesium and Sodium Bicarbonates, free Carbonic Acid. Uric acid diathesis, rheumatic affections, sciatica, bronchitis and laryngitis. Summer. Imported.

Wildbad (Black Forest, Germany).—Alkaline. Warm, 37° Centigrade. Calcium and Sodium Carbonate, Sodium Chloride, free Carbonic Acid. Rheumatism, paralysis, neuralgia, scrofula, rickets, bronchial catarrh, urinary diseases. May to October.

Wildungen (Waldeck, Germany). Three Springs.—Alkaline. Bicarbonates, Sodium Chloride, free Carbonic Acid. Diseases of bladder and urinary organs, anæmia. Summer. Imported.

Wittekind (Halle, Germany). — Sodium Sulphate Obesity, women's diseases, rheumatism, heart and nerve diseases. 1st May to 1st October.

Woodhall (Lincolnshire). — Saline, Bromo-iodised. Bromide, Iodine, Sodium Chloride, Arsenic. Gout, sciatica, rheumatism, skin affections, goitre, women's diseases. From the end of March to the end of October.

Wychia (Droitwich).—Saline. Sodium Chloride 11·93 and Sodium Sulphate 7·89 per litre. Droitwich water is distinctly radio-active. Laxative, habitual constipation and plethora.—L. i./ 6,38.

BRITISH HEALTH RESORTS.

Bath. — Climate mild and equable. Mineral springs, suitable for gout and rheumatism.

Ben Rhydding (*see also* **Ilkley**).—Bracing. Medicinal springs. Suitable for gout, rheumatism, &c.

Blackpool (Lancashire).—Very bracing. During convalescence.

Bournemouth.—Mild and dry. Sand and gravel soil. 100 ft. above sea level; protected from N. and E. winds by pine woods. Suits persons coming home from the tropics, and for respiratory diseases.

Bridge of Allan.—Mild and equable. Saline springs. Suitable for consumption, bronchial affections, gout, rheumatism, &c.

Buxton.—Highest town in the Kingdom. Thermal springs. Suitable for gout, rheumatism and paralysis.

Channel Islands (Jersey, Guernsey, and Alderney).—Climate fine and healthy. Even temperature. Suitable for all pulmonary troubles and neurasthenia.

Cheltenham.—Spring, autumn, and winter resort. Chalybeate and saline waters. Suitable for respiratory diseases.

Clifton.—Climate equable. Alkaline waters. Suitable for respiratory diseases, also diabetes, liver and urinary disorders.

Cromer.—Climate very bracing, often too cold in spring; cool in summer. Suitable for anæmia, scrofula, nervous affections, and convalescence.

Deal.—Very bracing pebble beach, not fit for bathing; suitable for rest cure, nervous and chronic cases.

Droitwich.—Recommended for its Brine Baths, which are efficacious in rheumatic and gouty affections, congestion of liver and spleen and nervous debility. (*See* **Wychia Water.**)

Eastbourne.—Good sea bathing; suited for convalescents from September to January, especially for cases of scrofula and consumption.

Exmouth.—The old town higher and windy; the new town beside the river and sea beach is more protected, mild and humid.

Falmouth.—A warm equable winter climate; a rival to the Riviera, and cool in summer.

Freshwater Bay.—Isle of Wight. Southern aspect for convalescents and consumptives.—B. M. J. i./c6,990.

Harrogate.—Has Sulphur, Chalybeate and other Saline Springs. See Mineral Waters.

Hastings.—Mild, being suitable as winter resort for convalescents. Unsuitable for phthisis with hæmoptysis and chronic nervous diseases.

Ilfracombe.—Bracing for recovery from illness.

Ilkley (*see also* **Ben Rhydding**) —Bracing moorland air; good fishing; golf links; a hilly district.

Leamington Spa.—Equable climate. Saline Springs. Suitable for chronic liver and kidney complaints, dyspepsia and uterine congestion.

Llandudno.—Climate bracing and appetising; rather windy; a good place for summer health resort.

Llandrindod Wells—Bracing climate. Thermal waters. Suitable for liver complaint, rheumatism, skin diseases. (*See also* **Mineral Waters.**) 700 feet above sea level.

Malvern.—Bracing air; equable climate. Brine and Saline Baths. Suitable in gout, rheumatism, scrofula, &c. (*See also* **Mineral Waters.**)

Margate.—Equable cool temperature, dry sub-soil, and a moderate altitude. Suitable for convalescence and lung complaints, and especially for gland enlargements and tuberculous joints; a very bracing climate.

Matlock Bath.—Thermal and Mineral Springs There is here a Fango di Battaglia (hot volcanic mud cure) installation. Suitable for rheumatic and gouty affections.

Penzance.—A mild, equable, warm climate, but not much shelter from winds.

Scarborough.—Exceedingly bracing. Moors in vicinity. Suit nervous hypochondriacal persons and those recovering from illnesses.

Sidmouth (Devon).—Climate particularly favourable in catarrhal, bronchial and cardiac affections. In phthisis.—B.M.J. i./06,990.

Scilly Isles.—Mild and humid climate, temperature varying less than at any other watering place in Britain.

Southport (Lancashire).—Fine sands, bracing climate, suitable for laryngeal and pulmonary diseases.

Strathpeffer Spa.—Strong sulphurous and effervescing chalybeate waters. Suitable for rheumatism, gout, liver and skin diseases.

Torquay (Devon).—A summer pleasure season, hot and very humid, and a warm winter season; has a mild and equable climate, the soil quickly drying. Suitable for all pulmonary complaints.

Tunbridge Wells.—The old town, much sheltered, lies in a warm valley, while houses on the hills around have a bracing climate.

Ventnor and Weymouth.—Winter health resorts. Have reputation for phthisical sufferers.

Weston-super-Mare.—A mild equable climate; the town sheltered by hills on the north and east; fine sands and plenty of ozone; the tide recedes a great distance.

ANALYTICAL MEMORANDA.

—CHEMICAL TESTS AND MICROSCOPIC METHODS FOR THE EXAMINATION OF URINE, BLOOD, &c.

Acetone and Allied Bodies in Urine.

Lieben's Test is generally employed. Distil the sample and make distillate alkaline with potash, add a little iodine solution (not an alcoholic solution). The formation of iodoform, recognised by yellow turbidity and the odour, indicates presence of acetone.

Legal's Test is also useful:—

Fresh concentrated **Sodium Nitroprusside** [$Na_4Fe_2(CN)_{10}(NO)_2 + 4H_2O = 592{\cdot}38$ (596·544 I.Wts.)] **Solution** (soluble 1 in $2\frac{1}{2}$) added to a specimen or its distillate containing Acetone, made slightly alkaline with caustic potash, produces a red colour which changes rapidly to yellow. On adding Acetic Acid a reddish-violet colour is produced, which changes to blue on standing.

Acetone having a specific gravity of 0·8 will obviously decrease the specific gravity of a urine, and may lead to error if its presence be unsuspected in diabetic urine. This is apt to occur in an advanced stage of the disease.

Acetonuria in cases of gastric ulcer.—L. i./03,1230.

May be associated with the administration of chloroform.—L.ii./05,583.

Salicylic Aldehyde. $C_6H_4.OH.COH = 121{\cdot}13$ (122 048 I. Wts.).

A yellowish liquid, Sp. Gr. 1·165—1·17. Miscible with alcohol and ether. As a test for acetone in urine. To 10 Cc. of the specimen add about 1 Gm. Potassium Hydroxide, and without waiting for solution, 10 to 12 drops of Salicyl Aldehyde. Purple ring indicates presence. – M.,1906.

Diacetic Acid, $CH_3.CO.CH_2.COOH = 101{\cdot}28$ (102·048 I. Wts.), **Gerhardt's Test for.** Ferric Chloride gives red colouration. A few drops of Potassium Citrate solution instantly removes the colour,

Reaction with Sodium Nitroprusside as above. The acid is soluble in ether, and may be removed by it after acidifying the specimen with Sulphuric Acid. Dilute Ferric Chloride solution, shaken with this ethereal solution, becomes red.

Occurrence of, in urine in cases of gastric ulcer.

In employing the ferric chloride test care must be taken to distinguish from colour produced by salicylic acid and compounds, *e.g.*, salicin, aspirin, diuretin, salol.

Boil the urine first for five minutes, then apply test. As the diacetic acid is converted by so doing into acetone there is considerable reduction in colour if dependant on diacetic acid, but is unaltered if due to salicylic acid.—B.M.J.ii./04,114.

Hydroxy- or **β-Oxy-Butyric Acid** $CH_3.CHOH.CH_2COOH$ = 103·28 (104·064 I. Wts.), and any increase in the amount of fat (lipæmia—granules stained by Osmic Acid) should be carefully looked for in the urine and blood respectively of diabetics. It may be extracted from the specimen with ether, and gives a reddish-violet colour with Ferric Chloride. Occurs only if Diacetic Acid be also present. The specimen may be fermented to remove sugar, precipitated with lead acetate and ammonia; if the filtrate be lævorotatory β-Oxy-Butyric Acid is probably present.—B.M.J. i./03,1205.

Albumin Tests.

Acetic Acid with heat. Fill a test tube about half full with filtered urine, slightly acidify with dilute acetic acid. Boil the upper portion. Albumin, if present, will precipitate in the form of a cloud which will be insoluble after cooling on further addition of acetic or nitric acids in moderate amount.

Nucleo-proteids also affect this reaction.—L. i./99, 1085. The urine may be saturated with salt before adding the acid. It is claimed that this will prevent their precipitation.

Asaprol precipitates albumin, peptone, &c., from acid solution. On boiling, peptone and albumose redissolve, albumin remains, *v.p.* 489.

Carbolic Acid (saturated solution in absolute alcohol) recommended.—L. i./99 221.

Not so delicate as Salicyl-sulphonic Acid, but the latter (see below) may be too delicate for clinical work. Further, the milkiness produced by the Phenol emulsifying with the water is a drawback.—L. i /99.1393.

Said to be as delicate as Nitric Acid.—L. i./99,1453.

Resembles the older tests of Tidy and Méhu.—L. i./99,1515.

Albumose (Bence Jones's) occurs in myelopathic albumosuria, a disease associated with morbid conditions of the bones. This albumose is detected by (1) coagulating at 58° C. lower than serum albumin, which coagulates at 75° C., (2) precipitates with *hydrochloric acid*, (3) nitric acid, (4) with potassium ferrocyanide and citric acid.

A table of proteids and reactions is given.—L. i./05,207.

Significance of small quantities of albumin.—B M.J. 1./06,126.

Esbach's Picric Acid Solution.

Picric Acid 10 Gm., Citric Acid 20 Gm., dissolve in about 900 Cc. boiling water, cool and add water to 1,000 Cc. This reagent is used for the approximate determination of albumin by an Esbach tube about six inches long, and 0·6 inch in diameter, the graduations of which are purely empirical, the results of experiment, and indicate approximately 0·1 up to 0·7% albumin.

By comparison with a standard dried albumin solution, 1 in 1,000, and by heating to 180° F. and centrifugalising, the process can be terminated in a few minutes.

For exact determinations, albumin should be precipitated by some suitable reagent, itself nitrogen-free, *e.g.* carbolic acid or tannin and the washed precipitate, dried and weighed, or better the nitrogen contained in it should be estimated by a Kjeldahl analysis, the amount of nitrogen found being multiplied by the factor 6·3 to obtain the amount of proteids.

Ferrocyanic Acid Test Pellets.

Potassium Ferrocyanide, $K_4Fe(CN)_6+3H_2O=419·66$ (422·788 I. Wts.) and Acetic or Citric Acid mixed in solution set free Hydroferrocyanic Acid. On the addition of such a solution to urine, it gives, without heat even, a distinct opalescence if a small, and a dense white precipitate if a large, quantity of albumin be present. Pellets are made of citric acid and also of potassium ferrocyanide to be portable. In about a drachm of urine, in a test tube, an acid pellet is first dissolved, next a ferrocyanide pellet is added and allowed to dissolve (without heat); if albumin is present a precipitate will immediately appear. This test does not precipitate peptones.

This reagent may also be applied as a ring test.

'Layer' the urine on to a mixture of 20 or 30 drop of Acetic Acid with 2 or 3 times its volume of saturate Potassium Ferrocyanide Solution. A white ring indi cates presence of albumin. By this manner of proceedin the precipitation of nucleo-proteids is avoided. — L i./99,1085.

Heller's Nitric Acid Test.

Nitric Acid is placed in a test tube and the filtere urine, or diluted filtered urine, carefully 'layered' on t it. A white ring at the juncture of the liquids indicate presence of albumin; confirm by another reliable test Not so delicate as the **heat and Acetic Acid**, bu will show 1 in 12,000 at once. Bilious urines ma produce play of colours characteristic of Gmelin's test Nucleo-proteids may hinder this test, but these ar precipitated by vegetable acids.

Glass Capsules of Nitric Acid contain one minim are convenient and portable.

Meta-Phosphoric Acid, $HPO_3 = 79{\cdot}44$ (80·008 I.Wts.).—A fresh solution of a little of this acid i added to the clear filtered urine. A cloud or precipita tion indicates presence of albumin.

Millon's Reagent.— Nitroso-Nitrate of Mercury. Mercury 10, Nitric Acid (Sp. Gr. 1·185) 25 by weight, Water 25. Dissolve in a flask a lukewarm heat, shaking often, and add to a solution formed by dissolving Mercury 10, in Nitric Acid (Sp. Gr. 1·25 to 1·3) 22 by weight without artificia heat. With albumin or urea this gives a yellow then red colouration on heating.

Picric Acid Solution, Saturated.

This test is applied by 'layering' as in the Nitric Acid test; or is used as Esbach's solution, *v.p.* 829.

The administration of alkaloids may cause urine to give a precipitate with picric acid, but this is redissolved on heating to the boiling point.

Roberts' Albumin Test.—Nitric Acid 1 part, Solution of Magnesium Sulphate (10 in 13) 5 parts. Is found to be very satisfactory. Has the advantage of high density for use in 'layering.'

Salicyl-sulphonic Acid.

$C_6H_3.SO_3H.OH.COOH = 216{\cdot}47$ (218·108 I. Wts.). In colourless crystals, prepared by action of sulphuric

nhydride on salicylic acid. Soluble in water and lcohol. This test requires careful 'layering' of the rine upon a crystal, or a concentrated solution.

Is an extremely precise, reliable, and quick test, giving a dense white precipitate with all proteids.

Albumin, globulin, myosin, etc., coagulate on heating.

Albumoses dissolve on heating, and reappear on cooling.

Peptones are not precipitated, except in solutions saturated with ammonium sulphate.

Strongly recommended. Not affected by phosphates, bile, urates or alkaloids.—L. i./99,1085. Also by the late A. H. Allen.—P.J. ii./04,9.

Trichloracetic Acid. *See p.* 26. A saturated solution is used in the same manner as the last test, or a crystal may be used. May precipitate uric acid and nucleo-proteids.

Bile in Urine.

Nitric Acid produces a bluish-green ring and play of colours. The fuming acid has been recommended, but that of official strength is better.

It was found that with a moderately icteric urine, even when diluted to the extent of 1 in 50, the typical green colouration could be observed, showing the extreme delicacy of the test. Various modifications of **Gmelin's Test** have been suggested—for example, placing a little of the specimen on a porous disc (Dragendorff) and then applying Nitric Acid, or pouring the specimen on to a filter-paper (Rosenbach) and testing the paper thus stained with Nitric Acid—but these methods seem unnecessary.—C.D. i./03,171.

Peptone Test.—Peptone, in powder 30, Salicylic Acid 4, Acetic Acid 30, Distilled Water 3,500.

Dissolve and filter till bright. On adding 20 minims of urine containing bile salts to 60 minims of this solution, an opalescence appears in proportion to the amount of bile constituents; it dissolves completely on adding acetic or citric acid, and diminishes, but does not disappear, on boiling.—*Oliver.*

Sulphanilic Acid.

$C_6H_4.NH_2.SO_3H(1,4) = 171{\cdot}86$ (173·156 I. Wts.).

1% Solution with Sodium Nitrite 1% and HydrochloricAcid as test for bile pigments.—L. i./06,923.

Tincture of Iodine.—A few drops "layered" on

to the specimen and the tube shaken gently, produce a green colour if bile pigment be present.

Hay's reaction for Bile Salts. Sublimed Sulphur sprinkled into *clear* urine containing Bile Salts commences to sink almost immediately—B.M.J. i./02,702.

Chromic Acid Test. A 5% solution added gradually produces a green colour.

Sodium Nitrite with Sulphuric Acid (Vitali's Reaction) gives green colour.

The spectroscope is employed for detecting Urochrome, Urobilin, Hæmatoporphyrin, Uroerythrin.

Cholesterine (*see p.* 82). Chloroformic solution of Cholesterine with Sulphuric Acid gives a red to purple colour. An Alcoholic solution treated similarly gives a red to blue.

Cholesterine crystals in urine, in diabetes with neuritis, in cystitis, in Bright's disease, in pyonephrosis, in epilepsy, in a case of hæmaturia with fibrous casts, in tabes and lipuria, in fatty degeneration of the kidneys.—B.M.J. i./03,1008.

Tyrosin, β-Oxyphenylalanin-α.

$C_6H_4.OH.C_2H_3(NH_2).COOH = 179{\cdot}77$ (181·128 I.Wts.)

Is recognised by its characteristic crystalline appearance being in shining needles, either in bundles or star form.

Leucin, α-Amido-iso-caproic Acid.

$$\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\rangle CH-CH_2-CH(NH_2)-CO.OH = 130{\cdot}16$$

(131·144 I. Wts.)

Is in crystalline spheroidal clumps. An arterial depressor. Is given in arteriosclerosis. — B.M.J. i./06,126.

Blood Corpuscles

may be recognised microscopically; blood **Pigments** microspectroscopically.

Precipitin Test for Blood (Uhlenbuth's).—Precipitins are formed when the serum of one kind of animal is introduced into the body of another species, *e.g.*, the serum of a horse injected into a goat causes the serum of the goat to be capable of forming a precipitate with normal horse serum. This has been suggested as a possible means to distinguish the blood of different animals, but is not specific for human blood.—Bosanquet. *Vide also* B.M.J. ii./05, 1304, 1374.

Blood in Urine.—Heller's test consists in heating the specimen with strong potash or soda. If present, a colour

described as bottle-green is produced, and earthy phosphates coloured brownish-red by blood are precipitated.

Ozonic Ether and Guaiacum Test for,—add a drop or two of *fresh* Tincture of Guaiacum—Guaiacum Resin 1, in Alcohol (90%) *q.s.* to 10*—to a small quantity of the urine and shake, 'layer' Ozonic Ether on to the mixture. A blue colour at once, or on standing, indicates presence of blood—Iodine in the urine also gives this colour (*e.g.*, if patient has been treated with iodides). Further, pus gives it with Guaiacum Tincture alone, the colour disappearing on heating.

Old French Oil of Turpentine may be substituted for ozonic ether.

Colour reactions produced by iron and manganese salts and other substances.—P.J. ii./05,251.

Blood, Estimation of Hæmoglobin.—Sir Wm. R. Gowers' apparatus consists of two tubes, flattened or round, one closed, containing glycerin jelly coloured with picro-carmin—the standard equal to the colour of a dilution of average normal blood one hundred times (20 cmm. in 2 Cc.), and the other, graduated in 100 degrees = 2 Cc., for the dilution of the sample of blood with distilled water. The outfit further includes a pipette, pricker, india-rubber stand, &c.

The lobe of the ear or the finger is pricked and 20 cmm. of blood are drawn up into the pipette, injected into the graduated tube, which should at the time contain a few drops of water to prevent possible coagulation and facilitate mixture. Water is then added sufficient to produce a tint the same as the standard, the two being frequently compared during the process. The degrees of dilution needed indicate the percentage amount of hæmoglobin. For example, 20 cmm. of blood from an anæmic patient giving the standard tint at 30 degrees of dilution would contain only 30% of the normal quantity of hæmoglobin.

Other Hæmoglobinometers are those of Oliver, Fleischl and Haldane.

Hæmoglobin Scale according to Tallquist consists of a tinted scale with strips of blotting paper to be sucked up with the blood for examination. The tint thus produced is compared by direct light with the scale. The scale indicates 10, 20, 30, &c., up to 100. This refers to amount of hæmoglobin—100 being taken as normal.

Blood, Number of Corpuscles.—One cubic millimeter contains normally about 5,000,000 to 6,000,000 red corpuscles in man, and about 4,500,000 in woman. The average number of white corpuscles per cubic millimeter is about 7,000 to 8,000 in adults, and 10,000 in children.

The hæmacytometers chiefly employed are Gowers' modification of Hayem's, and that of Thoma-Zeiss.

In the Gowers Instrument the cell is $\frac{1}{5}$ mm. deep, and each side of a square is $\frac{1}{10}$ mm., hence the volume of the small square is $\frac{1}{2000}$ cmm. This instrument contains, in addition to the cell, a small pipette which, when filled to the mark on its stem, holds exactly ·995 cmm., a capillary tube marked to contain exactly 5 cmm., a glass stirrer, a lancet

* U.S. has 1 in 5 of alcohol 94·9% vol.

needle, &c. The dilution employed is 1 to 200. The number of corpuscles in 10 squares is counted, and this multiplied by 10,000 gives the number in a cubic millimeter. The above dilution and squares are so arranged that normal blood presents 50 corpuscles per square, or 100 in 2 squares; and by counting 10 squares so as to get the average for two, the *percentage* of corpuscles to that of health is evident, and may be compared with the percentage of hæmoglobin as ascertained by Sir Wm. R. Gowers' hæmoglobinometer, *v.p.* 833.

If, for instance, the blood contain 80% of corpuscles and only 40% hæmoglobin, the value of each corpuscle is represented by the fraction $\frac{1}{2}$. Sometimes in pernicious anæmia the corpuscles sink below the amount of hæmoglobin, and there may be 30% of corpuscles and 40% of hæmoglobin, in which case the value of the corpuscle is $\frac{4}{3}$. The corpuscles having settled, and the percentage ascertained, the objective may be raised so that the corpuscles are somewhat out of focus, the **leucocytes** then appear as bright points, in consequence of their greater refraction, and their number may be counted. Sir Wm. R. Gowers prefers this method to that of staining, *v.p.* 835.

The Gowers instrument is now altered to facilitate counting in that each square is divided horizontally, making parallelograms $\frac{1}{10}$ *mm. in length and* $\frac{1}{20}$ *mm. in width. There are, therefore, 2 of such parallelograms to each square. Four of them contain 100 red corpuscles in normal blood.*—L. i./:6,765.

The **Thoma-Zeiss** instrument consists of micrometer slide divided into 16 squares, each square again divided into 16 smaller squares. It has two pipettes, one for diluting the blood 1 to 100 and 1 to 200 for counting the red corpuscles, the other is intended for estimation of the leucocytes, and dilutes the blood 10 or 20 times. The number of red corpuscles seen in 4, 6, or if greater accuracy is required, 16 (larger) squares, *i.e.*, in 64, 96 or 256 smaller squares, is counted. To ascertain the **number of Red Corpuscles** in 1 cmm. of blood, knowing the volume of the cube standing on each small square to be $\frac{1}{4000}$ cmm. *multiply the total number of red corpuscles counted by* 4,000 *times the number of times of dilution of the blood and divide the result by the number of small squares in which red corpuscles have been counted.* It is always desirable to have an assistant to note the numbers observed, and to count the corpuscles touching and overlapping the two adjacent boundary lines on the left upper corners of the squares, but those on or overlapping the other two sides are excluded to compensate.

The normal dilution is 1 to 200; in polyemia 1 to 400; and in excessive anæmia 1 to 100 may be used. 5 or 6 corpuscles per square are a convenient number for counting.

The fluid used for diluting in both the above instruments is **Sir Wm. R. Gowers' Hæmacytometer Solution**.—Sodium Sulphate 104 grains, Acetic Acid 1 drachm, Distilled Water 4 ounces. Filter.

Hayem's Solution is also employed. Sodium Chloride 2, Sodium Sulphate 5, Mercuric Perchloride 0·5, Water 200.

Estimation of Red Corpuscles by means of the **Hæmatocrite** (not satisfactory for the the white). This instrument consists of two graduated capillary tubes in

metal frame for inserting in a centrifuge to be revolved at high speed. The finger is pricked after cleansing with carbolic solution; the first drop of blood is rejected—this is important—and the next exuding is taken up into both tubes by capillarity; it is then centrifugalised for one minute with 10,000 revolutions. The red corpuscles having the higher sp. gr. are separated at the distal extremity of the tube. Normal blood should reach the mark 45 to 50, indicating 4,500,000 to 5,000,000 corpuscles per cubic mm. Taking the 5,000,000 as a standard, if the corpuscles reach the mark 25 this indicates a percentage by volume 50 or 2,500,000 red corpuscles per cubic mm.

The number of Leucocytes may be estimated in a similar manner, but in this case it is desirable to stain them before counting by using Gowers' diluting fluid, with an appreciable addition of Löffler's Methylene Blue, or by **Toison's Solution** (Dissolve Methyl Violet 5B 0·025 Gm. in a mixture of Glycerin 30 Cc and Water 80 Cc. Dissolve separately Sodium Sulphate 8 Gm. with Sodium Chloride 1 Gm. in Water 80 Cc. Mix and filter.) Leucocytes stained violet, red corpuscles greenish. For accuracy count as many squares as possible.

A further formula for the staining fluid is Formalin 1·5, Sodium Chloride 0·5, Sodium Sulphate 2·5, Methyl Violet 0·01, Water 100.

Another method is to use an aqueous $\frac{1}{3}\%$ acetic acid solution as diluent, in this the red corpuscles become invisible while the leucocytes remain visible (Thoma-Zeiss).

The Thoma-Zeiss cell is $\frac{1}{10}$ mm. deep, and each side of a small square is $\frac{1}{20}$ mm., hence the above figure $\frac{1}{4000}$ cmm. as the volume of a small square.

In **Leucocytosis** the number of white corpuscles may be increased from the normal 7,000 or 8,000 up to 12,000, or even to as many as 1,000,000 per cubic mm.—L. i./03,361.

The Red Corpuscles are normally fairly uniform in size and shape, but altered in both of these in disease. The varieties of the red corpuscles are:—The normal corpuscles (erythrocytes), the small red corpuscles (microcytes), the large red corpuscles (macrocytes), the normal sized nucleated cells (normoblasts or erythroblasts), small sized nucleated cells (microblasts), large sized nucleated cells (megaloblasts), extra large nucleated cells (gigantoblasts), those staining irregularly (polychromatophilic), and those altered in shape (pojkilocytes).

The White Corpuscles in health are composed of polymorphonuclear leucocytes 70 to 72%, small lymphocyte 22 to 25%, large mononuclear leucocytes (or large lymphocytes or hyaline cells) 1%, coarsely granular eosinophiles 2 to 4%, transitional 2 to 3%, mast- or basophile cells 0·5%. Myelocytes are present in leukæmia, but not in health.—L. i./03,360.; B.M.J. i./03, 314.

Strong and Seligman's Method. The stain is composed of Sodium Chloride 0·75 Gm., Methyl Violet 0·012 Gm., Formalin Solution 1·5 Cc. Distilled Water 100·0 Cc.

A new method of blood-counting producing permanent preparations which may be used subsequently. Eliminates

ruled counting chamber and error due to variations in the depth of cells.—B.M.J. ii./03,74.

Enumeration of leucocytes after staining by Leishman's stain (*v. infra*).—Leishman, B.M.J. i./06,68[1].

Improved Method of Counting Leucocytes. To stain, a 3% sodium chloride solution deeply coloured with gentian violet is sufficient. It is simpler to count whole microscopic fields of known area rather than squares. Employing the 1 in 20 pipette, count whole microscopic field, not the squares, move the draw-tube of microscope into such position that $7\frac{1}{2}$ squares in diameter (Thoma-Zeiss scale) are in view. The cubic contents of this = $\frac{1}{50}$ Cmm. Make a mark on the draw-tube—to be used for all occasions. Count twenty fields with above dilution, and add two cyphers to the number so obtained.—B.M.J. i./05,410,576,696,914,1132.

Blood Staining. Smear clean coverslips with a small drop of blood to be examined. Fix by heat, or by immersing half an hour in a mixture of equal volumes of alcohol and ether.

Stain by A. (i.) Five per cent. Aqueous Eosin 5 to 10 mins. stains the red corpuscles copper coloured, then

(ii.) Loeffler's Alkaline Methylene Blue for a few seconds.

or B. By the Ehrlich-Biondi-Heidenhain Stain (*v.p.* 840).

Jenner's Stain is also to be strongly recommended. It may be prepared by mixing freshly 100 Cc. 0·5% Solution of Medicinal Methylene Blue with 125 Cc. of a 0·5 Solution of Eosin (water soluble, yellow shade).

Stain for five minutes, washing in *distilled water* until pink tint replaces greenish colour. Dry and mount.

Should be kept in stoppered bottles well closed, and is best recently prepared. The Methylene Blue and Eosin are said to combine, forming a chemical compound. In staining it is important to cover with a watch glass to prevent evaporation of the Methyl Alcohol.—L. i./09,370.

Blood-film spreader.—B.M.J.ii./05,1650.

Polychrome Methylene Blue also as a blood-stain.—B.M.J. i./05,402.

Romanowsky's Stain, Leishman's Modification.—There are various modes of making and supplying this stain. The following as suggested by **Leishman** gives the best results (the fixing and staining is done in one process so that fixing by heat is unnecessary):—

This is a solution in pure Methyl Alcohol of an Eosin-Methylene-Blue-precipitation-compound, 0·15 grammes of the compound being dissolved in 100 Cc. of Methyl Alcohol. The solution thus formed is a clear dark blue liquid, showing a green iridescence by reflected light. The Stain is used by preparing films of blood in the usual way on clean cover glasses, and allowing to dry in the air. The films should be as thin as possible. Three or four drops of the Stain are dropped on to the film and the cover glass is rotated, no attempt being made to check evaporation as in the case of Jenner's Stain. After about half a minute six or eight drops of water are added, and allowed to mix by rotating with the

Stain, and staining is allowed to proceed for five minutes; in certain cases ten minutes may be necessary. The film is now washed with distilled water, and a few drops of the water are allowed to remain on it for one minute. It is finally dried without heating, mounted in Xylol Balsam and examined with an oil immersion lens. The following results are obtained:—

Red Blood Corpuscles are stained pink or greenish.

Polymorphonuclear Leucocytes red. Nuclear network red. Extra-nuclear protoplasm colourless. Fine eosinophile granules red.

Mononuclears or hyaline, or large lymphocytes.—Nuclei red with sharp outline. Extra-nuclear protoplasm blue, occasionally showing red granules.

Transitional.—Identical with large mononuclears, except that nucleus is reniform.

Small Lymphocytes the same as mononuclears, except that nuclei are more deeply stained.

Coarsely Granular Eosinophiles.—Nucleus red but not so deeply stained. Granules pink.

Basophiles. — Granules deep-stained purple black. Nucleus red but usually somewhat masked by granules overlaying it.

Nucleated Red Cells.—Nucleus almost black with sharp outline. Extra-nuclear portion grey.

Myelocytes stain pale red.

Blood Plates deep red with spiky margins, frequently with pale blue peripheral zone.

Bacilli and Micrococci blue.

Malarial Parasites.—Body stains blue and its chromatin deep red.—B.M.J. i./01,635; ii./01,767. *Vide* also Malarial Parasites, *p.* 870.

Leishman's Stain (Wright's Modification).—Add Methylene Blue 1 Gm. to 100 Cc. of 0·5% Sodium Bicarbonate Solution. Sterilise in a flask in a steam steriliser for one hour. Place in a large dish and add, while sterilising, enough 1 in 1,000 Eosin Solution (yellowish, soluble in water) until the mixture changes to purple and shows yellowish scum on the surface. About 500 Cc. of the Eosin Solution will be required. Collect precipitate formed, and dry in an incubator without washing. When thoroughly dry, dissolve 0·3 Gm. of the powder in 100 Cc. pure Methylic Alcohol. Filter this saturated solution and add to the filtrate further 25% of Methyl Alcohol, *i.e.* to 80 Cc. add 20 Cc. This stain is now ready for use.

Method of use.—Pour stain on to film and stain one minute. Add water drop by drop until greenish scum forms on surface (for $\frac{3}{8}$ inch cover glass 6 to 8 drops required), stain with this further two minutes, wash in distilled water, and soak in same 2 minutes or more, until the thinner parts of film appear yellowish pink, dry with filter paper (no heat) and mount in Xylol Balsam.

Normal Erythrocytes appear yellow or pink. In cells deficient in hæmoglobin the colour is from a pale pink with large central clear space to dirty yellow. Polychromatophilic cells bluish. Granular degeneration or basophilic degeneration shows well as small bluish dots in a pink cytoplasm. Normoblasts have a pink cytoplasm and blue nucleus (in some the

cytoplasm is yellowish, purplish, or bluish). Megaloblasts show blue nucleus and yellowish or bluish cytoplasm.—M.A., 1906,139.

Examination of Blood and Urine by determination of the freezing point.

Lately methods of examination have been introduced to show the excretory power of the kidneys. One important method is the determination of the molecular concentration of the specimen, by a process of "Cryoscopy." The excretory action of the kidney causes different degrees of concentration of the fluid flowing into the kidney as compared with the fluid flowing out of it. Molecular concentration influences osmotic pressure, and is independent of the nature of the substance dissolved in the fluids,—it is determined more particularly by the number of molecules dissolved in unit volume; the osmotic pressure of a liquid is proportional to its molecular concentration. We have a very easy way of measuring indirectly the changes in the molecular concentration and, therefore, in the osmotic pressure of a solution by determining the freezing point of the liquid in question. The freezing point of a solution is so much below that of distilled water as its molecular concentration is greater, and *vice versa*. Solutions with the same freezing point have the same molecular concentration and, therefore, the same osmotic pressure.

The apparatus used is the well known Beckmann's Apparatus, consisting of a thermometer, divided into hundredths of a degree, which is situated in a tube, and in the same test tube there is arranged a stirrer made of platinum wire. The tube is then filled with about 20 to 50 Cc. of the solution to be examined, and is inserted in an outer vessel containing the freezing mixture, salt and ice. Gradually the liquid reaches the freezing point—the mercury in the thermometer falls slowly at first, and then quickly, until ice formation starts, and at this instant the mercury rises on account of the warmth which is liberated on the formation of the ice. The mercury remains at this higher point for a short time, and this point is taken as the freezing point.

Two determinations have to be made—firstly, of the liquid under consideration, and secondly, distilled water. The difference between the two measures the molecular concentration or the osmotic pressure of the liquid. For the purposes of comparison it is obviously necessary to determine the molecular concentration of the blood and of the urine. The value for the blood (which is commonly denominated "delta"), both in the case of man and animals, is fairly constant — namely, about 0·56°; on the other hand, the value for the urine is somewhere about 1 to 2°. It is obvious that any disturbance of the function of the kidneys would make itself evident in these figures—the molecular concentration of the blood would increase, and that of the urine would decrease. A heightening of the molecular concentration of the blood above the normal by the storage up of decomposition products is very often a valuable sign of insufficient kidney activity—in short, of so-called kidney inefficiency.—From "Pathologie des Harnes," Blumenthal.

Urine testing by Cryoscopy. B.M.J. i.,06,1063.

Blood Pressure is determined by some form of the **Riva Rocci Sphygmomanometer**, *e.g.*, that of **Lockhart Mummery.**

Directions.—The cistern of the manometer is filled with mercury up to the zero mark after removing the two rubber caps. The armlet should be wrapped round the patient's arm above the elbow and then strapped on. One end of the rubber tube should be attached to the armlet and the other end to the cistern of the manometer, the inflator and liberating valve being in the middle. The left hand should be used for feeling the pulse, and, with the inflating bulb in the right hand, air should be pumped into the apparatus until the pulse at the wrist is felt to stop. The pressure, as indicated by the manometer, at which this occurs should be read off ; and then (by a very slight turning of the milled head of the valve) allowed to decrease slowly, and the exact pressure at which the pulse returns at the wrist should be noted. This will be the maximum systolic pressure in the brachial artery. If there is much difference between the two readings the observation should be repeated. After each observation the pressure in the apparatus should be released. The maximum systolic pressure for an ordinary healthy adult is between 120 and 130 mm. of mercury *approximately*. In measuring pressures about, or above, 200 mm., the extra scale and tube should be added—the scale being first accurately fixed and then the short tube fitted into neck of main tube with a slight screwing action, as if stoppering a bottle. The armlet should be empty of air as much as possible before buckling the straps, the latter may with advantage overlap the armlet as indicated by the guides through which they pass. When applied the armlet should clasp the arm so gently as to be immovable and yet not interfere with the venous circulation. Another modification of the Riva Rocci Sphygmomanometer is that of **C. J. Martin.**

The **Hæmomanometer of Oliver** (Registered) consists of a glass tube receiving at one end a rubber tube, which leads to a rubber bag encircling the part of the limb of which it is desired to take the blood-pressure, and terminating in an air-chamber, which may be closed or opened by a screw (the air-block). Absolute Alcohol, coloured blue, is used as the indicator. The principle followed is to balance the blood-pressure by air-compression in the rubber bag, and to measure in millimetres of mercury that compression by the compression of the air in front of the index, which is practically free from inertia. By this arrangement the air within the apparatus, when the screw which forms the air-block is turned, becomes, as it were, a portion of the compressed air inside the bag and tubing, the degree to which the compression is carried being indicated by the lower end of the short column of coloured spirit interposed between the two areas of compressed air. Full directions for use are supplied with the apparatus, *vide* also L. ii./05,201. The advantages of this compressed air manometer with spirit index over the mercurial manometer are lightness, portability, &c., sensitiveness, horizontal scale, index free from inertia ; much more rapid and responsive than mercury manometers.

Viscosity of the Blood is determined by aid of the Viscosimeter (Du Pre Denning and Watson), which consists of a curved piece of capillary tubing with two arms. The long arm, 6 Cm. in length, has been blown out at its free end into a cup-shaped receiver with a thin edge. On the short arm, which is only about 2 Cm. in length, there is a small elliptical bulb, and the point at which the capillary enters and leaves this bulb is etched on the glass. The lobe of the ear is cleansed with ether, pricked, and the receiver of the Viscosimeter (*thoroughly dry*), previously warmed to the temperature of the body, is filled with the blood. As the blood travels in the capillary it is carefully watched through its course down the long limb and round the bend of the tube; a stop watch is held in readiness during this time, and the time taken to fill the elliptical bulb is compared with the time reading for water. This time value is a reliable comparative indication of the viscosity of the blood under consideration. The authors of the method suggest that a blood count should be conducted simultaneously, and that the temperature should be noted.

Hæmatoxylin Test Solution, U.S. 0·2% Hæmatoxylin, $C_{16}H_{14}O_6+3H_2O=353·18$ (356·16 I. Wts.), in alcohol. About 5 drops for a titration. Assumes yellow to orange colour in acid solution and violet to purple in alkaline. The titration is complete when the change in colour remains permanent on adding 1 drop of volumetric solution after stirring.

Ehrlich-Biondi Stain. *Syn.* Ehrlich-Biondi-Heidenhain Mixture, Ehrlich's Triple Stain.

This nuclear stain is prepared by dissolving separately Methyl Green 1 Gm. in water 200 Cc., Acid Fuchsin 1 Gm. in water 80 Cc., Orange G. 4 gm. in water 400 Cc., and mixing afterwards. The stain is then ready for use; it is *not* to be further diluted. Sections should be allowed to stain from 6 to 24 hours. Dehydration is effected with Alcohol, and the sections are cleared with Xylol, and mounted in Xylol Balsam.

Slides stained 2 to 10 minutes by this process show:—

Erythrocytes, orange.

Neutrophile Polymorphonuclear Granules, violet.

Neutrophile Myelocytes, violet.

Acidophile Granules of the Polymorphonuclear Cells, brick red.

Basophiles, not stained.

Lymphocytes. Nuclei, pale greenish blue. Cytoplasm, faint pink or grey.

In disease the nuclei of the erythroblasts are greenish black. This triple stain should be distinguished from—

Ehrlich's Triacid Stain.

Orange G. saturated aqueous solution 12, Acid Fuchsin saturated aqueous solution 8, Methyl Green saturated aqueous solution 10, water 30, absolute Alcohol 18, Glycerin 5.

The former of these two stains is the more used. The Triacid Stain appears to be more powerful, but is perhaps less delicate.

Ehrlich's Hæmatoxylin Solution.

Dissolve Hæmatoxylin 1·5 gm. in Alcohol Absolute 100 Cc., and mix the solution with a 100 Cc. of saturated solution

f Ammonia Alum in water to which has been added Glacial cetic Acid 5 Cc. and Glycerin 100 Cc.

Ehrlich's Acidophilous Mixture consists of Eosin 1, ndulin 1, Aurantia 1 in Glycerin 15.

Grenacher's Alum Carmine. Carmine 1, Alum 5, ater 100. A small amount of Phenol may be added to reserve. For nuclei and muscle staining.

Grenacher's Hæmatoxylin Solution. Dissolve Ammonia Alum 45 in water 430. Dissolve separately Hæmatoxylin 2·4 in absolute Alcohol 12 Mix and llow to stand 14 days. Filter and add Glycerin 66 and cohol 90% 75 Cc.

Delafield's Hæmatoxylin Solution is similar.

Mayer's Borax Carmine. This solution is prepared y boiling Alcohol, 70% with Carmine and Borax in excess, nd filtering after cooling.

Mayer's Carmalum. Carmine 2, Alum 5, boil 1 hour ith water 100, filter.

Mayer's Hæmalum. — Hæmatein [$C_{16}H_{12}O_6$=297·84 (300·096 I. Wts.)] 1, dissolved in Alcohol absolute 50. Mix his solution with one of Alum 50, in water 1,000.

Mayer's Acid Hæmalum consists of the above, with % Acetic Acid added.

Mayer's Hæmatoxylin or Kleinenberg's Hæmatoxylin Solution. To a saturated 70% lcohol Solution of Alum and Calcium Chloride, diluted with times the amount of Alcohol of the same strength, is added lcoholic Solution of Hæmatoxylin, until the characteristic olet colour is produced.

Mayer's Paracarmine.—Carminic Acid 1, Aluminium hloride 0.5, Calcium Chloride 4, in Alcohol 70% 100.

Mayer's Picrocarmine.—Saturated Picric Acid solution is added to a solution of Carmin 8 Gm., in 100 Cc. of mmonia until a precipitate commences to form.

Perenyi's Solution (Hardening Reagent).—Dissolve hromic acid 0·15 Gm. in water 30 Cc. and add alcohol 30 Cc. nd nitric acid (10%) 40 Cc. Employed for fixing plant and nimal preparations.

Picro-Nigrosin (Martinotti's).—An aqueous saturated solution of picric acid and nigrosin.

Picro-Sulphuric Acid (Kleinenberg-Mayer).—According to Mayer a saturated solution of picric acid in 2% ulphuric acid, containing a few drops of creosote in the inished product. For use dilute 3 times. According to leinenberg 3% of sulphuric acid is employed. In use 1 Cc. the filtered solution is diluted further with 3 Cc. of water.

Van Gieson's Stain. Saturated aqueous Acid Fuchsin olution 2, saturated Picric Acid solution 100.

Chlorides in Urine.

Instead of evaporating and incinerating with ammonium nitrate, oxidise the organic matter contained in 10 20 Cc. urine with potassium permanganate, *q.s.*, and lphuric acid 2 Cc., warm, then neutralise with potash presence of litmus paper. Dilute to 50 Cc. with

water, add potassium chromate and titrate with silver nitrate as usual.—Allen, P.J. ii./04,8.

Creatinine.

Glycocoll-Methyl-Guanidin.

$$NH = C \begin{cases} NH.CO \\ N(CH_3).CH_2 \end{cases} \quad \text{or} \quad C_4H_7N_3O = 112{\cdot}34 \quad (113{\cdot}176 \text{ I. Wts.}).$$

To detect this body add a little Sodium Nitro-Prusside and Caustic Soda. A red colour develops which fades on boiling the mixture. If a little Acetic Acid be added to the boiling liquid, Prussian Blue is produced.

Cystin.

$CH_3-C.NH_2.S-CO.OH)_2=238{\cdot}5(240{\cdot}296$ I.Wts.).

Is occasionally found in urinary deposits as transparent six-sided crystals—insoluble in alcohol but soluble with ease in mineral acids, caustic alkalis and ammonia. Uric acid occasionally crystallises in similar form, but gives the murexide reaction; Cystin does not.

Recent research on some problems of urinary excretion.—L. i./06,674.

Glucose Tests.

Diabetic and non-diabetic glycosuria, *i.e.*, the dangerous disease diabetes in which oxybutyric acid (*v. p.* 828) and its derivatives are passed, designated 'composite diabetes,' and in which coma may set in; and the relatively harmless alimentary glycosuria have to be distinguished. Five kinds of glycosuria are enumerated. —B.M.J. i./03,667; L. i./06,676. Significance of small quantities of sugar.—B M.J. i./06,126.

Fehling's Solution, Solution of Potassio-Cupric Tartrate (*Off.*).

No. 1. Copper Sulphate 34·64, Sulphuric Acid 0·5, Distilled Water to 500.

No. 2. Sodium Hydroxide 77, Sodium Potassium Tartrate 176, Distilled Water to 500.

Mix equal volumes when required. Of this, 10 Cc. will be decolorised and reduced by 0·05 Gm. (or 53 minims = ¼ grain) of glucose or diabetic sugar in solution, with precipitation of yellowish red cuprous oxide, when the two are boiled together. No. 2 solution should not be kept in a very cold place, or it may crystallise. By keeping the copper solution separate

from the alkaline solution the test is prevented from becoming erroneously sensitive.

The addition of a little (two teaspoonfuls for each analysis) precipitated Calcium Carbonate or Barium Sulphate throws down the cuprous oxide mechanically, and enables the colour of the supernatant liquor to be more easily seen.—L.i./03,1737.

The growth frequently occurring in Fehling's Solution is due to Chætocladiæ, sub-class Phycomycetes, class Fungi. Also found in old Eosin and Fluorescein solutions. Consists of cells in the Zoogloœa stage.—P.J. ii./04,571.

Cupric Pellets,—the salts of Fehling's Solution are prepared compressed into tablets.

Glass Capsules, containing about 1 Cc. of Fehling's Solution, are also prepared.

Glycuronic Acid, $C_6H_{10}O_7$=192·62 (194·08 I. Wts.), Uric Acid, Creatinine, Pyrocatechin (*see p.* 415), Hydroquinone (*see p.* 415), Salicylic Acid Compounds, Chloral, Chloroform and similar bodies reduce Copper Solutions, these may be removed by simple repeated **filtration** through **animal charcoal.** None of these bodies **ferment** or give **Osazone Crystals.** (*Vide* Phenylhydrazin, *pp.* 846, 847).

Creatinine to extent of 3 mgr. per cc. may be present in normal urine.—L. i./06,779.

Ammoniated Cupric Test (Pavy).

Tartarated Soda, and Caustic Potash, of each	178 grains.
Distilled water	*q.s.*
Dissolve and add in aqueous solution	
Copper Sulphate	36½ grains.
When cold add	
Strong Solution of Ammonia, sp. gr. 0·88 ...	6 ounces.
Distilled Water... ... ... to	1 pint.

This solution is not hyper-sensitive. Ammonia is a solvent for the cuprous oxide, yet it does not interfere with the reduction of the oxide in sugar testing. 10 Cc. of the solution further diluted are kept boiling in a flask, air being excluded, while the urine *q.s.* is added to discharge the colour; this solution is one-tenth the strength of Fehling's solution, 10 Cc. of it are equivalent to 0·005 Gm Glucose.

Glass Capsules containing 10 Cc. of this solution are prepared.

Fehling's Test, Allen's modification.—For small quantities of sugar in urine. Heat 8 Cc. of the urine to boiling point and add 5 Cc. of the copper solution, cool and add 2 Cc. saturated solution of sodium acetate, slightly acidified with acetic acid, to complete precipitation of uric acid, phosphates,

and xanthine. Filter, add 5 Cc. of the alkaline solution, and boil for a few seconds. If more than 0·25 per cent. of sugar be present, cuprous oxide is precipitated before boiling point is reached, but if less than this proportion, it is deposited during cooling.—Analyst, xix.178; P.J. ii./95,307.

Haines' Modified Method, in one solution composed of: Copper Sulphate 3 Gm., Caustic Potash 9 Gm., Glycerin 100 Gm., Water 600 Cc.—P.J. ii./97,57.

Barfoed's Reagent.—Neutral Copper Acetate (*see p.* 312) 13·3, Acetic Acid solution (1 per cent.) 200. A Glucose solution warmed with a small quantity of this precipitates Cuprous Oxide.

Fermentation Test.—This test is simple and practically infallible. Prior to conducting, determine the specific gravity of the urine as exactly as possible. Then fill a Doremus tube completely with the specimen; place a little fresh yeast in the bend; keep in a moderately warm position for 24 hours. If sugar be present, carbon dioxide will be produced, and the gravity of the urine will fall—each degree of density lost being equivalent approximately to 1 grain of glucose per ounce.

Gerrard's Solution.

This is prepared by diluting a 100 Cc. mixed Fehling Solution with about 300 Cc. of water and almost decolourising, whilst boiling, with 5% solution of Potassium Cyanide (about 63 Cc. are required), and making up the volume when cold to 500 Cc.

For the Estimation of Sugar by this Process.—Mix 50 Cc. of the solution with 10 Cc. of mixed Fehling's Solution (5 Cc. Fehling's No. 1, and 5 Cc. Fehling's No 2). Boil in a basin and pour into it, whilst boiling, diluted urine, ½ to 1 Cc. at a time by means of a burette, until the blue colouration just disappears, taking care not to add an excess. An average diabetic urine may be diluted 1 with water to 10.

The calculation is then simple—as in the case of the Fehling method:—

The number of Cc. of actual undiluted urine used contains 0·05 Gm. of Glucose. From this the "percentage"—grammes per 100 Cc.—is easily obtained. To convert this into grains per fl. oz. multiply by 4·375. This quotient multiplied by 20 gives the number of grains of Glucose per pint.

The following table will be found useful :—

Urine diluted 1 with Water to 10.

No. of Cc. of diluted Urine used.	Gm. Sugar per 100 Cc.	Grains per fl. oz.	Grains per pint.
4·0	12·5	54·69	1093·80
4·5	11·1	48·56	971·20
5·0	10·0	43·75	875·00
5·5	9·1	39·86	797·20
6·0	8·3	36·35	727·00
6·5	7·7	33·73	674·60
7·0	7·1	31·10	622·00
7·5	6·7	29·35	587·00
8·0	6·3	27·59	551·80
8·5	5·9	25·84	517·80
9·0	5·6	24·97	499·40
9·5	5·3	23·21	464·20
10·0	5·0	21·90	438·00
10·5	4·8	21·02	420·40
11·0	4·5	19·71	394·20
11·5	4·3	18·83	376·60
12·0	4·2	18·40	368·00
12·5	4·0	17·52	350·40
13·0	3·8	16·61	332·20
13·5	3·7	16·21	325·20
14·0	3·6	15·77	314·40
14·5	3·4	14·86	297·20

For less quantities of sugar a stronger dilution is recommended. The following gives the results with the urine diluted with an equal volume of water :—

Urine diluted 1 with Water to 2.

No. of Cc. of diluted Urine used.	Gm. Sugar per 100 Cc.	Grains per fl. oz.	Grains per pint.
3·0	3·30	14·45	289·00
3·5	2·90	12·70	254·00
4·0	2·50	10·95	219·00
4·5	2·20	9·64	192·80
5·0	2·00	8·76	175·20
5·5	1·80	7·88	157·60
6·0	1·70	7·45	149·00
6·5	1·50	6·57	131·40
7·0	1·40	6·13	122·60
7·5	1·30	5·69	113·80
8·0	1·25	5·49	108·80
8·5	1·18	5·17	103·40
9·0	1·11	4·86	97.40
9·5	1·05	4·60	92·00
10·0	1·00	4·38	87·60
10·5	0·95	4·15	83·00
11·0	0·91	3·96	79·20
11·5	0·87	3·81	76·20
12·0	0·83	3·64	72·80
12·5	0·80	3·50	70·00
13·0	0·77	3·37	67·40
13·5	0·74	3·24	64·80
14·0	0·71	3·11	62·20
14·5	0·69	3·09	61·80
15·0	0·67	3·00	60·00

If the urine contains less sugar than this, it is desirable to use the urine in an undiluted condition.

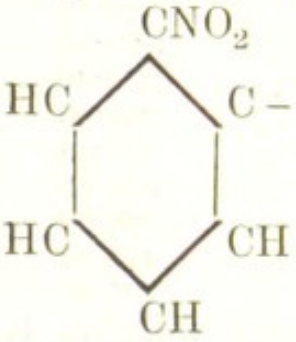
The calculation is then as before: the number of Cc. of actual urine used contain 0·05 Gm. of Glucose.

Gowers' Test for roughly estimating glucose:—

Dilute with an equal volume of Liquor Potassæ, this makes all urine pale enough to prevent important error in such a rough test. Boil the upper half well but not too long—a lemon tint corresponds to about 5 grains per fluid ounce, a pale sherry to 10 grains, a dark sherry to 15 grains, and a port wine tint to 20 grains and upwards.

Johnson's Test.—*See* Picric Acid, *p.* 847.

Nitropropiol. Sodium Orthonitrophenylpropiolate. $C_9H_4Na(NO_2)O_2$, or



$=211{\cdot}53$ (213·122 I. Wts.).

Has long been used for detection of sugar in diabetic urine. Owing to reduction, indigo blue colour is produced, or indigo-blue itself precipitated. Recently tablets prepared.—C.D. i./00,29; L. i./00,471,882,1321; ii./01,1028; L. i./02,183. This reaction is based upon Bayer's synthesis of indigo-blue, which is briefly:—Cinnamic Acid → Orthonitrocinnamic Acid → Dibromo compound of → Orthonitrophenylpropiolic Acid, which, warmed with alkali, decomposes thus:—$2C_9H_5(NO_2)O_2 = C_{16}H_{10}N_2O_2$ (Indigo Blue) + $2CO_2$ + O_2. This substance is to be distinguished from Sodium phenyl-propiolate (*Syn.* Thermiol), *v. p.* 28.

Nylander's Reagent.

Bismuth Subnitrate 2, Rochelle Salt 4, Sodium Hydroxide Solution (8%) 100, and **Almen's** re-agent consisting of Bismuth Subnitrate 1, Rochelle Salt 2, Potassium Hydroxide Solution (35% strength) 50, are used for detecting Glucose. A small quantity of either warmed with the urine will blacken if glucose be present.

Phenyl-hydrazine Hydrochloride, $C_6H_5.NH.NH_2.HCl. = 143{\cdot}53$ (144·602 I. Wts.), is used as a test for sugar. It is in colourless, shining,

crystalline scales; and should be free from azo-compounds. A small quantity is warmed with twice its weight of sodium acetate in solution, an equal volume of the suspected solution added, and boiled for 20 minutes. On cooling, yellow crystals of phenyl-glucosazone, $C_6H_{10}O_4(N_2H.C_6H_5)_2$=355·66 (358·336 I. Wts.), are deposited if sugar be present.—B.M.J.i./01,453,454; L.ii./04,211,329,564. This substance should be handled with care as it may produce eczema.—Brit. Jl. Dermatology, Aug. 1905.

Picric Acid. JOHNSON'S TEST. This has been suggested as a test for glucose in urine, as a solution of this sugar, if boiled with Picric Acid and Solution of Potash, reduces the yellow Picric Acid to the deep red Picramic Acid, $C_6H_2(NO_2)_3OH + 9H_2 = C_6H_2(NH_2)_3OH + 6H_2O$ = 138·16 (139·192 I. Wts.) forming Potassium Picramate (M.W. 175·99) (177·334 I. Wts.), the depth of colour depending on the amount of sugar. By the aid of **Johnson's Picro-Saccharimeter** this reaction is made a quantitative test.

Solution for use with same: Strong Solution of Ferric Acetate (B.P.'85) 15 drachms, Glacial Acetic Acid 7½ ounces, Ammonia Solution 0·959, 3¾ ounces. Water to 3 pints.

Safranine Solution.—1 in 1,000. One volume of this, with one of urine and one of liquor potassæ is heated to boiling, avoiding agitation. If the urine contain sugar to the extent of 0·1% the liquid will be decolorised. Each additional volume of the safranine solution that may be decolorised represents roughly 0·1% of sugar.—L. i./95,314.

Alkaptonuria (rare), due to presence of Di-oxy-phenyl-acetic Acid, $C_6H_3(OH)_2CH_2.COOH$ = 166·8 (168·064 I. Wts.). Urine reduces Fehling's Solution, and turns brown with alkali.

Glycerin.

Glycerin in the urine is claimed to be indicative of pancreatic disease and to result from the decomposition of fat. For the method of detection, which depends on the formation of crystals with phenyl-hydrazin, *vide* L.i./04,783; L. i./05,14. Value of Cammidge's Test questioned. At any rate the urine

must be perfectly fresh.—B.M.J. i./06,438. Chronic pancreatitis with notes of examinations of the urine, blood and fæces by Cammidge.—L. ii./05,1824.

The pathogeny of diabetes.—(Pavy), L. i./06,1230.

Indican Test.

Indican, Potassium Indoxyl Sulphate, $C_8H_6NSO_4K$ =249·39 (251·298 I. Wts.), may be detected by **Ehrlich's Test**: a Solution of 0·33 Gm. of Dimethyl-amidobenzaldehyde in water and strong Hydrochloric Acid of each 50 Cc.

Boil the urine with an equal quantity of this solution. Cool and render alkaline with Ammonia or weak Potash Solution. If Indican be present a red colour results.

Jaffe's Test.—Indican may also be detected by adding to the specimen an equal volume of strong Hydrochloric Acid, and adding drop by drop concentrated Liquor Calcis Chlorinata; blue coloration, due to Indigo, if Indican present, which may be taken up by shaking with Chloroform. If shaken with Ether this solvent will dissolve the Indigo-Red. Natural Indigo is obtained from *Indigofera Tinctoria* and *I. Anil* (*Leguminosæ*).

Indoxyl. $C_8H_5(NH)OH$=132·1 (133·096 I.Wts.).

Add an equal volume of hydrochloric acid. Shake and add a drop or two of sodium hypochlorite solution. Blue colour appearing indicates presence. May be shaken into a small quantity of chloroform to render more evident.

Nitrogen.

The quantity in Urine is approximately 0·9% as an average—(90% of this is in the form of urea).

Determination. — Heat 25 Cc. in porcelain basin with 10 Cc. of strong Sulphuric Acid until volume reduced to about 10 Cc. Finally, add about 5 Gm. of Potassium Sulphate to the residue in a flask in inclined position with small funnel in neck to act as condenser. Heat until colourless; cool and add very cautiously 20 Cc. water drop by drop, and introduce with utmost care a strong solution of Caustic Soda to alkalinity, for Kjeldahl method by distillation into a known quantity of Standard Acid and ultimate back-titration with alkali, or to near neutralisation by this modified method. Make up volume to 100 Cc; take of this 10 Cc. =

2·5 Cc. of original urine, and treat this quantity with Hypobromite in a Doremus or other form of Urea Apparatus.

In this way 24 Cc. of moist Nitrogen

= approx. 0·028 Gm. Nitrogen or
= 0·034 „ Ammonia
= 0·06 „ Urea.

Ammonia

In urine may be estimated by distillation and Nesslerisation of the distillate or by aid of Volumetric Acid, as above.

The average amount of total ammonia in urine is 0·03% by weight. It has been pointed out that there is a marked increase in the proportion of Ammonia to total Nitrogen—it may rise from the normal proportion 3 to 5%, up to even 45%, of the total Nitrogen—in women suffering from pernicious toxæmia. Vomiting of pregnancy indicates the existence of a serious toxæmia, which, if permitted to continue, will be found to be accompanied by lesions of the liver and other organs inconsistent with life. A coefficient of 10%, according to the author, is a danger signal.—L. ii./05,1172.

Phosphates in Urine.

(Mean content is 0·15 to 0·2% P_2O_5.)

These are estimated by means of a **Standard Uranium Nitrate Solution**, prepared by dissolving 35 Gm. of the Nitrate in 900 Cc. of water, and standardising it against 50 Cc. of a solution of 5·042 Gm. of pure Sodium Phosphate (*Off.*) in 1 litre of water; 5 Cc. of a solution of Sodium Acetate 100 Gm., with 100 Cc. of Acetic Acid in water *q.s.* to 1 litre is added, both in standardising and in the estimation of the sample of urine. A few small crystals of Potassium Ferrocyanide on a white tile serve as indicator, the Uranium Nitrate Solution being added to the *hot* Standard Phosphate Solution (or the specimen) until a drop removed by the aid of a rod commences to cause a brownish precipitate with them. This amount of the Uranium Nitrate Solution corresponds to 0·05 Gm. P_2O_5. The solution may either be diluted so that 10 Cc. shall be equivalent to this quantity (1 Cc. of the Uranium Solution = 0·005 Gm. P_2O_5), or better, its strength may be noted and verified from time to time; 50 Cc. of the urine is the

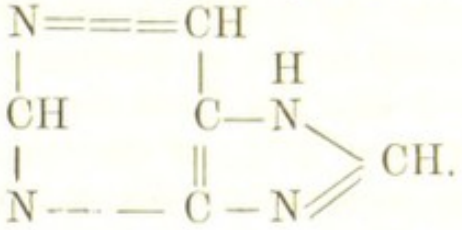
quantity taken for examination, the conditions being the same as above.

Or the Phosphate Solution may be run into the Uranium—the end reaction being clearer, the disappearance of the brown colour is said to be more easily visible than its formation.—P.J.ii /04,9.

Purins.

Of the known Purin bodies, Xanthin, Hypoxanthin, Adenin, Guanin, Caffeine, Theobromine, are met with in food, and Uric Acid, Xanthin, and traces of Methyl-xanthin are found in urine.

The name Purin was given by E. Fischer to the body—



They all contain the grouping C_5N_4—Xanthin is dioxypurin, Uric Acid is trioxypurin. Uric Acid is in the largest proportion of the purins—about 10 to 1 of the others.

A purinometer has been designed for estimating. Full directions are supplied with the apparatus.—L. i./03,899; ii./03,471; B.M.J. i./06,300.

Purin in human fæces.—Walker Hall, B.M.J. ii./03, 583; i.04,819.

Walker Hall's further directions for using his purinometer, together with tables.—B.M.J. i./06,129.

Solutions for use:—

Solution No. 1.

*Ludwig's Magnesium Mixture	...		100 Cc.
Ammonia (20%)	...	...	100 Cc.
Talc, in fine powder	...	...	10 Gm.

Solution No. 2.

Silver Nitrate	...	...	1 Gm.
Ammonia (strong	...	...	100 Cc.
Talc, in fine powder	...	...	5 Gm
Distilled Water	...	...	100 Cc.

(Both Solutions require vigorous shaking before use.

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* Magnesium Chloride, crystalline ... 110 Gm.
Ammonia Solution ... ... 250 Gm.
Ammonium Chloride ... ... 110 Gm.
Water ... ... 1 litre.

Urea in Urine, Estimation of.

Average 2·5 to 3%, or about (in health) 500 grains (33 Gm.) per diem; it may range between 15 and 40 Gm. The majority of methods are based on the decomposition of Urea into nitrogen, carbon dioxide, and water, when treated with sodium hypobromite. The carbon dioxide is absorbed by the excess of alkali present, and the nitrogen can be measured, from which, on reference to tables, the percentage can be found—theoretically 1 Cc. of nitrogen at 0° C. = 0·0027 Gm. approximately of Urea. In the process about 8% of the total nitrogen is suppressed, but the increase in volume of the gas due to the room temperature (taken as 18° C.) and the vapour tension (the gas being measured moist) has been found to almost exactly compensate for this loss in practice.

For Sodium Hypobromite Solution, *v.p.* 660.

A little Glucose added to a urine increases the evolution by preventing a secondary reaction—formation of Cyanates and Nitrates—but, as indicated above, this is compensated for.—B.M.J. i./03,194,288,341,403.

The **Doremus** form of Ureometer is graduated on the one side in decimal parts of a Gm. of Urea obtained from the 1 Cc. of Urine operated upon, and on the other, the figures 5, 10, 15, and intermediate ones indicate grains of Urea per fluid ounce.

A Portable **Urine Test Case** is arranged, containing the apparatus and reagents for the qualitative and approximate quantitative examination of urine for albumin, glucose and urea. — B.M.J. ii./99,1556; L. ii./99,1005; P.J. ii./99 344c.

A separate **Urea Apparatus** is also arranged.—C.D. ii./01,835.

See also Nitrogen *p.* 848.

Uric Acid in Urine, Estimation of.

Luff expresses the opinion that Uric Acid possesses no toxic properties whatever.—L. ii./05,1864.

Uric Acid when pure is in white crystals, very slightly soluble in water, insoluble in alcohol and ether.

Heated to dryness on a water bath, with a little Nitric Acid or Potassium Chlorate and Hydrochloric Acid in a white dish, cooled, and a little Ammonia solution carefully added gives red colour.—**The Murexide Reaction.**

(Mean Content 0·05 to 0·06%) **Hopkins' Method.** To 200 Cc. of sample add about 30 Gm. Ammonium Chloride in

powder, dissolve as completely as possible, or a small quantity may remain undissolved, add a little ammonia to neutralise and allow to stand 10 minutes. Filter off the precipitated Acid Ammonium Urate, wash with saturated Ammonium Sulphate solution* and rinse off the precipitate from the filter with water to 100 Cc. Add 20 Cc. Concentrated Sulphuric Acid to raise temperature of the liquid to about 60°C., or, if necessary, warm to that temp. Titrate with $N/_{20}$ Potassium Permanganate (1·578 Gm. in 1 litre), taking as end-reaction the point at which the Permanganate ceases to be instantly decolorised. Each Cc. of the Permanganate Solution = 0·00375 Gm. Uric Acid.

The **Gowland-Hopkins' method** is as above to *, then proceed as follows:—Wash off the precipitate into a small beaker with a jet of hot water, add a little hydrochloric acid, and heat to just boiling. Allow to stand two hours in the cold. Collect the separated Uric Acid measuring the filtrate at the same time, for which an allowance of 1 mg. must be added on to the final result for every 15 Cc.; it need not exceed 20 to 30 Cc. Wash the uric acid crystals with a little distilled water, rinse off the filter with hot water, warm with sodium carbonate till dissolved and make up with water to 100 Cc. Add 20 Cc. Sulphuric Acid and titrate with Permanganate as above, adding slowly towards the end of the reaction, the finish being the first appearance of a pink colour which is permanent for an appreciable interval. Previously the disappearance of the colour is instantaneous. —P.J. i./99,266.

The acid Ammonium Urate may also be decomposed by means of Hypobromite.—L. ii./03,471.

Uric Acid Outfits are arranged containing Glass Tubes of Concentrated Permanganate Solution to produce extemporaneously 100 Cc. of $N/_{20}$ Potassium Permanganate, and the other solutions and apparatus necessary for the entire estimation either by the Hopkins or the Gowland-Hopkins' method.

Bartley's Method.

Ammonio-nitrate of silver precipitates Uric Acid completely from solution:—

50 Cc. of sample treated in porcelain basin with 5 Cc. Magnesia mixture (10 Gm. Magnesium Sulphate, 12 Gm. Ammonium Chloride, 100 Cc. Ammonia, S.G. 0·960) and 10 Cc. Ammonia (S.G. 0·960). Heat to nearly boiling and add while quite hot from a burette $\frac{1}{50}$ normal Silver Nitrate (3·4 Gm. per litre); after each addition test for presence of Ag in solution with drops of Ammonium Sulphide. A deduction of 0·5 Cc. from the amount of Silver Nitrate Solution is to be made. One Cc. of same = 0·00336 Gm. Uric Acid.—Allen, P.J. ii./04,8.

Acidity of Urine.

The **Acidity of Urine**, due mostly to the Sodium Acid Phosphate, is determined by titration with Decinormal Alkali using Phenolphthalein as indicator. Each Cc. of this standard solution = 0·012 Gm. of Sodium Acid Phosphate. Acidity is frequently reported in terms of the number of Cc. of this

Alkali per 10 Cc. of Urine, *e.g.*, 3 Cc.=3°. The **Alkalinity** may be given in similar manner.

The nitrogenous compounds in Urine, (i) Uric Acid; (ii) Creatinine; (iii) Urea, may be fractionally precipitated by special reagents.—C.D. i./03,430.

The urine of half-a-dozen individuals in health was found to have the following 'degrees' of acidity—0·8°, 0·6°, 0·9°, 4·4°, 5·5°, 7·2°.

It was noticeable that this gradation did not correspond with the acidity as shown by delicate litmus paper—on the contrary, the two with 0·9° were distinctly different.

WATER ANALYSIS NOTES.

Work in an atmosphere ammonia-free. The sample of Water should be received in a 'chemically clean' Winchester quart-stoppered bottle, and dated. Note **Physical Characters**, smell, taste, sediment, and colour in a 3 feet tube.

Total Solids are ascertained by evaporating the 100 Cc. in a platinum crucible on water-bath, the result being expressed in parts per million. The quantity being determined, it is essential that the amount of volatile and non-volatile matter should be determined, or, in other words, the amount of organic and inorganic solids, or those that will disappear on ignition and those that will not. Also notice the appearance on ignition, *i.e.*, charring (indicating organic matter), fuming, scintillation, &c.

Oxygen absorbed.—Warm ½ litre of the sample about 20 minutes in a flask with 1 Gm. $FeSO_4(NH_4)_2SO_4.6H_2O$ acidified with dilute Sulphuric Acid, then back-titrate with $^N/_{10}$ Potassium Permanganate.

Free and Albuminoid Ammonia.—Prepare some water, NH_3 free, by acidulating some good tap water with Sulphuric Acid, about 2 drops of a 1 in 3 solution to a litre of water and distilling. By so doing (the retort and condenser being chemically clean) even the first drop of distillate is Ammonia-free. Distillation may proceed, but must not be pushed too far. The distillate should be Nesslerised to verify its purity. Distil 500 Cc. of sample in a boiling flask with rubber cork to connect with condenser. Nesslerise each 50 Cc. of distillate with standard NH_4Cl. of which 1 Cc.=0·01 mg. NH_3. Add together the equivalent quantities of NH_3 and double the result to arrive at number of mgrs. of **Free Ammonia** per litre=parts per million. Stop distilling and add 50 Cc. of a solution of 0·4 Gm. Potassium Permanganate and 10 Gm. Potassium Hydrate which has been freshly boiled 20 minutes. Distil again and Nesslerise the **Albuminoid Ammonia** in 50 Cc. of the distillate at a time until it is NH_3 free. Add the equivalents together and double as above for parts per million.

Wanklyn divides waters into the following:—

Class I. Of extraordinary purity, yielding from 0·00 to 0·05 parts per million of Albuminoid Ammonia, which cannot be objected to organically. Class II. The general drinking waters

of this country, containing 0·05 to 0·10 parts Albuminoid Ammonia per million—this amount may be considered safe organically. Class III. Dirty waters, yielding more than 0·10 parts of Albuminoid Ammonia per million.

Nessler's Reagent for Ammonia (*Off.*).—*Syn.* SOLUTION OF POTASSIO-MERCURIC IODIDE.

Dissolve Potassium Iodide 7 and Mercuric Chloride 2½, in Distilled Water 160. To this add more of the Mercuric Chloride in solution until the precipitate no longer disappears on well stirring, and a slight permanent precipitate remains. Then add Sodium Hydroxide 24, dissolve, add a little more solution of Mercuric Chloride and Distilled Water *q.s.* to 200.

On the addition of this test to ammonia or an ammonium salt in solution, it lets fall a brown precipitate of Oxy-di-Mercuric-ammonium Iodide.

Chlorine. Titrate 100 Cc. in a white basin with standard $AgNO_3$ of which 1 Cc. = 1 mgrm. of Chlorine, using potassium chromate as indicator. The reagents must be Cl-free and the water must not have an acid reaction.

Nitrites. To 100 Cc. of the sample add a weak, slightly acidulated, colourless solution of Meta-phenylenediamine. Nitrites give an amber to mahogany colour according to the amount. Conduct a control experiment.

Nitrates. The test employed is to mix 1 part of saturated solution of a Brucine Salt with 3 parts of the specimen, and to 'layer' beneath this carefully 1 part of pure Sulphuric Acid—a pink coloration indicates their presence.

Total Hardness.—To 100 Cc. of specimen add the least amount of soap solution (standardised so that 1 Cc. = 1 mgrm. Calcium Carbonate or its equivalent) that will give a lather which will have an unbroken surface at the end of 5 minutes. 1 Cc. of the soap solution must be deducted from the amount required, as 100 Cc. of Distilled Water would require 1 Cc. to furnish a lather. The number of Cc. of soap solution required gives the number of mgrm. of Calcium Carbonate in the 100 Cc. of the specimen or the parts per 100,000.

Standard Soap Solution for the above determination:—Dissolve 10 Gm. of B.P. Hard Soap in 1 litre Alcohol 35%. 1 Cc. of this solution will contain soap approximately equivalent to 1 mgr. $CaCO_3$. To standardise to this equivalent dissolve 1 Gm. Powdered Marble or Calcium Carbonate in slight excess of Hydrochloric Acid, evaporate to dryness and redissolve in distilled Water, *q.s.* to 1 litre. Take, say, 12 Cc. of this solution, add Water to 100 Cc., and then Soap Solution, *q.s.*, to form lather as above. Adjust the Soap Solution until 13 Cc. are required. (100 Cc. of distilled water alone would consume approximately 1 Cc. of the Soap Solution in forming a lather.) We find London tap water varies between 15° and 17°.

Poisonous Metals.—Concentrate the water 5 times after acidulating with two drops of Hydrochloric Acid. Add Ammonium Sulphydrate solution. A darkening indicates Pb, Cu, or Fe, but not Zn. This darkened water should be divided into two parts. To one add Hydrochloric Acid—if darkness goes Fe is present. To the other portion add Potassium Cyanide Solution. If darkness goes now the metal

s Cu; if it does not, it must be Pb. This latter proceeding is, f course, only necessary when the darkness does not go with Hydrochloric Acid. Confirmatory tests should always be mployed. The confirmatory test for Fe and Cu is, to some riginal concentrated water in a test tube add Hydrochloric cid and Potassium Ferrocyanide; a blue results with Fe, nd a bronze with Cu. For Pb the Potassium Chromate test s employed. Zn gives a white precipitate with Ammonium ulphydrate, and a white precipitate with Hydrochloric Acid nd Potassium Ferrocyanide.

Phosphates should be tested for with 'Molybdic olution'; a yellow colour and precipitate ensues after 15 inutes if phosphates are present.

Welsh Water.—A pure soft water acts upon zinc, *e.g.*, n galvanised kettles, in a solvent way, so as to become angerous to health.—B.M.J.ii./05,1674.

MILK ANALYSIS.

Average Chemical Composition:—

Water approx. = 87·44%. **Milk fat** approx. = 3·81%; **Non-fatty solids**, 8·75; including the following, **Lactose** (average 4%); **Proteids** (Casein averages 3·5%); **Mineral matter.** Milk also contains small quantities of Citric Acid and an Enzyme.

The following data are necessary to determine quality of a specimen:—

(1) **The Specific Gravity** may be determined by a Specific Gravity bottle or Lactometer; the average reading is 1·031.

N.B.—Low gravity may indicate added water, or in some instances richness in fat.

(2) **To Determine Total Solids.** Evaporate 5 Gm. of the specimen on a water bath in a tared platinum capsule; the residue, which should be nearly white, averages 12·8%. Board of Agriculture requires at least 11·5%.

(3) **Fat.** Two determinations at least should be conducted, particularly if the figure for the non-fatty Solids is to be taken as the difference between the Fat result and that of the Total Solids. The following methods are suitable:—

(*a*) Fat extracted from Milk itself with a fat solvent, *e.g.*, Ether (Soxhlet & Werner-Schmidt methods).

(*b*) Fat extracted from Total Solids by suitable solvent. (Wanklyn's and James Bell's methods.)

(*c*) Milk treated with certain reagents (Gerber Process).

Other processes are those of Leffman-Beam, Stokes and Adams' Coil Process:—

A. 5 Cc. of the Milk is gradually poured on to a strip of fat-free blotting paper; this is placed in a Soxhlet tube in which it is exhausted by Ether, syphoning over it in the usual way. The Ether is then evaporated and the residual fat in the flask weighed.

N.B.—Curdled milk must be emulsified with Ammonia before treating.

B. The Total Solids, well pulverised, are treated with warm Ether which is filtered into a tared dish. The Ether is evaporated and the residual fat weighed.

C. To 10 Cc. of Sulphuric Acid (Sp. Gr. not less than 1·825) placed in a special graduated tube, add 1 Cc. of Amyl Alcohol and 11 Cc. of the milk to be tested. The tube is then closed with a rubber cork and centrifugalised. The fat solution in Amyl-Alcohol separates in two or three minutes, and is read off on the scale.

N.B.—It is well to notice that the Soxhlet method generally gives a result from 0·3 to 0·5% below the true result, *i.e.*, that obtained by method B.

Non-fatty Solids can be determined:—

(*a*) By subtracting the fat content from the Total Solids.

(*b*) By drying the Solids remaining after extraction of fat with warm Ether as in process B above.

Lactose, or Milk Sugar Estimation (Average content 4%).

Dilute 50 Cc. of sample with water 150 Cc., add a few drops of Acetic Acid to throw out Casein and Albumin, boil for a short time and after cooling make up to 250 Cc., finally allow to stand and filter. 5 Cc. of the filtrate represent 1 Cc. of the original milk. Into 5 test tubes marked '1' to '5' place 5 Cc.. of freshly mixed Febling Solution; dilute with an equal volume of water and add from a burette to No. '1' 3 Cc., to No. '2' 3·5 Cc., to No. '3' 4 Cc., to No. '4' 4·5 Cc., to No. '5' 5 Cc. of the above filtrate, place on a sand bath and boil for six minutes. According to the colour of the supernatent fluid in the tubes one notes whether the reduction is complete. It may be necessary to repeat the test, using intermediate quantities, *e.g.*, 4·1, 4·3, etc., Cc. of the filtrate. The calculation is on the following lines:—

In an experiment 4·15 Cc. of the filtrate were necessary. 1 Cc. of Febling Solution = 0·00675 Gm. Lactose ∴ 4·15 Cc. Filtrate = 0·03375 Gm. Lactose, *i.e.*, $\frac{4\cdot15}{5}$ Cc. Milk = 0·03375 Gm. Lactose ∴ 100 Cc. Milk $= \frac{0\cdot03375\times5\times100}{4\cdot15} = 4\cdot07$ Gm. Lactose.

Lactose Determination by Polarimeter:—

Add to 60 Cc. of the Milk 10 Cc. of a solution of Mercury in twice its weight of Nitric Acid 1·43 diluted with four times its volume of water. Make volume up to 102·4 Cc., filter. Note rotation in 200 m.m. tube,—divide by 2 and by 53 the specific rotation for lactose. Result is the amount of lactose per Cc. in the solution. Multiply by 100 to give the amount in 60 Cc.—*P.J.* ii./04,850.

Mineral Matter of Milk can be obtained by igniting the milk solids, and usually averages 8·3% of them.

N.B.—A dilution of normal milk with water will reduce the ash almost proportionately to quantity of water added, so the combination of a low ash and low non-fatty solids would point strongly to addition of water.

Casein Estimation (Average content 3·5%.).—Dilute 20 Cc. of the sample with 300 Cc. water, and add strong acetic acid drop by drop to complete precipitation. Pass in carbon dioxide for 20 minutes, collect the casein and fat on a weighed

filter paper; wash thoroughly with, firstly, alcohol, then ether to remove fat (well conducted in a Soxhlet thimble on water bath), dry and weigh.

For method of estimating proteids by Kjeldahl's process, see P.J. ii. /04,851.

Preservatives. The most commonly occurring are:—Salt, Sodium Bicarbonate, Boric Acid, Formalin, Hydrogen Peroxide, and Glycerin.

For Boric Acid, *v.p.* 8.

The presence of Formalin 1 part in 200,000 can be detected as follows:—

(*a*) Dilute the Milk with an equal volume of water and pour upon it Sulphuric Acid,—a violet blue coloured "ring" is produced, which lasts for several days.

(*b*) If to the distillate from a sample of milk one drop of a dilute aqueous solution of Phenol is added and the mixture poured upon some strong Sulphuric Acid in a test tube, a bright crimson ring appears.

In 1899 an Official Committee was appointed to inquire into the use of preservatives and colouring matters in food. The report contained the recommendation that the use of any preservative or colouring matter whatever in milk offered for sale in the United Kingdom be constituted an offence under the Sale of Food and Drugs Act. At the time of writing (June, 1906) legislation is still pending. Large quantities of Boric Acid and Borax are used in preserved meat. —Bevan.

We find Schiff's Reagent (*v.p.* 106, *q.v.* also for other tests) will give a colour with 1 of Formalin (40%) in 50,000 or even a drop in a gallon.

Bacteriological Standards for milk.—B.M.J. i./06,452. For *B. tuberculosis* in milk, *v.p.* 876.

CARBON MONOXIDE AND DIOXIDE TESTS.

Frequent deaths have recently occurred from Carbon Monoxide poisoning. Ordinary Coal Gas and Carbon Dioxide are also sources of danger.

Illuminating gas until recently consisted of Methane (Marsh Gas) 42%, Hydrogen 36%, Carbon Monoxide about 10%, Heavy Hydro-carbons 10%, with Nitrogen, Carbon Dioxide and Sulphuretted Hydrogen as impurities, and was obtained only from coal. The Ethylene (Olefiant Gas) and other Hydrocarbons are responsible for the lighting effects, whereas the Methane, Hydrogen and Carbon Monoxide are diluents. Of late years, however, gas companies have made more and more use of Water Gas produced by passing steam over red hot coke; this consists of about 40%

of Carbon Monoxide, and 60% of Hydrogen.* Varying amounts from 5 to 50% of Water Gas have recently been used as an addition to Coal Gas for illuminating purposes.

The following test will indicate one part of Carbon Monoxide in 10,000 parts of atmospheric air. Even ¼ to ½% of the gas is most injurious, and if inhaled for some time may be fatal (Schmidt).

10 to 20 litres of air are aspirated for about 15 or 20 minutes through 10 Cc. blood (fresh) diluted, 1 to 10 with water. The blood is then heated to the boiling point in a flask, and a current of air is passed into it which has previously passed through a solution of Palladium Chloride.† The air, which passes out of the blood, is then led into bottles containing Lead Acetate Solution, diluted Sulphuric Acid, and another quantity of diluted Palladium Chloride solution, in this order.

The presence of Carbon Monoxide in the air under examination is proved by the deposition of reduced Palladium metal in the last mentioned Palladium Chloride solution. A quantitative method on this principle is based on the fact that 106 parts of Palladium deposited are equal to 28 parts of Carbon Monoxide.

NOTE.—The blood used for the absorption of the Carbon Monoxide, as above mentioned, is to be heated immediately after the aspiration with the air under examination, and the passing of the air is to be continued three or four hours.

The gas may also be detected by the aid of the spectroscope. A little diluted fresh normal blood is shaken with the air to be examined. The hæmoglobin combines with the Carbon Monoxide, and the liquid shows spectroscopically two black absorption bands which correspond almost exactly with those of ordinary blood. But whereas this latter on addition of a little colourless Ammonium Sulphydrate Solution leaves only one band visible, occupying a position between the two referred to, the blood combined with Carbon Monoxide

* In addition Carbon Dioxide, Nitrogen, Methane. It should not contain any free oxygen. Full method of analysis, the solutions employed for examination are mentioned on *p.* 859.—C. D.i./06,160

† Palladium Chloride in 3% aqueous solution. *Dose.*—5 to 10 mimins before meals. Has recently been advocated for use in treatment of tuberculosis of the lungs. Said to improve appetite, and diminish the fever and coughing. Contra-indicated in nervous and neurasthenic patients.

is not affected by this addition—it shows the two bands even for several days.

Death from Carbon Monoxide due to imperfect stove. —L. i./03,258. Due to fire.—L. ii./05,1894. Carbon Monoxide is by some considered the cause of the injurious effects of tobacco smoking.—L. i./04,394.

Detection of Carbon Monoxide in the blood.

In addition to the spectroscopic method, **Kimkel's Colour Test** is valuable.

Necessary are a pipette, 2 small test tubes, and a 3% Tannin Solution.—For details of method see Dix and Mann's Forensic Medicine.—B.M.J. i./05,1382.

Note on the present day increase of Carbonic Oxide in illuminating gas.—L. i./04,1427.

Carbon Dioxide.—Haldane's apparatus for the estimation of this in the atmosphere has been recommended by a Departmental Committee inquiring into the ventilation of factories and workshops. The amount of air examined is 25 Cc., the process depending on absorption by a Volumetric Soda solution and ultimate titration. The Committee recommended that the amount of Carbonic Acid shall not exceed 12 volumes per 10,000, or 20 volumes where gas or oil is used for lighting purposes.

The statutory allowance of air to each person in factories and workshops is 250 cubic feet.—L. i./03,464.

Nickel Carbonyl, causing degeneration of certain parts of the nervous system, produced three deaths.—L. i./03,269,1842.

Antidote.—Oxygen.

For treatment of persons who have inhaled these noxious gases, fresh air, sulphur baths, good food with Quinine and Nux Vomica, Chloroform Liniment with friction for local neuralgia and commencing neuritis.—L. i./03,337 ; ii./03,117.

Orsat's Gas Apparatus.—SOLUTIONS FOR USE.

1. Caustic Potash 100 Gm., Distilled Water 100 Gm.
2. Potassium Hydroxide 120 Gm., Water 80 Gm. Pyrogallol 5 Gm., Water 10 Gm. Dissolve separately and mix.
3. Ammoniacal Cuprous Chloride Solution :—Copper Oxide 10·3 Gm ; Hydrochloric Acid, strong, 150 Gm. Dissolve. Fill flask up with copper shavings to reduce to Cuprous chloride and precipitate the solution in about 2 litres of water. Wash the precipitate with about 150 Gm. of water and pass into the mixture Ammonia vapour evolved from 200 Gm. of 0·880 Ammonia. Dilute the solution to 200 Gm.

II.—EXAMINATION OF STOMACH CONTENTS.

An **Outfit** is arranged containing the necessary **Reagents** and **Apparatus**. The **Reagents** include Blue Litmus* Paper, Congo Red (an anilin colour turned blue by acids and red by alkali, the reverse of Litmus, indicates absence of Hydrochloric Acid in the stomach in cases of cancer, as weak Lactic Acid does not interfere), Benzopurpurin Paper, Alizarin Solution, Dimethyl-amido-azobenzol Paper and Solution (an acid and alkali indicator which is not affected by Carbon Dioxide—a 1 in 500 Alcoholic Solution of the compound is used in ordinary chemical testing), Decinormal Soda Solution, Ether, Caustic Potash Solution, Phenolphthalein Solution (*Off.* 1 in Alcohol 90%, 300 with Distilled Water to 500, is reddened by alkali. but is not suitable for ammonia estimation), Cupric Sulphate Solution, Lugol's Solution, Methyl Green and Methyl Violet and other Test Solutions.

The **Stomach Tube** should have bevel-edged eyes known as "velvet eye." Van Valsah's tube is recommended by Herschell.† In this the smaller eye of the two should be on a level with and opposite the upper border of the other; this arrangement prevents possible blocking of the tube and injuring the lining of the stomach.

Glycerin Jelly, Lubricant, Aseptic, is supplied in 'collapsubes' for assisting the passage of tubes. A Glyco-gelatin Pastil of Menthol, gr. $\frac{1}{15}$, with Cocaine Hydrochloride $\frac{1}{20}$ grain, also is useful to be sucked just before passing.

Inflation of the stomach for diagnostic purposes is best carried out by the double bellows of a spray apparatus attached to a stomach tube.

Other methods of inflation are by giving first Tartaric Acid 30 to 90 grains in water, followed immediately by 40 to 120 grains of Sodium Bicarbonate, and Auto-inflation by means of Spivate's tube.

Portions of stomach contents are removed to examine for acidity, to ascertain the presence of food, mucus or gastric secretion, when it should normally be empty; to examine test meals and to search for pus, blood and bacteria.

Dunham's Tassel consists of a little tassel of thread soaked in Dimethyl-amido-azobenzol Solution. It is attached to a thread, the patient swallows it, it is removed after an interval, and the resulting colour gives the condition of the stomach as regards free Hydrochloric Acid.

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* Litmus is a blue pigment from *Roccella tinctoria* (*Discomycetes*). Litmus Solution (B.P. Appendix).—Boil litmus 2 with alcohol 90% 8 for 1 hour, pour off clear liquid, repeat with 6 and again with 6. Digest the litmus thus washed in distilled water 20, and filter.

† Manual of Intragastric Technique. G. Herschell, M.D. 1903.

Turck's Capsule consists of a Planten Capsule, No. 00, enclosing a small rubber tube attached to a thread for withdrawing, and provided with strips of Congo Red, Blue Litmus and Dimethyl-amido-azobenzol papers; after swallowing and withdrawing, the resulting colours will be:—

1. If stomach contents neutral, no change in colour of any of the Papers.
2. If no free acid, but only combined acid and acid salts, the Litmus will be red and the others unaltered.
3. If there be free organic acid, but no free Hydrochloric Acid, the Congo Red will be blackish blue, but the Dimethyl-amido-azobenzol Paper will be unchanged.
4. If free Hydrochloric Acid present, all the Papers will be changed—the Litmus red, the Congo Red blue, and the Dimethyl-amido-azobenzol Paper will be red.
5. If both Hydrochloric and Lactic Acid be present, the Congo Red Paper will have a blackish tinge.

The rubber tube will contain sufficient material for microscopic examination, *e.g.*, for the Oppler Boas Bacillus or Sarcinæ.

By means of **Einhorn's (silver) Stomach Bucket** a small quantity, about 2 Cc., may be lifted up out of the stomach and examined. By **Salzer's** method a small quantity may be pipetted out of the stomach with a stomach tube. By **Turck's Aspirator Bottle**, which is exhausted by means of a bulb, the stomach contents flow into the bottle. This is one of the simplest methods of removing stomach contents.

The **Water Test** for myasthenia consists in introducing into the stomach 300 Cc. of water first thing in the morning, fasting, and 1½ hours afterwards another 100 Cc. containing 1% of glucose. In due course a small quantity of the stomach contents are removed and the sugar estimated (*pp.* 842 and 844), from which is determined the amount of the original 300 Cc. remaining in the stomach.

Ewald's Test Breakfast consists of two or three ounces of dry bread and 10 ounces of hot water, or weak tea without milk or sugar. The Lactic Acid in bread vitiates the results where the presence of this acid is of importance, as in the early stages of cancer.

Boas's Test Breakfast (given after lavage) consists of one full tablespoonful of oatmeal to a quart of water, reduced to a pint by boiling. There are a variety of other test (meat and bread) meals.

Examination of stomach contents after Test Meals (for diagnosis, *vide* Herschell's Manual).

Microscopic Examination reveals starch, sarcinæ and the **Oppler Boas Bacillus**, present in malignant disease—this is best stained with Methylene Blue.

Chemical examination for acidity with Litmus Paper, which is affected by Hydrochloric, Lactic and Butyric Acids, Congo Red Paper, as already stated—the colour caused by organic acids will disappear on warming over spirit lamp whilst that due to Hydrochloric Acid remains.

Günzburg's test for free Hydrochloric Acid is apparently not reliable for Vomit, as by decomposition of

Sodium Chloride, and other salts, Hydrochloric Acid is evolved by heat Its use should therefore be restricted to the Ewald test breakfast. Its composition is :—

Phloroglucin 2 Gm., Vanillin 1 Gm., Alcohol 90%, 30 Gm. A rose red colour formed on warming a few drops with an equal amount of the specimen in a porcelain dish indicates presence of the Acid. May also be best kept in powder form—2 parts of Phloroglucin and 1 part of Vanillin. As much as will lie on the point of a penknife, added to a few drops of alcohol, forms a perfectly reliable solution.*

Dimethyl-amido-azobenzol in the form of test paper is reliable, turning red with a trace of Hydrochloric Acid.

Methyl Violet turns green with excess of Acid.

Benzopurpurin, dark red colour changes to light violet.

For **Lactic Acid,** Uffelman's Test is not satisfactory.

Distil off 30 Cc. from 40 Cc. of the filtered stomach contents the total acidity of which is known. The volatile acids go over ; the residue contains the Lactic and Hydrochloric Acids. The acidity of the distillate (found by titration with $^{N}/_{10}$ Soda, using Phthalein as indicator) deducted from the total acidity "A" (found by titrating 10 Cc. of the filtered stomach contents in the same manner, the result being expressed in terms of Hydrochloric Acid) gives the amount of Lactic and Hydrochloric Acids together. If the amount of HCl "H" (found in the same way as "A," but using Dimethyl-amido-azobenzol as indicator) be deducted from this, the remainder is Lactic Acid.

Acetic and Butyric Acids are detected by smell. The amounts of combined HCl. is designated "C" and the organic acid "O." For "C" Alizarin Monosulphonate 1% Aqueous Solution is used as indicator.

The **Free Hydrochloric Acid** of the gastric juice (contained normally to the extent of 0·18%) may also be determined by estimating (with a Saccharimeter or Polariscope) the inversion of a cane sugar solution added to the filtered stomach contents.—L. ii./03,315 ; B.M.J. ii./04,117.

Volhard's Process is recommended further. This process depends on driving off by heat (water bath and moderate Bunsen flame) the free Hydrochloric Acid, and the organic Chlorides.

Firstly, for **total Chlorides.** dilute 20 Cc. of the filtered gastric juice with 40 Cc. of distilled water, add 10 Cc. pure Nitric Acid and 5 Cc. of Solution of Iron Alum (10%), and 30 Cc. $^{N}/_{10}$ Silver Nitrate Solution. $^{N}/_{10}$ Ammonium Sulpho-

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* **Tropaeoline OO** and Methyl Orange (Helianthin) Official Solution, Methyl Orange 0·4, Alcohol (90%), 50, Water to 200, are yellow colours used for testing for the presence of free acids. The former is changed to crimson by acids, the latter to pink, but no change is produced by Carbon Dioxide, Acid Carbonates or Metallic Salts.

Günzberg's Capsule, for testing digestive power, consists of $\frac{5}{16}$ inch of thin rubber tubing, $\frac{1}{8}$ inch in diameter, containing 1½ gr. Potassium Iodide plugged with pledgets of Fibrin at each end.

cyanide Solution is then run in until permanent reddish brown tint results. The difference between the volume of the Silver Nitrate Solution and that of the Ammonium Sulphocyanide represents quantity of total chlorides as $N/_{10}$ HCl. (If amount of gastric juice very limited, the 20 Cc. can first be used for determining total acidity with $N/_{10}$ Soda and Phenolphthalein, as above indicated, before utilising the same for total chlorides.)

Secondly, heat 20 Cc. as already stated, charring thoroughly, but not so much as to volatilise inorganic Chlorides as well. Cool and add distilled water and Nitric Acid as for total Chlorides. The difference between first and second result gives the amount of ("physiologically active") Hydrochloric Acid.

All the methods of estimating Hydrochloric Acid in Stomach Contents are reviewed (L. i. 05, 1566), and important conclusions from results of a number of examinations in disease are deduced :—

(i.) *In gastric and duodenal ulcer total acidity is higher, i.e.*, from 0·2 to 0·3% or more—consisting almost entirely of active Hydrochloric Acid. Free HCl is usually present; organic acids usually absent; Peptone is absent or present in only small amounts.

(ii.) *In temporary dyspepsia* (*e.g.*, vomiting from migraine) total acidity about normal (from 0·1 to 0·2%) Free Hydrochloric Acid present or absent according to food at the time. Organic Acids may be present in small amount; Albumose and Peptone often present in considerable quantity.

(iii.) *In gastric carcinoma.* Nature of the juice depends on position of growth in the stomach: Conditions of the juice where the (*a*) cardiac and (*b*) pyloric portions were involved are described.

NOTE.—The authors of the paper carefully distinguish between "Free" and "Physiologically active" Hydrochloric Acid.

Test for the products of **Starch Digestion.** The presence of Erythrodextrin in any quantity (giving a brown colour with Lugol's Solution) one hour after a test breakfast will point to hypochlorhydria.

Rennin is tested for by adding a few drops of the filtered and neutralised stomach contents to two or three Cc. of milk, and maintaining the mixture at 98° F. for a quarter of an hour, resulting coagulation indicates presence.

For testing for **Rennin Zymogen**, a small quantity of Calcium Chloride is added prior to incubation. A pocket incubator may be used for these experiments.

Mucus normally is stained faintly, but that met with in chronic gastritis deeply with Methyl Green.

Blood is recognised microscopically.

Fermentation is examined by means of an ordinary Doremus Ureometer.

Estimation of the **digestive power** of the gastric juice is effected with hard boiled egg in the **pocket incubator** by examining for peptone after two hours or so.

Keratin Coated Planten's Capsules (largest size), filled with **Bismuth Carbonate**, and **Chain**

Cachets (2 inches of fine silver chain in a cachet attached o a piece of silk), are used for **X Ray examination** of the stomach.

For Lavage, a stomach tube, funnel, and graduated jug may be used; or a three-way tap or the Leube Rosenthal apparatus with Y tube, especially for autolavage.

Fæces, Examination of, after test meals (Baumstark).—L. i./06,1683,

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III.—BACTERIOLOGICAL NOTES.

[A cabinet has been arranged containing the Apparatus, Stains and Solutions necessary for taking and examining **Diphtheritic** Scrapings, for detecting the **Gonococcus** in discharge, for staining Sputum for **B. tuberculosis**, for collecting Blood for **Widal's Typhoid Reaction** for the **Gram** separation of Organisms, and for all other general clinical diagnoses.—B.M.J. ii./00,332; L. ii./00,1282.]

Anthrax.—*Bacillus Anthracis* is probably the oldest bacterium known, inasmuch as it was associated with splenic fever as long ago as 1849. It is responsible for 'malignant pustule' in man. If an animal die suspected of the disease the mode of examination is to cut off the ear and submit the blood from the same to bacteriological examination. The organism does not spore in the body of the animal, but if the air gain access, as in the case of an ordinary post mortem investigation, the organism spores rapidly and hence becomes a grave source of danger.

Chemistry of the Toxin.—P.J. ii./05,331.

The organism almost invariably occurs as long filaments, particularly in broth cultures (is non-motile). It grows on all the ordinary media both at room and body temperature, and produces in gelatin 'stab' cultures, typical 'inverted fir tree' appearance. By growing at 42°C a non-sporing form can be produced, which is the mode of attenuation for the immunisation of animals, as introduced by Pasteur. The spores retain their vitality and pathogenicity for years in the dry condition. Martin has shown that the organism produces an alkaloid which is the fever producer and an albumose which induces the coma. The malignant diseases which the organism produces in man have been satisfactorily treated by Sclavo's Serum (see *p.* 760), or by excision. If not diagnosed in time the organism may invade the blood stream, causing death, with symptoms of splenic fever, but the spleen is not so enlarged nor the bacilli so numerous in the organs.

Staining of the blood may be conducted by Gram's method (counterstaining with Eosin), also by Alkaline Methylene Blue.

Appendicitis.—Common intestinal parasites seem to be associated with this disease, *e.g.*, *Ascaris lumbricoides* and *Trichocephalus dispar*. Chauvel has pointed out that appendicitis appears to be the most prevalent among meat-eaters, and notably beef-eaters. It is, on the other hand, unknown amongst Arabs or the Chinese. In religious communities in Brittany where meat is never eater, appendicitis is unknown.

Bacteriology of.—In 70% of cases *B. Coli* was found.—B.M.J. ii./05,896. Full account.—L. i./05,549.

Beri-Beri.—This disease infests the Federated Malay States and parts of China. Up to the present its cause remains a mystery. A coccus had been isolated resembling *Staphylococcus pyogenes albus*, claimed to be motile. A bacillus also isolated from the blood in beri-beri is found in rice, and has been cultivated on rice water. It has also been suggested that the disease is due to arsenical poisoning. It has been found that the poorly nourished are more liable to contract it than those well fed. Europeans and Sikhs escape the disease entirely. The 'arsenical,' 'rice,' 'place,' and 'acute or sub-acute infectious disease' theories discussed.—B.M.J. ii./05, 1287. The bed bug is apparently not responsible for beri-beri.

As to treatment, Strychnine, Arsenic, and Silver Nitrate are in repute as soon as the muscular hyperæsthesia has subsided.—Sir P. Manson, 'Manual of Tropical Disease.'

Bacillus Botulinus.—This organism is found in a certain kind of meat poisoning designated 'botulismus.' An obligate anærobe, motile,—produces gas which splits up the medium in glucose agar stab cultures. Stains by Gram's method. Has terminal spores.

Bacteria of Poisoned Meat.—B.M.J. i./05,1257.

Bacillus Coli Communis. A normal inhabitant of the intestines, but becomes virulent in certain conditions. It increases the virulence of typhoid. Dried fæcal matter is the cause of widespread distribution in the intestinal tract. The Bacillus Coli is present in an infant a few hours after birth. For further characteristics *see* B. typhosus and Bacteriological Examination of Water. Savage divides types of B. coli into groups as indicators of excretal contamination.—L. i./05,284.

Seven cases of cystitis in children shown to be caused by invasion of this organism.—B.M.J.E. ii./04,65.

Bacillus Diphtheriæ (Klebs-Löffler Bacillus—The latest work leads to the opinion that this organism is of the nature of a Streptothrix). *Directions for collecting specimens.*—If a sterile swab is not at hand (with which is now supplied a convenient tongue depressor), a small piece of absorbent cotton wool (not medicated with an antiseptic) should be steamed, *e.g.*, at the mouth of a kettle, allowed to cool and rubbed over the membrane on the fauces of the patient and removed in a test tube or bottle which has been similarly sterilised. If possible a small portion of membrane should be detached in addition.

The resistance of the organism in dry condition and absence of light has been shown to persist for many months, an important point to recollect in disinfection of bed linen. Moist heat destroys the organism rapidly, *e.g* , a temperature of 60°C. Is also very sensitive to treatment by antiseptics. Nurses in charge of patients should be examined occasionally as the organism may be present without symptoms of illness and affection by such agency should be guarded against An injection of Antitoxin is a safeguard.

Films are prepared from the swabbing. Stain with alkaline methylene-blue or by Gram's method. Dry and mount in xylol balsam.

Recognition. — *B. diphtheriæ* may be distinguished from the other organisms which will probably be seen in large numbers by the following characteristics:—Irregularity in size and outline, straight or slightly curved, more or less clubbed at one or both ends, sometimes spindle shaped, or as curved wedges, occasionally irregularly segmented, rarely or never regular in outline. Parallel grouping and 'Chinese alphabet' characteristic. Stain irregularly. Show polar staining with methylene blue—this is the best stain to demonstrate the metachromatic granules—and Gram's method, *v.p.* 880. Cultivate on blood-serum—fine cream-coloured growth in sixteen to twenty hours, film from the same stain with methylene blue, Neisser's or Gram's method. Cultivations should in all cases be made on blood-serum or glycerin agar before the result of diagnosis can be positive. Further characteristics,—no spores, non-motile. Form differs with culture medium.

Neisser's original method of staining the organism:—

Stain ½ minute each (washing between with water) with

A. Methylene blue, 0·5 Gm.
Alcohol absolute, 10 Cc.
Distilled water, 475 Cc.
Glacial acetic acid, 25 Cc.

B. Bismarck brown, 1 Gm.
Distilled water, 500 Cc.

but altered in the length of time [which was 3 seconds with A. and 10 seconds with B. (B.M.J. i./03, 587) to 2 minutes each], advocated for examining direct from the swab.—B.M.J. ii./01, 758.

The use of eosine solution instead of B. above gives good results, working as follows:—

1. Make film in usual manner. 2. Stain with A. three minutes, and without washing pour on Gram's iodine solution 1 minute. 3. Wash in water and counterstain with eosin 5% aqueous solution 3 minutes, wash dry and mount. This method was claimed to be diagnostic, but other organisms *e.g.*, B. proteus Zenkeri, B. cyanogenus, and various organisms found in water, give similar results. The granules are stained blue, the rest of the bacillus is stained by the counterstain.

Pugh's Stain—Toludin Blue 1, Alchol 20, Distilled Water 1,000, Glacial Acetic Acid 50.—L. ii./05,80.

Loeffler-Neisser method advocated. — Stain with Loeffler's Alkaline Methylene Blue (*v.p.* 875) 3 to 4 seconds afterwards with B. above. Good results direct from the swab.—L. i./03,92.

Two reputed pseudo-varieties; one described by Löffler morphologically and in all respects similar to the Klebs-Löffler organism, but non-virulent, the other by Von Hoffman shortly after the latter—stains more regularly than the Klebs-Löffler bacillus, and usually showed no polar staining. "The existence of pseudo-varieties is not yet satisfactorily settled though recently the 'pseudo' bacilli are thought to be modified Klebs-Löffler, though perhaps not always, as more than one species having the same morphology may exist."—*Trans. Brit. Inst. Prevent. Med.*, First Series 1897.

Discussion on the nature of the pseudo-bacillus; some authorities still claim it to be a modification of B. diphtheriæ, others say it has no connection.—L. ii./03,332.

Pathogenicity of true Diphtheria Bacillus compared with pseudo forms.

Five Cc. of a glucose-broth culture two days old with pseudo-diphtheria bacilli are not pathogenic to guinea pigs, whereas ½ Cc. of a similar culture of true diphtheria bacilli usually kills in two days.

Glucose Litmus Broth cultures of true diphtheria bacilli show marked acidity in 24 hours, while those of the pseudo forms are stated not to evince this alteration of reaction. This method is useful for confirmation where no license for inoculation of animals is held.

B. Xerosis occurring in xerosis conjunctivæ differs in the fact that primary cultures from the eye on blood serum first appear in 36 hours. Sub-cultures do not show this difference. The organism is non-pathogenic to guinea pigs. The Koch-Weeks bacillus, a thin, non-motile organism decolourised by Gram's method, is found in a large number of cases of conjunctivitis. A diplo-bacillus has also been found which causes an extremely dangerous form of conjunctivitis, but it is amenable to treatment.

Sections of Membrane.—Stain for the diphtheria bacillus by Eosin-Gram-Weigert method:—

1. Stain 4 or 5 min. with eosin solution. 2. Wash well in water. 3. Pass through a little alcohol. 4. Stain with anilin-gentian-violet, 10 min. 5. Cover with Gram's iodine solution, 3 min. 6. Decolorise with anilin oil. 7. Clear with xylol and mount in xylol balsam.

Diphtheria organisms in throats of insane.—L.ii./05,465.

Diphtheroid organisms found in respiratory tracts in many cases of tabes dorsalis, but they cannot be proved to be the origin of the tabetic toxin.—L.i./06,954.

Roux's Stain for Bacteria.—Dahlia or Gentian Violet 0·5 Gm., Methyl Green 1·5 Gm., Distilled Water 200 Gm.

Dysentery.—*Amœba coli communis* is sometimes to be found in the stools or mucus.

There are said to be two types of dysentery, namely, the amœbic and bacillary.

There is, however, the mixed infection, namely that of the amœbic and bacillary. This constitutes a third type, and this point has not received the recognition to which it is entitled. The bacillus is probably in a resting state in the human body and breaks out into activity on occasion.

Shiga's Bacillus has the characteristic of elaborating alkali in its growth, whereas Flexner's Bacillus is an acid-producing organism.

With the acid-producing organism the blood examination gives a positive Widal reaction, whereas the alkali-generating one does not. Agglutination took place in one recorded series of experiments in the first instance with a 1 in 10 dilution in two hours. The bacilli of Shiga and Flexner are non-motile, non-sporing, and do not stain by Gram's method and grow on

all ordinary media. In cultural characters they resemble *B. coli communis*.

A modified Shiga's Bacillus, the same in fact, excepting the reaction on neutral milk.—I. Med. Gaz., 1904, *p.* 426.

Bacillus Dysenteriæ may be divided into four main groups, represented by:—

1. B. Dysenteriæ of Shiga and Kruse. This group ferments monosaccharides readily, and at times, after many days, maltose also. Does not ferment mannite (distinguishing from all others).
2. Bacillus Acillus "Y." Ferments monosaccharides and mannite generally within 24 hours. Maltose, and under special conditions, saccharose, may be fermented but not with ease.
3. Strong's Philippine Culture. Ferments monosaccharides with ease. Saccharose is fermented comparatively readily and at times maltose, but slowly.
4. Flexner's Manilla Cultures and Duval's "Baltimore" Culture. Ferments monosaccharides, mannite, maltose, saccharose and dextrin with ease, though saccharose less completely and slower than the others.

B. typhi abdominalis ferments monosaccharides, mannite, maltose, and dextrin, and is distinguished from (4.) by not fermenting Saccharose, and also by its motility.—B.M.J. i./05,56.

Unity of the types of Dysentery Bacilli discussed.—B.M.J. i./06,36.

Shiga's Bacillus isolated in 26 cases of dysentery in S. Africa out of 55 examined.—B.M.J. i./06,680; L. i./06,904.

For Antitoxins, see Section on Antitoxins.

Recent report on the bacteriology of summer diarrhœa in infants. The various types of *B. dysenteriæ* considered.—B.M.J. i./06,908.

Epidemic sporadic dysentery traced to Shiga's Bacillus.—B.M.J. i./06,1325.

Bacillus Equi.—A new microbe, pathogenic for rodents. In horse blood.—Klein, L. i./06,782.

Filaria.—The parasite is acquired by drinking infected and polluted water. In some countries a very large proportion of the population have the embryos of *Filaria nocturna* floating in their blood. Elephantiasis in all its phases is very marked in these localities. The worm is introduced under the skin in early stages by the proboscis of a type of Culex.

There are a number of forms of filaria, *e.g.*, *F. nocturna* (the best known variety said to be the embryonic form of *F. Bancrofti* found in the lymphatic system in man), *F. perstans*, *F. demarquaii*.

Eosinophilia in filarial disease. The eosinophile cells accumulate round the encapsuled fluke.—L.i./06,1623.

Micrococcus Gonorrhœæ.—Stain specimen with carbol-methylene blue or alkaline methylene blue 3 to 5 minutes, wash in water, dry and mount.

Recognition.—The cocci usually occur in pairs, occasionally in tetrads: in groups within the cells (Foulerton). They vary somewhat in size, and are somewhat ovoid, the opposed surfaces being flattened or even concave. Not stained by Gram

method, but by using an iodine solution three times the ordinary strength staining may be effected.

Jenner's Stain (*v.p.* 836) also gives excellent results.

Bacillus Influenzæ, Pfeiffer's Bacillus. A very small bacillus, non-motile. Does not stain by Gram's method, nor grow on ordinary media unless albumen be present. Grows best on blood agar, but dies out rapidly unless subcultured every few days. Present in sputum in cases of influenza. Stained by methylene blue the bacilli are very numerous in masses, but never seen in chains. (Rapidly decolourised by Gram's method.)

Micrococcus Catarrhalis, *Meningococcus* and *Gonococcus* compared in an epidemic simulating influenza.—B.M.J.ii./c5, 421.

Acid-production or failure to produce, in glucose, galactose, maltose, and saccharose media essential for diagnosis.

Bacillus Lepræ has morphology similar to *B. tuberculosis*, but usually occur more in clumps and are said to be tapered at the ends. Stain irregularly, and are more readily decolourised than *B. tuberculosis* by inorganic acids. No conclusive evidence of having been cultivated on artificial media. The minus-salt method probably resulted in a growth of *B. tuberculosis*, *c.f.* Leprolin in Antitoxin Section.

Malarial Parasites.—The mosquito theory of this disease was established by Ronald Ross, the winner of the 1902 Nobel prize. The *Culex pipiens* or common mosquito does not convey malaria, although there seems to be some doubt about this. It is the Spot-wing or *Anopheles maculipennis*, also belonging to the *Culicidæ*, which carries infection.

The female Culex has the palp much shorter than the proboscis, whereas that of the female Anopheles is almost the same length as the proboscis. The body of the Anopheles stands at an angle with the surface on which it is resting, whereas the body of Culex is almost always parallel with it.

The female is frequently found with its body 'blown out' with blood which it has imbibed. This Anopheles is common throughout the world. The males are harmless as far as blood sucking is concerned. The Midges (Chironomidæ) which 'dance' and swarm in the evenings are quite harmless. Important differences in venation and hairs on the wings enable one to distinguish between Culicidæ and Chironomidæ with certainty. The Anopheles goes through the stages of ovum, larva, and pupa; the mosquito lives in the water. Laveran, the discoverer of the parasite which is known as *Plasmodium* or *Hæmamæba malariæ*, divided it into the following phases:—1, spherical bodies; 2, flagellated; 3, crescents; 4, rosette forms.

(Some observers, contrary to Laveran, have been of opinion that the different types of malaria are due to different species of the organism.)

The whole life history of the Plasmodium will be found illustrated by some excellent models at the Natural History Museum, South Kensington. Briefly, in the tertian form the spore, which is freely swimming in the blood plasma, enters the corpuscle. It develops amœboid movement and then shows pigmentation owing to changes in the hæmoglobin. A nucleus is developed. The rosette form is the next change

owing to division of the Karyosomes. On breaking up, the spores are liberated into the blood, the spore emission being synchronous with the attacks of renewed fever.

There are two distinct cycles of existence, one in the human being (asexual) and the other (sexual) in the mosquito.

Benign Tertian.—This is mature in about 48 hours, the spore emission corresponding with the attacks of renewed fever.

Quartan.—This completes its cycle in 72 hours; the fever is, therefore, less severe than the tertian. In this the parasites are smaller, movements not so pronounced, and the pigment granules coarser. The rosette contains 6 to 12 spores, and the red corpuscles retain their colour.

In addition there is the **Æstivo-Autumnal** (malignant) variety of the fever, and frequently a mixed infection. In the tertian form the stippling (Schuffner's dots) of the parasite-containing corpuscle are easy of recognition. The cycle of change is difficult to follow; the young parasites are very small but active, and ring-forms in this type are very much in evidence. Crescents are present; they exist in the peripheral circulation, and are extremely resistent to quinine. These crescents are the male and female gametes; it is possible to observe the male changing into spherical bodies, which will flagellate whilst the others will not. They do not appear in the other forms of malaria.

In the tertian form of malaria one does not expect to find more than about 20 parasites per microscopic field. In the quartan one may find only two or three—they are often very difficult to find. In the latter the very young parasite often appears as a streak passing from one side of the erythrocyte to the other.

Films of blood smeared evenly with a very small quantity *s.a.*, dried in the air, not by aid of a flame, and fixed by immersing in alcohol and ether, equal parts, 10 minutes, may be stained with aqueous methylene blue and eosin, or with methylene blue alone, 5 minutes, or with a Hæmatoxylin Stain, or by Leishman's Stain, *see p.* 836. With Leishman's Stain fixing is not necessary. Consult Manson on 'Malarial Fever,' vol. viii., Allbutt's *System of Medicine*. Muir & Ritchie, 'Manual,' Hewlett, 'Manual of Bacteriology, 1902.'

Spirilla in the blood in a case simulating malarial fever.—B.M.J. i./05,532.

Micrococcus Melitensis in Mediterranean Fever.—B.M.J. i./06,313.

Peritonitis, Bacteriology of. Frequent presence of a *Staphylococcus albus*.—L. i./06,1250.

Bacillus Pestis (Bacillus of Bubonic Plague).

Specimens from the buboes show coccus-like forms. They were first found by Kitasato in 1894.—L. ii./98,428.

Culture—Yersin first described the cultural properties.

Morphology.—Short fat bacillus. On staining with weak aniline dye shows marked polar staining. Spores have not been demonstrated. Non-motile. Does not retain the stain when treated by Gram's method; grows well on usual media (? potato) both at room and body temperature. Does not liquefy gelatin. Occurs in chains when grown in fluid media.

forms typical stalactite growths in bouillon and in presence of butter fat, but must be kept undisturbed (Haffkine). Man is inoculated through the broken skin.

Recent work on the Bacillus.—B.M.J. ii./05,735.

Fraenkel's Pneumococcus.—1. Prepare films from 'rusty' portion of sputum. 2. Stain by Gram's method and counterstain with eosin half to one minute. Stain other films by carbol-fuchsin. Overstain (five minutes). Slightly decolorise with weak acetic acid. (For capsule.)

Recognition.—Diplococcus (free ends are often pointed—*Diplo. lanceolatus*) sometimes occurs in short chains of four to ten cocci. Has a capsule. Stains by Gram's method.

MacConkey's capsule stain:—Dahlia 0·5 Gm., methyl green (crystals) 1·5 Gm. Mix with 100 Cc. distilled water and add saturated alcoholic fuchsin solution 10 Cc. and water *q.s.* to 200 Cc. Allow to stand two weeks before use—in the dark. Stain 5 to 10 minutes. Wash, dry, and mount in xylol balsam.

May be identified by its forming capsules in gelatin at 37° C. in one day.—B.M.J.i./04,659; American Research on.—B.M.J. ii./05,894.

Pneumococcic Peritonitis in children, 15 cases reported.—L.i./06,1591.

Friedländer's Pneumobacillus.—Present in only small proportion of cases of pneumonia. Is not stained by Gram's method, but stains well by carbol-fuchsin.

Recognition.—A bacillus varying considerably in length; usually short, with rounded ends. Has a capsule. Is easily cultivated on all ordinary media.

Relapsing Fever is associated with the presence of **Spirochæta Obermeieri** in the blood. In cases of relapsing fever terminating fatally the blood is frequently found to be teeming with the organisms. The corpuscles with the $\frac{1}{12}$ inch oil immersion lens frequently appear to have slender spiral filaments attached to them, causing a rippling movement of the blood, which persists for several hours when examined in the fresh condition.

This Spirochete has, as yet, not been cultivated, but it is suggested as a stage in the life history of the trypanosoma, and hence does not belong to the vegetable kingdom. Trypanosomes have been successfully cultivated in a condensation fluid, which arises from a special medium prepared from defibrinated rabbit's blood and agar-agar; there may be hopes of growing Spirochæta on a similar medium.

The ordinary Spirilla which may be cultivated on artificial media, are shorter and thicker than those observed in blood; these are extremely long and flexible, generally tapered or pointed at the ends. Flagellæ have been demonstrated on all cultivated Spirilla. These, however, have not been shown in the longer form or Spirochæta, such as the *Sp. Obermeieri* and *Sp. Pallida*, and possibly the motility of these organisms is not by means of flagella, but is a contraction of their protoplasm.

Assumed spread of infection through mosquitos.—B.M.J. i./06,1400.

Ringworm Fungi. Rapid Clinical Method of Search :-

(1) Soak the hairs in Potash Solution 10 minutes.
(2) Wash in water to free from alkali.
(3) Mount in Glycerin or Glycerin Jelly.
(4) Ring with gold size.

For permanent stained sections :—

(1) Soak the hair in Ether 5 to 10 minutes.
(2) Stain with Anilin Gentian Violet (*q.v.*) for 1 hour (Malcolm Morris formula : 5% Alcoholic Gentian Violet 1, Anilin Water 3).
(3) Absorb excess of stain.
(4) Treat with Gram's Iodine Solution 2 minutes, wash in water. Decolourise with acidified Anilin Oil (Anilin Oil 10, Nitric Acid 1) for 15 to 20 minutes. Treat with Anilin Oil 1 minute, clarify in Xylol, and mount in Balsam.

The organism of *Favus* is *Achorion Schönleinii*, those of *Tinea tonsurans* and *T. circinata* are *Microsporon Audouini*, *Trichophyton Megalosporon ectothrix* and *endothrix*, that of *Tinea* (*Pityriasis*) *versicolor* is *Microsporon Furfur*.

Cultivation of Ringworm Fungi is possible on all ordinary media, but the addition of Glucose or Maltose is most favourable.

Seborrhœa.—Sabouraud has isolated a microbacillus whose favourite habitat is the upper portion of the hair follicle—this causes the output of increased amount of sebum.—M. P. June 8, 1904, p. 618.

Skin, Tropical diseases of the.—MacLeod, B. M. J. ii./05, 1266.

Pinta, a disease caused by a fungus, producing discolourations on uncovered parts of the skin.—B. M. J. ii./05, 1270.

Pityriasis Versicolor, due to fungus growth under the skin, common in the tropics.—B. M. J. ii./05, 1271.

Pellagra.—One of the chief plagues in Italy. *Aspergillus fumigatus* and *A. flavescens* said to be the cause. Some say it is hereditary.—B. M. J. ii. /05, 1273.

Yaws (*Frambœsia Tropica*) Treatment.—Sodium Bicarbonate in 1 drachm doses, together with Copper Sulphate locally.—B. M. J. ii./05, 1275.

An exceedingly contagious disease. Potassium Iodide in.—B. M. J. ii./05, 1276.

Dhobie Itch.—Severe prurigo of the thighs is due to various Fungi.

Tinea Circinata.—The Fungi of this are distinct from those of dhobie itch, though all belong to Trichophytons.—B. M. J. ii./05, 1278.

Parangi.—(Allied to syphilis?) Spirochetes found.—B. M. J. ii./05, 1280.

Sprue and Hill Diarrhœa.—Features are sore tongue, stomatitis, peculiar form of diarrhœa, due to varieties of bacteria. Milk diet recommended.—B. M. J. ii./05, 1281.

Syphilis.—Spirochæta Pallida.

Giemsa's Stain.—Dissolve Azur II.-Eosin 3 Gm. and Azur II. 0·8 Gm. (previously well dried in exsiccator before weighing, and powdered as finely as possible) in 250 Gm. Glycerin (chem. pur.) without heat, add Methyl Alcohol 250 Gm. Shake well, allow to stand at room temperature 24 hours and filter. It is convenient to keep a little of the stain thus made

in a drop-bottle and add from this 1 or 2 drops of the stain to every Cc. of water in the staining bath. Staining of films or 'smears,' previously fixed in alcohol 15 minutes, is allowed to proceed for 15 to 60 minutes (Giemsa) in a shallow dish (some workers favour much longer), wash in water, dry and mount. Over-stained preparations should be treated with water to remove excess.

The material called Azur II.-Eosin is composed of Methylene Azur and Methylene Blue in equal parts and Eosin chemically combined in a manner not stated by Giemsa in his papers.

This stain imparts to the spirochete a distinctly reddish violet tinge, similar to that of the neighbouring leucocyte nuclei (the Romanowsky chromatin stain), whilst the bacteria in the preparation come out blue.—B.M.J. i./05,1263.

The use of glycerin as solvent is an obvious advantage in the direction of keeping qualities. Giemsa claims the stain as specific for the Spirochæta Pallida.—D.M.W., June, 1905, No. 26, p. 1026.

Schaudinn and Hoffman's results confirmed,—the organism was found in several involution forms. Giemsa's stain employed.—L. ii./05,962.

Latest results in staining blood for the spirochete.—L. i./06, 663,746.

Staining tissues to demonstrate the spirochete.—B.M.J.E. i./06,36.

Spirochætæ found in Syphilis. Leishman's Stain used.—L. ii./05,522.

Spirochæta Pallida found in several cases of secondary syphilis.—B.M.J.E.ii./05,96.

Cytorrhyctes Luis (Siegel) may be one stage in the development of the spirochæta.—B.MJ.i./06,258.

Syphilis transmitted to an ape. Spirochætæ found on the 37th day after inoculation.—B.M.J.i./06,607.

Comparison with other Spirochetes and some Protozoa. Jackson Clarke.—B.M.J. i./06,1274.

Trypanosoma.—Morphologically, a long-shaped protozoon containing a large nucleus centrally and a vacuole or contractile vessel at the larger end.

The single flagellum proceeds from a small mass of chromatin at the anterior end. This flagellum forms the edge of undulating membrane which is observable from end to end of the organism, and continues in the same direction for some length as a free tail. It measures 18·26 m. by 2 to 2·5 m.

Analogy has been drawn with certain other flagellates—notably trichomonas, englena and herpetomonas. Trichomonas moves both backwards and forwards. Englena and herpetomonas move only forwards, and the trypanosoma backwards—by the aid of the membrane. At the spot slightly behind the vacuole there are some patches of pigment—the so-called eye spots centrosome or micronucleus.

Trypanosoma reproduces itself by longitudinal division or fission—in addition there is sometimes transverse fission—and formation of rosettes by multiple division. Before the fission there is a division of the centrosome, followed by division of the flagellum, nucleus and the protoplasm—these dividing forms are not easy to find in the blood.

The organism may be found in large numbers in the blood

in every case of sleeping sickness, as also in the lymphatic glands and in the advanced disease in the cerebro spinal fluid.

There is no great reduction in the number of red corpuscles. The hæmoglobin is also not decreased.—L. i./06,227.

Staining is best conducted with Leishman's stain; some beautiful specimens can be produced with this. It may well be employed by first pouring on to the film and allowing to stain half a minute, then add twice the volume of distilled water and allow to stain further half an hour. Wash in distilled water and dry in customary manner.

Other methods of staining are with Thionin Blue, Methylene Blue, and Borrel's Blue, *q.v.*

Manson recommends the examination of the blood when the temperature is high; it is well to centifrugalise as the trypanosomes accumulate in the leucocyte layer above the red corpuscles.

Classification of some of the trypanosomes found up to the present:—*T. Evansi* (1880), causing "surra" in India, *T. Elmastiania* (1901), causing mal de caderas in South America. *T. Brucei*, found in cases of tsetse fly disease or nagana, in Zululand, Bruce, 1894. *T. Rougeti* (1896), the parasite of dourine or mal du coit, occurring in South Europe, North Africa, and other parts. *T. Lewisi*, non-pathogenic, found in rats. On injecting into other animals is removed by phagocytosis. *T. Nepveui* (1890), found in man in Algeria. Was called *T. Gambiense* by Dutton, but this may be objected to as the parasite may not be confined to Gambia. Manson called it *T. Hominis*. This is the only one found in man. *T. Castellani* (November 1902), found in Uganda by Castellani, occurs in the cerebro-spinal fluid in cases of sleeping sickness. It is closely allied to *T. Gambiense*. The tsetse fly, *Glossina palpalis*, is common in the Upper Congo and Uganda; *Glossina morsitans*, as shown by Bruce in 1894, being responsible for nagana, or tsetse fly disease in animals.

The anatomical changes effected by the parasite, or a poison produced by it are general emaciation, enlargement of the lymphatic glands throughout the body, particularly that of the central nervous system, and changes in the brain.

As long ago as 1857 Livingstone correctly surmised that "a poison in the blood, the germ of which enters when the proboscis is inserted to draw blood—this poison germ contained in a bulb at the root of the proboscis seems capable, though minute in quantity, of reproducing itself."

Bruce and Nabarro were sent out to Uganda by the British Government, and the experiments they conducted with the tsetse flies collected at Entebbe and allowed to bite monkeys after being fed on cases of sleeping sickness are stated to prove:—(1) That the trypanosomes of sleeping sickness are transmitted from the sick to the healthy by *Glossina palpalis*. (2) That the fly carries a parasite much in the same way as the vaccinating needle carries the infection of vaccine from child to child. Sambon, however, gives some searching criticisms on these results.

Trypanosoma has been cultivated in the condensed moisture which arises from a blood agar medium.

Latest views on Trypanosomes (International Medical Congress), B.M.J. i./06,1287.

Laveran's Method of Staining Trypanosoma.

Prepare thin blood films, and fix in absolute alcohol 5 to 10 minutes. The following are required:—

(1) *Solution.*—Methylene Blue and Silver Oxide (Borrel's Blue). Prepare "some" Silver Oxide freshly by means of Silver Nitrate and Sodium Hydroxide. Wash the precipitate with distilled water thoroughly, and add to it a saturated solution of medicinal Methylene Blue. Allow to remain for a fortnight, occasionally shaking.

(2) Aqueous Solution of Eosin 1 per 1,000.

(3) Solution of Tannin 5%, or, better, a solution of Tannin Orange, obtainable commercially.

Mix just before use: No. 1 Solution 1 Cc., No 2 Solution 4 Cc., Distilled Water 6 Cc.

Stain in a flat dish, film downwards, for 5 to 20 minutes—5 to 10 minutes is enough in most cases. Wash in water and treat with tannin for a few minutes. Wash in water and then in distilled water. If precipitate found on the preparation wash in Clove Oil and brush off with Xylol.

Cultivation of Trypanosoma out of the Leishman-Donovan body.—L. i./05,16.

Bacillus Tuberculosis. (Now viewed as a member of the Streptothrix group.) Ziehl-Neelsen's method: Sputum and sections.—1. Prepare film from caseous particle of sputum or a section ready for staining, and fix by usual methods. 2. Boil filtered carbol-fuchsin in a test-tube and cover specimens with it entirely; stain films 5 mins., sections 10 mins. (**Carbol-Fuchsin Solution**, Neelsen's Solution, is prepared by mixing Concentrated Alcoholic Fuchsin Solution 1 with 5% Carbolic Acid Solution 9, slightly warmed.) 3. Wash well in water. 4. Decolorise almost completely by immersing in 25% sulphuric acid. 5. Wash well in water. 6. Counter-stain with **Loeffler's alkaline methylene blue**—sputum, 1 to 2 mins.; sections, 3 to 4 mins. This stain is prepared by mixing Concentrated Alcoholic Methylene blue solution 142 mins. with 1 ounce of a 1 in 10,000 solution of Caustic Potash. A few drops of 10% **Tannin Solution** added to every 100 Cc. of Loeffler's Solution is found to improve the stain (Pollard). **Carbolised Methylene Blue (Kühne)** is also employed.—Dissolve Methylene Blue 1, as much as possible in Alcohol 90% 7, and add Phenol Solution 5% 70, allow to settle and decant. 7. Wash, dry, and mount in Xylol Balsam (sputum). 8. If section, dehydrate with alcohol, clarify with xylol, and mount in xylol balsam. If dehydrated with anilin oil instead of alcohol a clearer preparation is produced.

Technique for staining B. tuberculosis —L. ii./05,600.

Fuchsin-Anilin Green Method for staining B. tuberculosis.

Solution A. Fuchsin 10, Absolute Alcohol 100.
,, B. Strong Ammonia Solution 3, Water 100.
,, C. Alcohol 50, Water 30, Nitric Acid 20, Anilin Green *q.s.* to saturate.

Add one part of A to 10 of B. Warm until vapour arises, immerse 1 minute, wash with water, then immerse in C 40 seconds. Wash off thoroughly. Bacilli red on pale green ground.

Recognition.—Delicate, straight, or more usually slightly curved rods. When stained, usually beaded in appearance.

The length of the organism is commonly said to be about one-quarter to one-half the diameter of a red blood-corpuscle, but it varies considerably. Involution and branching forms occasionally met with.

Tubercle Bacilli contained in sputum retain their vitality, even when the sputum dries up for a considerable time.

Cultural Characters. Was first grown on blood serum by Koch, but will not grow without addition of glycerin to the ordinary media. Requires temperature of 37°C. Dry wrinkled growth somewhat like a lichen, on glycerin agar in three weeks. Cultures, especially in glycerinated broth, have fruity odour.

To obtain a pure culture of the organism from tubercular material it is necessary to inoculate guinea pigs with same, and after a lapse of four to six weeks cultures are made from enlarged glands direct on to blood serum or glycerin potato. Glycerin agar is not recommended for use direct *post mortem*, but the organism flourishes on this on sub-culture.

Gabbett's Stain.—(i.) *Fuchsin Solution.* Fuchsin 1, Absolute Alcohol 10, Phenol Solution (5%) 100. (ii.) *Methylene Blue Solution.* Methylene Blue 2, Pure Sulphuric Acid 25, Water 75. Stain 2 or 3 minutes with (i.) warm, then with (ii.) 1 or 2 mins. Wash, dry and mount in Xylol Balsam. The decolorising and contrast staining are done in one process.

Gibbes' Double Stain (Schenk's method of preparing). —Add Fuchsin 4 and Methylene Blue 2, in small portions at a time to a solution of Anilin Oil 6 in Absolute Alcohol 30; when completely dissolved add Water 30. Requires careful making.

Urine.—At least six films should be prepared. The specimen is centrifugalised, the supernatant liquor is poured off, and the sediment is washed two or three times by shaking up with sterile water, centrifugalising on each occasion. Stain as for sputum, but wash after 5 above in absolute alcohol. In taking sample wash glans penis, using a sterilised catheter if necessary, to ensure not getting any Smegma bacilli—the latter resist acids when decolorising, but differ from *Bacillus tuberculosis* as follows:—They are said to be slightly shorter and straighter, and to be decolorised with absolute alcohol.

Milk.—The staining for B. tuberculosis is similar to that used for urine. Both the cream and the sediment must be carefully searched on centrifugalising. It is well to soak the slides at the outset after drying and fixing in ether for a minute or two to remove the fat. *Negative results in all instances are not necessarily conclusive of absence of infection.* Injection of suspected animals is then necessary for confirmation.

Bacillus Typhosus.—Typhoid Fever.

Zupink divides bacteria into groups—the organisms of one group will be clumped by the serum from an animal inoculated with any one of them, *e.g.*, all acid-resisting bacilli are agglutinated by serum resulting from injecting B. tuberculosis. The fact that the agglutinating power of a serum may be exhausted by additions of the bacilli on which it acts proves that the power is in reality due to a definite substance. —Bosanquet.

Widal's Reaction.—Collect sample of blood in a small capillary pipette, and seal the ends, that nearest the blood

being closed first. By pricking the lobe of the ear or the finger the blood will run into the tube by capillarity. The serum is allowed to separate, or the tube is centrifugalised to cause as complete a separation as possible of corpuscles which may mask a reaction. The serum is blown out on to the corner of a slide and a platinum loopful is mixed with 9 loopfuls of normal saline solution, and one loopful of this 1 in 10 dilution is mixed with 2 loopfuls of typhoid broth, not more than 24 hours old, preferably filtered through ordinary filter paper. This 1 in 30 dilution is now examined as a hanging drop. A control experiment must be conducted in addition.

Positive Reaction.—Complete: Clumping of organisms and cessation of movement (as a rule in under 30 minutes, or may be instantaneous). Partial reaction: Sluggish movement, providing the control is actively motile. Negative reaction: No alteration in 1 hour. Dilutions 1 in 100 should give same results in 50 minutes; if the time exceeds this the diagnosis is doubtful.

The reaction may also be performed in similar dilutions in sealed capillary pipettes (Wright). This constitutes the macroscopic method of applying Widal's Reaction.

Wright's improvements in the technique.—L. ii./03,214.

The urine and other excretions of typhoid patients also possess agglutinative power. It is stated that if the serum be heated to 80° C. for one hour its agglutinative power is lost.

Notes of Caution in Applying.—The broth itself or a control with normal serum should first be examined to see that the organisms are freely motile and show no pseudo clumps, as clumps are sometimes present in the broth before the addition of the blood. The serum of persons having previously had typhoid may react even years after. This may cause confusion where a typhoid diagnosis had not been given. Again, if only slightly diluted, *e.g.*, 1 in 10, normal serum frequently 'clumps,' which is not the case on further dilution,—1 in 30 or 50 is safest. Too *great* a dilution may obscure. The blood of *all* cases does not react, case may be too early (generally obtained about end of first week). Cases recorded where reaction intermits, absent one day, present next, and again recurs, and also a few described where there was no reaction throughout the disease, but these are fortunately very rare.—Clinical Journal, May 2, 1900.

A special culture should always be at hand—one known to re-act, as occasionally laboratory cultures do not respond.

The reaction is not considered positive (at Guy's Hospital) unless clumping and immobility occur with a 1 in 200 dilution within half an hour.—L. i./03,363.

On Widal's test in the typhoid of childhood.—B.M.J. ii./01,596.

Widal's test gave accurate results in 64% of cases. Failed in a few.—B.M.J. i./03,546; B.M.J. ii./01,1084.

A pathogenic organism other than *B. typhi abdominalis* may give the reaction, *e.g.*, according to Durham, *Gärtner's bacillus* when mixed with typhoid broth may react. If one drop of blood serum of a patient under infection with this organism (from eating unsound meat) be mixed with 9 of typhoid broth, a positive result may be obtained, but 1 in 100 dilution is negative.—B.M.J. i./98,1797.

As to the nature and causes of the reaction, the bacilli produce in the spleen and elsewhere toxins which, by their action on the tissues, particularly on the blood, cause certain changes, apparently chemical in nature, giving to the blood and certain fluids this property of causing clumping and cessation of movement when mixed with the typhoid bacilli. —Clinical Journal, May 2, 1900.

Typhoid Agglutometer for early diagnosis of typhoid fever consists of a permanent suspension of dead typhoid baccilli, with apparatus for making a Widal test directly from the blood of the patient without the aid of a microscope. No. 1 is for one test; No. 2 for 15 to 30.—L.i./05,1505.

Recognition.—*B. typhi abdominalis* is about thrice as long as broad (filamentous forms occasionally seen) with rounded ends, actively motile—flagella stained by McCrorie's, Van Ermengem's, or Pitfield's methods, are long and wavy, 12 to 16 in number, though films usually do not show more than 8 or 10, a large number of detached flagella being also visible. No indol production.

A permanent slightly acid production in litmus milk distinguishes from *Gärtner's Bacillus* which produces marked alkalinity in all cultures (milk is not coagulated by either). Neither this, *Gärtner's Bacillus* nor *B. coli*, liquefy gelatin.

Growth on potato translucent (that of *B. coli* and *Gärtner's Bacillus* is brown and moist); in glucose-gelatin no gas formation (differences from *B. coli*, of which at least 15 species have been described, and *Gärtner's Bacillus*). The Indol test is not always specific with strains of true *B. coli*. On violet media.—B.M.J. 1./04,17.

Caffein enrichment method for separating *B. typhosus* from *B. coli*.—L. ii./05, 464. *B. typhosus* is said not to grow in a medium containing 0.01% Arsenious Acid, whereas *B. coli* will grow in a medium containing 1·5% of same.

Methods of diagnosis in vogue discussed. Endo's medium favoured.—B.M.J. i./06,939.

Flagella Stains.

McCrorie's Stains.—Solution A. Night blue 1 in alcohol, absolute 20, alum 1 in water 20, Tannic acid 1 in water 20. Mix and filter at once. Solution B. Anilin Fuchsin. To 100 Cc. of saturated Anilin Water, add 10 Cc. of absolute alcohol and 1 Gm. of Fuchsin, or Carbol-Fuchsin diluted may be employed.

Van Ermengem's Stains.—A. 1% Osmic Acid Solution 100, Tannin 18, water 45. B. Silver Nitrate Solution 0·25 to 0·5%. C. Gallic Acid 1, Tannin 0·6, Sodium Acetate fused 3·3%, Water 76.

Pitfield's Method.—Solution A. Tannin 1 Gm., Water 10 Cc. Do not filter. Solution B. Saturated aqueous solution of alum 10 Cc., saturated alcoholic Gentian Violet Solution, 1 Cc. Filter and keep in a stoppered bottle. Fuchsin will answer the same purpose as Gentian Violet. Equal parts of A and B mixed, heated to nearly boiling and employed to stain 1 to 3 minutes, wash in water, dry and mount.

Gärtner's bacillus thought to be a modification of *B. coli*, and the above differences not always constant, and even the

agglutination test between *B. typhi abdominalis* and *B. coli* not always reliable. Stab and shake cultures on agar containing 0·3% glucose, stained with neutral red safranine distinguish, *B. coli* discharging it, probably because it is a strong reducing agent, producing a saffron tint with fluorescence in 12 to 24 hours, but *B. typhi abdominalis* is without action on the red tint.—L. i./01,613; P.J. i./01,391.

B. coli communis is a normal and advantageous inhabitant of the intestine, but may become responsible for an attack of inflammation of the bowel or epidemics of food poisoning. —P.J. ii./03,740.

"Krystall Violet" and neutral red, advocated for distinguishing colonies of *B. coli* (coloured red) from those of *B. typhi abdominalis* (also *B. enteritidis Gaertner*, and others), coloured blue to purple. Medium contains Sodium taurocholate to inhibit growth of nearly all but intestinal bacteria. Lactose is another essential component of the medium, as *B. coli* and congeners decompose it with gas formation.—B.M.J. i./02,1473.

Urotropin 0·1, 0·5 and 1% in broth, differentiates *B. typhosus* and *B. coli*.—Dudgeon, B.M.J. i./06,143.

B. typhosus added to "raw water" is killed by protozoa. The organism lives much longer when added to distilled or sterile water.—L, i./06,693.

Conradi has evolved a method of early diagnosis of typhoid fever. Researches demonstrated necessity of keeping the blood in a fluid condition, so as to avoid the disinfectant action of those substances which become active on coagulation. Bile is employed for this purpose; in addition, the medium contains 10% peptone and 10% glycerin. The blood from lobe of the ear is drawn into a pipette containing a little bile and mixed with two to three Cc. of the Peptone-glycerin-bile medium in the proportion: blood 1, medium 3. Incubate at 37°C. for 10 to 16 hours and make cultures on agar plates according to the Drigalski-Conradi formula. Diagnosis can be effected by this method in 26 to 32 hours, and it is applicable as soon as the patient exhibits a febrile temperature.—B.M.J. i./06,339.

"Diazo" Test for Typhoid Fever (Ehrlich).

A. Hydrochloric (or Nitric) Acid 10, Water to 200, Sulphanilic Acid *q.s.* to saturate.

B. Sodium Nitrite 1, Water to 200.

For use, mix 200 of A with 5 of B (this must be done immediately before use), add to an equal volume of urine and render alkaline with strong ammonia.

The reaction is indicated by a red coloration; on shaking, a characteristic pink froth appears. After 12 to 36 hours a deposit is formed, the upper part being green or black.

This test is inserted for reference only—it is not regarded as specific for typhoid fever. Drugs such as thymol, salol, sodium sulphocarbolate, guaiacol do not, however, produce it. —M. Arch, 1905, 363.

Explanation.—Also gives a positive reaction in tuberculosis and measles. Diazosulphobenzol is formed by the interaction of nitrous acid and sulphanilic acids which unites with certain aromatic bodies occasionally present in urine forming aniline colours.—B M.J. i. /05,984.

B. Enteritidis Sporogenes.—An anaërobic organism staining by Gram's method, spores only on blood serum (?), which it liquefies. Note on, found in the dejecta of the sufferers in the epidemic of diarrhœa at Bartholomew's Hospital in 1895. Detection of in water supplies.—P.J. i./02,25. *Vide* also *p.* 888.

Said to be the cause of infantile diarrhœa. Growth in milk produces characteristic separation of stringy curd and excessive whey. Extremely pathogenic to guinea pigs, from which pure cultures obtainable from the œdema fluid by growing on blood serum under anaerobic condition, *c.f.* Water Examination.

Yellow Fever.—Infection of this disease is probably carried by *Stegomyia fasciata*. The specific germ of yellow fever, *Filaria Bancrofti*, has its permanent host in the mosquito, undergoing sexual reproduction in the human blood—the exact reverse of what takes place in malaria—in which man is the permanent host, the germ of yellow fever must, therefore, be searched for in the mosquito. A bacillus, designated the *Bacillus icteroides*, has been found in the disease, but this is not the important feature.

The infected insect lives a long time, and it can transfer the fever as long as it lives—59 days has been recorded. It hibernates in the United States; but, if the infected adult hibernates, either a very large proportion of them die or else the infecting parasite must generally die in the mosquito—the first seems probable.

The cycle of the yellow fever parasite in the mosquito before it is communicable to man is about 14 days. *C.f.* also B.M.J.i./05,552.

Gram's Method of differentiating Organisms in Film Preparations:—

1. Anilin-Gentian-Violet, 3—5 mins. 2. Without washing, Gram's solution ½ to 1 min. 3. Pour off Gram's solution, wash in water, rinse with alcohol, until no further colour comes away. 4. Wash in water. Dry. Mount in xylol balsam. 4a. If pus, after washing in water (4), counter-stain with Eosin 1 min. Wash. Dry. Mount.

Gram-Eosin Method for Sections.—1. Place a little alcohol on section ½ min. 2. Cover with filtered Anilin-Gentian-Violet 10 mins. 3. Gram's solution, 3 mins. 4. Decolorise in Alcohol. Wash in water. 5. Stain with Eosin 1—2 mins. Wash in water. 6. Dehydrate with Alcohol. 7. Clear with Xylol, mount in Xylol Balsam.

Eosin - Gram - Weigert Method.—Eosin (5% aqueous) 5 to 10 minutes. Wash in water. Anilin-Gentian-Violet 10 minutes without washing. Gram's iodine solution, 1 minutes. Wash in water. Blot, dehydrate, and decolorise in anilin oil until pink colour returns. Clarify in Xylol and mount in Xylol Balsam. This method is preferable to the Gram eosin method, as anilin oil is more gentle in decolorising action than the alcohol used in the latter.

A simple stain for sections is:—

Fleming's Triple Stain, Modified. (A true triple strain).—Fix sections in Acetic Alcohol (Glacial Acetic Acid 1 Alcohol Absolute 2), cut and mount, stain 1 hour in saturated Aqueous Safranin Solution, wash in water. stain ½-hour in

saturated Aqueous Methyl Violet. Wash in water and wipe all but section dry, flood the slide with solution; to 20 Cc. of Acetone add drop by drop saturated Aqueous Solution of Orange G. until flocculent precipitate is just dissolved, filter. Flood again with the stain when faint brownish pink, pour off the Orange Acetone, wash in Acetone a few seconds and then repeatedly in Xylol. Finally mount in Xylol Balsam.—L. i./06,221.

Carbol-Thionin Blue.—Thionin Blue, 0·65 Gm.; Absolute Alcohol, 3·5 Cc.; Phenol Solution, 5%, 39 Cc.

Gram's solution has the formula:—Iodine, 1 Gm.; Potassium Iodide, 2 Gm.; Water, 300 Cc.

NOTE.—Anilin-Gentian-Violet is prepared by adding 1 part of a concentrated alcoholic solution of the dye to 9 parts of a filtered saturated solution of anilin oil in water (solubility about 1 in 30). **Carbol-Gentian-violet** is the same, with 5% phenol solution in place of anilin water.

List of some pathogenic and common non-pathogenic organisms stained and not stained by Gram's method:—

A. STAINED.	B. NOT STAINED.
Staphylococcus, all varieties.	Gonococcus.
Streptococcus pyogenes.	Diplococcus intracellularis meningitidis (Weichselbaum).
Micrococcus tetragenes.	Bacillus mallei.
Fraenkel's pneumococcus.	,, typhi abdominalis.
Bacillus anthracis.	,, coli communis.
,, botulinus.	,, dysenteriæ.
,, diphtheriæ (Klebs-Löffler).	,, enteritidis (Gärtner).
,, enteritidis (Klein)	,, pestis.
,, pseudo-diphtheriæ.	,, pyocyaneus.
,, xerosis.	,, influenzæ.
,, smegmatis.	,, Friedländer's Pneumo-
,, tuberculosis.	,, of Malignant œdema.
,, lepræ.	,, of Symptomatic anthrax (Charbon).
,, tetani.	,, prodigiosus.
Sarcinæ, all varieties.	,, proteus *var.*
Yeasts (Blastomycetes).	,, fluorescens liq. and non-liq.
Ringworm Fungi.	Spirillum choleræ Asiatic.
Streptothrix of Actinomycosis	,, Metchinikovi.
,, of Madura disease	,, Finkler and Prior

Semen Test.—The presence of semen may be detected by evaporating a drop of the liquid from the moistened stains, fixing it by a flame and staining with eosin and methyl green. At the base of the head of the spermatozoon is a hemispherical portion which stains green, while the anterior part and tail stain red. Some prefer the use of methyl green alone. Ehrlich's Hæmatoxylin (stain 5 minutes, wash in distilled water, then in tap water until blue, and counterstain with Eosin solution, 2 or 3 minutes), also gives good results.

Preparation of Sections before Staining.—Small pieces of the tissue to be examined for organisms may first be 'fixed'—*i.e*, made permanent by soaking in a

saturated solution of corrosive sublimate made with normal saline, or in the platino-aceto-osmic mixture of Hermann, or in one of numerous mixtures of this kind, for twelve, twenty-four, or more hours, according to the size of the tissue.

They are then hardened by immersing in alcohol, passing through gradually increasing strengths—*e.g.*, for twenty-four hours respectively in 30, 60, 90%, and finally into absolute alcohol. (In urgent cases the tissue, if small, may often be transferred direct from the "fixer" to the absolute alcohol.) It is then placed in a mixture of equal parts of absolute alcohol and chloroform for twenty-four hours. Fro this it is removed to chloroform for four hours, thence to a mixture of paraffin (melting at 46·8° C.) and chloroform in a wide-mouthed stoppered bottle, and kept at 56° C. for four hours in an oven which can be maintained at this temperature. The tissue is then transferred to paraffin, and kept at the same temperature for twelve to sixteen hours. It is finally poured into a little box, *secundum artem*, covered with paraffin, allowed to set, and cut with a good microtome.

Tissues are also hardened with formalin, and may be imbedded in gum acacia, celloidin, etc.—but for bacteriological work the paraffin treatment is the one most recommended. The formalin and gum method is useful when the diagnosis is urgent.

An accessory for freezing microtomes.—L.i./05,1505.

Formalin Preservative Solution.—Formalin (40%) 78, Potassium Acetate 3, Potassium Nitrate 1, Glycerin 40, Water 140.

This solution has the advantage of retaining the colour of pathological specimens.

Farrant's Mounting Medium.—Gum Acacia, best small, 32 ozs., wash well with 6 ozs. of water in two or three lots and dissolve in 40 ozs. of boiling water with constant stirring. Strain through muslin and add Arsenious Acid 1 drachm in Glycerin 40 ozs., heat gently to clarify.

Asphalt Solution for mounting purposes. Asphalt 2, Chloroform 3.

PREPARATION OF CULTURE-MEDIA.

Here may be mentioned the formulæ for preparing the commoner sterile bacteriological nutrient media.

Nutrient Broth.—The method preferable is:—Beef (or horse, &c., flesh) 450 Gm. freed from fat and minced, is extracted for twenty-four hours with cold water 1,000 Cc. The albumin is coagulated by heat and strained off. The resulting extract is boiled ten minutes with sodium chloride 5 Gm., and peptone (in powder) 10 Gm., with occasional shaking. Make faintly alkaline with dilute sodium carbonate solution, using litmus as indicator, and filter.

For filtering all media use a special tough thin French-grey paper. All media are used either neutral or faintly alkaline.

In place of above, a good meat extract may be used as the starting-point. Boil 5 Gm. of the extract, peptone 10 Gm., sodium chloride 5 Gm., water 1,000 Cc., and finish as above. The broth thus prepared may be run into specially cleaned test-tubes, about 5 Cc. into each. These are now plugged and sterilised at 100° C. for a quarter of an hour on three

successive days, or the broth may be converted into other nutrient media.

Standardisation.—Broth thus, and the gelatin and agar media, made from it are acid to phenolphthalein, but are frequently neutral or even alkaline to litmus—this latter not being sensitive to many of the weak organic acids present in the meat extract. The medium is, therefore, standardised with $\frac{N}{10}$ soda in the presence of phenolphthalein. The re-action of a medium is usually expressed by the number of Cc. of normal alkali required to be added to 1 litre of medium to render it exactly neutral to phenolphthalein, *e.g.*, '+ 10' indicates that 10 Cc. of N soda have to be added to neutralise it. *This reaction has been found best for general bacterial growth, and is the standard employed.* The rule for standardising, therefore, is to subtract 10 from the number of Cc. of normal soda that must be added per litre; for example, if 10 Cc. of a medium require 1·2 Cc. of $\frac{N}{10}$ soda, then 1,000 Cc. = 12 Cc. $\frac{N}{1}$ soda. The medium is now neutral to phenolphthalein, but distinctly alkaline to litmus. Then subtracting 10 Cc. from 12 we have 2 Cc. of $\frac{N}{1}$ soda to be added to 1 litre of medium.

Glucose Broth consists of the above with the addition of 1 or 2% of pure anhydrous glucose added after final filtration, but prior to sterilisation.

A simple method of cultivating anaërobic organisms.—L. ii./03,1023.

Glycerin Broth.—Nutrient Broth containing 5 to 8 per cent. of Glycerin.

Litmus Broth consists of the addition of a sufficient quantity of Litmus solution to neutral broth to render it distinctly blue in colour.

Nutrient Gelatin.—Broth 1,000 Cc., gelatin 125 Gm. Melt in steamer, and clarify by adding the white of one egg, to which a little water may have been added, render faintly alkaline, place in steamer to make quite hot and filter in the same, leaving the portion containing the coagulated albumin, which will have subsided, carefully until the last. Run the medium into tubes, about 5 and 8 Cc. into each according as to whether 'slopes or 'stab' preparations are required. Sterilise on three successive days.

Glucose Gelatin consists of nutrient gelatin to which 1 or 2% glucose has been added after filtration. For the cultivation of anaërobic organisms and to observe gas formation. Must not be sterilised in the autoclave.

Nutrient Agar.—For this medium the following gives satisfactory results:—Nutrient broth 1,000 Cc., powdered agar-agar 20 Gm. (passed through a drug-mill and made as fine as possible); melt in the steamer, or better in an autoclave, allow to cool slightly, or, if time is an object, cool by shaking under a stream of cold water from the tap; add white of two eggs, *make just alkaline*, boil in the steamer or autoclave twenty minutes, and then transfer to a tall beaker; allow to get quite cold, remove the solid mass from the beaker, and cut off the bottom of the block of jelly containing

the coagulated albumin and sediment. The remainder is again thoroughly melted in the autoclave or steamer, and will then filter well (in the steamer). It may be poured into tubes, and sterilised in the autoclave for a quarter of an hour under a pressure of at least two atmospheres—or, in the steamer on three successive days. Instead of cutting off the sediment on setting, it may be kept out by straining the hot liquid through butter-cloth previous to filtration.

N.B.—The white of egg should be added when the medium has almost set—*i.e.*, as cool as possible—as the albumen coagulates at 65° C. and it acts purely mechanically by carrying down with it the particles of suspended matter.

Blood Agar is prepared by streaking nutrient agar with blood drawn under the strictest aseptic precautions from the finger, or from a freshly-killed animal. It may be used in the 'slope' form or as plates. Neisser's gonococcus grows favourably on this medium.

Glucose Agar consists of nutrient agar to which 1 or 2% glucose has been added after filtration. In the upright form is used also for deep stab cultivations of anaërobic bacteria. Must not be sterilised in the autoclave.

Glycerin Agar is nutrient agar with the addition of 5 to 8% of glycerin. Is a satisfactory medium for the growth of *Bacillus diphtheriæ*, *B. tuberculosis* and *Streptothrix actinomycosis*.

Maltose Agar.—Maltose 12, Peptone (in powder) 3, Agar 3·9, Water 300. This is prepared in the customary manner, but the product is not neutralised. Blaxall's formula is Maltose 12, Peptone 1½, Agar 9, Water 300. For ringworm cultivation.

Peptone-water.—Peptone 10 Gm., sodium chloride 10 Gm., tap water 1,000 Cc.; boil in the steamer one hour, filter, and sterilise. Not necessary to render alkaline. Used for the production of the indol reaction as one of the aids, for example, to distinction (?) of *B. typhi abdominalis* and *B. coli*. It was originally utilised for cholera-diagnosis. It is Dunham's solution.

Potato.—Large specimens are thoroughly cleaned and cut into 'half-cylinders' with a potato-borer. The brown peel is removed and the pieces soaked overnight in water to wash off excess of starch. Wide test-tubes (1 inch by 6 inches) are plugged and sterilised, and a little distilled water is placed with each half-cylinder in the tubes. The water prevents drying up in sterilising, which is effected by heating on three successive days. Must not be sterilised in the autoclave.

Milk.—The cream is skimmed from good cows' milk, and the resulting 'skimmed' milk sterilised in the steamer for ½ hour on three successive days.

May also be drawn direct by means of a catheter into sterile vessels with the strictest aseptic precautions. Organisms are said to grow better in this than in milk which has been heated.

Blood-serum.—The serum is separated from fresh blood obtained from the jugular vein of the sheep. It is centrifugalised and filtered through a sterile Chamberland

filter. (Th candle is heated in a muffle-furnace, or in a bright fire, if it has been previously used for the same purpose.) The filtrate may then be poured into sterile test-tubes, plugged—and inspissated, first at 80° C., then at 60° C., and the latter temperature is maintained eight to twelve hours, or more if necessary. The medium is finally tested after capping by incubating at 37° C. for twenty-four hours to ensure sterility.

Urine, Whey, Wort, Hay Infusion, Artificial Lacto-Serum.—P.J. ii./05, 274, 518.

WATER.

Bacteriological Examination.

Collection of Sample.—Collect the specimen in a sterile Winchester with strictest precautions.

If from a water-supply, the water should be allowed to run at least half an hour before collecting. If the water to be examined is from a reservoir or stream, surface water must be avoided by holding the Winchester at least one foot below the surface.

For comparative purposes it is important to know whether the water, *e.g.*, a well, has been recently disturbed by cleaning out or pumping. Also to examine as quickly as possible after collection of the specimen, particularly in the hot weather. To prevent increase in number of bacteria it is customary to pack the bottle in ice for transmission by rail, etc., to inhibit multiplication of the organisms.

Enumeration of Bacteria.—Agar and gelatin plates are prepared with varying quantities of the specimen, *e.g.*, 1·0, 0·5, 0·25, 0·1 Cc. and incubated at their respective customary temperatures and the colonies counted. The easiest way to do this is to draw sector lines with a paraffin pencil through the petri dish, count one section, and multiply out to obtain the number of bacteria in the entire amount of water taken for examination. Pakes' Discs are employed in a similar manner. If the sample is known to be very polluted, it is a useful plan to dilute with sterile water ten times or more, and take an aliquot portion for inoculating the plate. To obtain accurate results it is important to add the melted gelatin or agar medium to the specimen of water, and not the water to the medium. This procedure ensures better mixing.

The plates are examined daily, and if liquefying organisms are numerous (which suggest sewage pollution) the examination has often to be concluded in a shorter time than would be necessary where such are not present; if possible a week should be devoted to growth.

Text books are in the habit of laying down hard and fast statements as to the purity of a water depending upon the number of organisms thus found,—they condemn, for example, as very suspicious a water showing 1,000 organisms per Cc. It is obvious that the pathogenicity or otherwise of the bacteria must determine the conclusion. The high temperature (as for Agar plates) favours the development of the non-saprophytic organisms, but there are saprophytic

organisms which also prefer the higher temperature for their development, and hence a truer conclusion can be arrived at as to the number present by growing at both the high and the low temperatures. As glucose media are very favourable to the growth of many of the yeast and fungi it is advisable also to prepare a plate culture using this medium. Yeast and fungi are, therefore, often not included in the count with ordinary media owing to the non-favourable condition for their development. This fact has been demonstrated by us in working with ordinary laboratory tap-water and also with the atmospheric air.

The next step is to conduct individual search for various sewage polluting organisms, *e.g.*, *B. coli communis*, *B. typhi abdominalis*, *Vibrio choleræ*. *B. proteus*, *Klein's B. enteritidis sporogenes*, *Streptococcus*.

The search for *B. coli communis* is very important.

B. Coli Communis.—MacConkey's method is simplest. Fill ordinary test tubes into which Durham's tubes are introduced, with the following special broth (bile salt broth)—Sodium Taurocholate 0·5, Glucose 0·5, Peptone 2 Gm., Water 100 Cc. Add to several tubes of the broth varying amounts of the water from 0·1 up to 1·0 Cc. Incubate at 37°C. If *B. coli communis* be present there is gas production and indol production. It is a good plan to prepare agar plates by pouring or brushing, and after incubation to examine by the various cultural tests, *e.g.*, milk, indol, potato, motility, number of flagella, reduction of neutral red, and Pfeiffer's reaction.

In searching for B. typhosus, which is a very difficult matter, and almost invariably attended with negative result*, the enrichment method of Hoffman and Ficker is recommended side by side with some method of chemical precipitation.

Scheme of work to be done:—

1. Isolation.
   1. Filtration under pressure (not recommended).
   2. Chemical precipitation { Schüder's process. / Ficker's ,, / Alum ,, }
   3. Serum agglutination.
   4. Enrichment process, using water itself as medium.
   5. Cambier's process.
   6. Solid Media { Gelatin (Elsner's, &c.) / Bile Salt Agar. / Glucose and Lactose Agars. / Drigalski-Conradi Medium, Crystal Violet. / Endo's medium. }
2. Identification. { Morphological and cultural characters, &c. / Specific Reactions: Pfeiffer's Agglutination Test. }

Schüder's precipitation method consists in adding to 2 litres of the water, 20 Cc. of 7·75% Solution of Sodium

* To show the difficulty involved it may be mentioned that on addition of active typhoid bacilli to a Winchester of river-water or water containing sewage, and allowing a day or two to elapse, the organism could not be found. If present it must have altered its characteristics.

Hyposulphite, and 20 Cc. of 10% Lead Nitrate Solution. Plates are made from the precipitate containing the bacilli.

Ficker's precipitation method.—Render 2 litres faintly alkaline with Soda and add 7 Cc. of 10% Ferrous Sulphate Solution. The precipitate is dissolved in 25% neutral Potassium Tartrate, and plates are prepared.

Alum method.—Similar to the above by treating the sample with Aluminium Potassium Sulphate.

Serum Agglutination.—Add 1 Cc. of the sample to each of a number of broth tubes, and incubate at 37° C. three or four days. To those with sediment add a few drops of active anti-typhoid serum. Clumps are centrifugalised, and the clear liquid drawn off. Emulsify deposit and prepare plates.

Enrichment process.—To the sample add Nutrose 1%, Caffeine 0·5%, Crystal Violet 0·001%. Incubate 12 hours at 37°C. Isolate typhoid bacilli on plates,—the colon bacilli will have been almost entirely restrained in their growth; the method is, however, not wholly reliable.

Cambier's process.—By filtration of an incubated, inoculated alkaline peptone solution.

Of Solid Media.—Drigalski's is best. It consists of a nutrose-lactose-litmus agar with a trace (0·001%) of crystal violet. After incubation typhoid colonies are bluish white.

Endo's Medium.—An alkaline lactose agar containing fuchsin rendered colourless by sodium sulphite. Typhoid colonies colourless,—*B. coli* colonies are sufficiently acid to produce a bright red colour.—Jl. Hygiene, Oct., 1905, Vol. 5, No. 4.

Rapid method which may be utilised in search for B. typhosus.—"Concentrate" at least two litres of the water by filtration through Chamberland filter. Brush off the organisms from surface of candle into sterile vessel containing about 10 Cc. of sterile water. Brush plates with the emulsion and cultivate in the ordinary manner on gelatin and agar, or on a medium with the addition of Phenol (Parietti's for instance). After incubation suspicious colonies are picked out and cultivated on various media (*see p.* 882)—concluding with the Serum diagnosis method of Pfeiffer.

Kraemer finds that *B. typhosus* will live over four months in both tap and distilled water, though after two months bouillon cultures will not give agglutinating test.—Am. Jl. Phcy., June, 05,265.

Vibrio Choleræ.—To detect: inoculate peptone water, preferably in an Erlenmeyer flask with 100 Cc. of the water. Incubate and test for indol product and search for typical comma-shaped organisms, which are actively motile and decolorised by Gram's method. Test further with usual laboratory media, and also conduct serum agglutination test.

B. proteus.—The ordinary laboratory media and methods may be employed for the various types of *Proteus*. Attention has not been paid to any great extent to the possibility of this bacillus causing grave consequences in the human organism.

Klein's Bacillus Enteritidis Sporogenes.—Add to a fresh milk tube 1 Cc. of the water or a small quantity of the 'concentrated' water. Heat to 80°C. for 20 minutes to kill off other organisms, excepting spores of the organism searched for (Kitasato's method); grow in Buchner's tube, *i.e.*, in an atmosphere of nitrogen for 24 to 36 hours. If result be separation of milk, stringy curd, and excessive whey, test for pathogenicity on guinea pig. The animal succumbs within 36 to 48 hours (if very virulent in 24). Post-mortem signs: bloody œdema at seat of inoculation, offensive odour, hair of animal easily detached. Films stained by Gram's method from œdema fluid show typical non-sporing organisms. To further test, a blood serum tube is inoculated from the œdema fluid and incubated under anærobic conditions. The medium is eventually liquefied by the organism and films prepared from this show the typical sporing organism of Klein.

Streptococcus.—Glycerin Agar is a good medium for, but this medium is not quite so favourable for some of the other cocci. Agar plates may be brushed or prepared in the ordinary way, incubated at blood heat, and all discrete colonies examined by films and ordinary sub-cultures made on various laboratory media.

Conclusions.—The presence of any of the above organisms would indicate sewage contamination.

If *B. coli communis* be accompanied by the *Streptococcus* this would be considered dangerous (Horrocks).

NOTE.—A bacteriological examination according to provisions of Royal Institute of Public Health, 1903-1904, should include:—

(*a.*) Enumeration of the bacteria present on a medium incubated at room temperature (18 to 22°C).

(*b.*) Search for *B. coli* and identification and enumeration of the organism if present.

(*c.*) Enumeration of the bacteria present on a medium incubated at blood heat (36-38°C.).

(*d.*) Search and enumeration of streptococci. May also be advisable to search for *B. enteritidis sporogenes*.

NEUTRALISATION TABLE.

		Citric Acid. grains.	Tartaric Acid. grains.
Ammonium Carbonate Potassium Bicarbonate Sodium Bicarbonate	10 grains neutralise	12 7 8½	12½ 7½ 9

Lemon Juice (freshly expressed from *Citrus Medica var.* β, *Limonum*) contains from 30 to 40 grains Citric Acid per ounce. A good lemon yields on average an ounce of juice.

INTERNATIONAL, 1906, AND B.P. ATOMIC WEIGHTS.

In working out the Molecular Weights of Compounds, we have first indicated same in terms of the B.P. Values in the case of bodies containing elements mentioned in table on p. 435 of that work; then follow in brackets the weights calculated with the International Weights, 1906, marked "I. Wts." Many of the compounds Official in the U.S.P. have the U.S. Weights added in addition. All other bodies containing elements not in the B.P. are calculated in terms of the 1906 (O=16) International equivalents.

		I. Wts. 1906. O=16.	B.P. 1898. (H=1)
Aluminium	Al	27·1	26·90
Antimony	Sb	120·2	119·00
Argon	A	39·9	—
Arsenic	As	75·0	74·5
Barium	Ba	137·4	136·4
Bismuth	Bi	208·5	207·3
Boron	B	11	10·85
Bromine	Br	79·96	79·35
Cadmium	Cd	112·4	—
Cæsium	Cs	132·9	—
Calcium	Ca	40·1	39·71
Carbon	C	12·00	11·91
Cerium	Ce	140·25	139·2
Chlorine	Cl	35·45	35·19
Chromium	Cr	52·1	51·74
Cobalt	Co	59·0	—
Columbium	Cb	94	—
Copper	Cu	63·6	63·12
Erbium	E	166	—
Fluorine	F	19	—
Gadolinium	Gd	156	—
Gallium	Ga	70	—
Germanium	Ge	72·5	—
Glucinum	Gl	9·1	—
Gold	Au	197·2	195·70
Helium	He	4	—
Hydrogen	H	1·008	1·00
Indium	In	115	—
Iodine	I	126·97	125·90
Iridium	Ir	193·0	—
Iron	Fe	55·9	55·60
Krypton	Kr	81·8	—
Lanthanum	La	138·9	—
Lead	Pb	206·9	205·35
Lithium	Li	7·03	6·97
Magnesium	Mg	24·36	24·18
Manganese	Mn	55·0	54·52
Mercury	Hg	200·0	198·80
Molybdenum	Mo	96·0	—
Neodymium	Nd	143·6	—
Neon	Ne	20	—
Nickel	Ni	58·7	—
Nitrogen	N	14·04	13·94
Osmium	Os	191	—
Oxygen	O	16·00	15·88
Palladium	Pd	106·5	—
Phosphorus	P	31·0	30·80
Platinum	Pt	194·8	193·30
Potassium	K	39·15	38·83
Praseodymium	Pr	140·5	—
Radium	Ra	225	—
Rhodium	Rh	103·0	—
Rubidium	Rb	85·5	—
Ruthenium	Ru	101·7	—
Samarium	Sm	150·3	—
Scandium	Sc	44·1	—
Selenium	Se	79·2	—
Silicon	Si	28·4	—
Silver	Ag	107·93	107·11
Sodium	Na	23·05	22·88
Strontium	Sr	87·6	—
Sulphur	S	32·06	31·82
Tantalum	Ta	183	—
Tellurium	Te	127·6	—
Terbium	Tb	160	—
Thallium	Tl	204·1	—
Thorium	Th	232·5	—
Thulium	Tm	171	—
Tin	Sn	119·0	118·20
Titanium	Ti	48·1	—
Tungsten	W	184·0	—
Uranium	U	238·5	—
Vanadium	V	51·2	—
Xenon	X	128	—
Ytterbium	Yb	173·0	—
Yttrium	Yt	89·0	—
Zinc	Zn	65·4	64·91
Zirconium	Zr	90·6	—

The U.S.P. has adopted International 1905 Standards throughout (H=1) with the exception of Radium, which is given as 223·0.

FREEZING MIXTURES.

For cooling and setting suppositories, bougies, &c.

The following is a list of some freezing mixtures best prepared from commercial Crystalline Salts, and in a thick wooden vessel:—

		Temp. F. reached.
Ammonium Nitrate	1 part	+ 1·4
Water	1 „	
Sodium Nitrate	3 „	— 3
Dilute Nitric Acid	2 „	
Ice	2 „	— 5
Sodium Chloride	1 „	
Ammonium Nitrate	1 „	— 7
Sodium Carbonate	1 „	
Water	1 „	
Ice	24 „	— 18
Sodium Chloride	5 „	
Ammonium Nitrate	5 „	
Ice	3 „	— 23
Sulphuric Acid	2 „	
Ice	8 „	— 27
Hydrochloric Acid	5 „	
Ice	3 „	— 46
Dilute Nitric Acid	2 „	
Sodium Phosphate	3 „	— 50
Ammonium Nitrate	2 „	
Dilute Mixed Acids	4 „	
Ice	8 „	— 91
Dilute Sulphuric Acid	10 „	

PERCENTAGE AND GRAINS PER FLUID OUNCE EQUIVALENTS.

Percentage.	Grains per fluid ounce.	Percentage.	Grains per fluid ounce.
10·0	43·75	1·9	8·3
9·5	41·56	1·8	7·9
9·0	39·4	1·7	7·45
8·5	37·2	1·6	7·0
8·0	35·0	1·5	6·55
7·5	32·8	1·4	6·1
7·0	30·6	1·3	5·7
6·5	28·45	1·2	5·25
6·0	26·25	1·1	4·8
5·5	24·05	1·0	4·4
5·0	21·9	0·9	3·95
4·5	19·7	0·8	3·5
4·0	17·5	0·7	3·05
3·5	15·3	0·6	2·6
3·0	13·1	0·5	2·2
2·5	10·95	0·4	1·75
2·0	8·75		

Suppositories, Pastes, Creams and Ointments.

	°C.	°F.	Appearance and Consistence to Touch. Atmospheric Temperature, 11° C.
Oleum Theobromatis	31-32	87·8–89·6	Yellowish white, hard, brittle, and melts with ease.
Sevum Præparatum } partes æq. Oleum Theobromatis }	39	102·2	Rather hard and brittle, but melts with ease.
Paraffinum Molle } partes æq. Oleum Theobromatis }	33-34	91·4-93·2	Stiff paste. Easily softened with the fingers. Suitable for thick creams.
Paraffinum Molle	35-39	95-102·2	
Unguentum Cetacei	36	96·8	White, soft base.
Adeps	38	100·4	Soft, white, unctuous.
Japan Wax	50	122	Hard, tough, and tenacious, tallowy. Obtained from *Rhus* species.
Adeps Lanæ	40-44	104-111·2	Yellowish, stiff, tenacious, unctuous.
Oleum Theobromatis } partes æq. Cetaceum }	39-40	102·2-104	Hard. Melts easily between the fingers. Not so brittle as Oleum Theobromatis.
Sevum Præparatum	47	116·6	Soft and unctuous.
Cetaceum	46-50	114·8-122	Crystalline, scaly and slippery.
Unguentum Paraffini	47	116·6	Stiff unguent.
Ceresin } partes æq. Stearin }	52	125·6	Very hard white mass.
Cera Alba 1 } Oleum Theobromatis 6 }	51-52	123·8-125·6	Hard glossy mass. Easily melts between the fingers.
Japan Wax } partes æq. Hard Paraffin }	48-51	118·4-123·8	Hard, white and brittle.
Ceresin	52-53	125·6-127·4	Hard, like good paraffin.
Stearin	53-54	127·4-129·2	White, hard, crumbling substance.

	°C.	°F.	Appearance and Consistence to Touch. Atmospheric Temperature, 11° C.
Paraffinum Durum	54-57	129·2-134·6	Crystalline, hard and unctuous (slightly greasy).
Unguentum Resinæ	54	129·2	
Adeps 3 / Cera Alba 1	59	138·2	Stiff white pomade.
Adeps / Cera Alba partes æq.	58	136·4	Very hard, white mass.
Cetaceum / Cera Alba partes æq.	58-59	136·4-138·2	Hard as last, but not so white in appearance.
Cera Alba	62-64	143·6-147·2	White, hard, tenacious.
Carnauba Wax	85	185	Hard, yellowish, from leaf buds of *Copernicus cerifera*.
Carnauba Wax 1 / Oleum Amygdalæ 4	77-78	170·6 172·4	Stiff mass, melting easily.
Carnauba Wax 1 / Oleum Amygdalæ 3	78-79	172·4-174·2	Stiff ointment of brownish colour.
Cera Alba / Oleum Amygdalæ partes æq.	60-61	140·141·8	Hard and wax-like.
Cera Alba 1 / Oleum Amygdalæ 5	54	129·2	Stiff ointment.
Cera Alba 1 / Oleum Amygdalæ 9	52-53	125·6-127·4	Stiff ointment base.
Cera Alba 1 / Oleum Amygdalæ 19	48-49	118·4-120·2	Very soft creams.
Cera Alba 1 / Oleum Amygdalæ 39	43	109·4	

THERMOMETRIC EQUIVALENTS.

For temperatures below the freezing point of water :—

C.	F.	C.	F.	C.	F.	C.	F.	C.	F.
—	—	—	—	—	—	—	+	—	+
	°	°	°	°	°	°	°	°	°
0	40·0	31	23·8	22	7·6	16	3·2	7	19·4
9	38·2	30	22·0	21	5·8	15	5·0	6	21·2
8	36·4	29	20·2	20	4·0	14	6·8	5	23·0
7	34·6	28	18·4	19	2·2	13	8·6	4	24·8
6	32·8	27	16·6	18	0·4	12	10·4	3	26·6
5	31·0	26	14·8	17·778	0·0	11	12·2	2	28·4
4	29·2	25	13·0	—	+	10	14·0	1	30·2
3	27·4	24	11·2	°	°	9	15·8	0	32·0
2	25·6	23	9·4	17	1·4	8	17·6		

For temperatures above the freezing point of water :—

C.	F.	C.	F.	C.	F.	C.	F.
+	+	+	+	+	+	+	+
°	°	°	°	°	°	°	°
1	33·8	35	95·0	69	156·2	103	217·4
2	35·6	36	96·8	70	158·0	104	219·2
3	37·4	37	98·6	71	159·8	105	221·0
4	39·2	38	100·4	72	161·6	106	222·8
5	41·0	39	102.2	73	163·4	107	224·6
6	42·8	40	104·0	74	165·2	108	226·4
7	44·6	41	105·8	75	167·0	109	228·2
8	46·4	42	107·6	76	168·8	110	230·0
9	48·2	43	109·4	77	170·6	111	231·8
10	50·0	44	111·2	78	172·4	112	233·6
11	51·8	45	113·0	79	174·2	113	235·4
12	53·6	46	114·8	80	176·0	114	237·2
13	55·4	47	116·6	81	177·8	115	239·0
14	57·2	48	118·4	82	179·6	116	240·8
15	59·0	49	120·2	83	181·4	117	242·6
16	60·8	50	122·0	84	183·2	118	244·4
17	62·6	51	123·8	85	185·0	119	246·2
18	64·4	52	125·6	86	186·8	120	248·0
19	66·2	53	127·4	87	188·6	121	249·8
20	68·0	54	129·2	88	190·4	122	251·6
21	69·8	55	131·0	89	192·2	123	253·4
22	71·6	56	132·8	90	194·0	124	255·2
23	73·4	57	134·6	91	195·8	125	257·0
24	75·2	58	136·4	92	197·6	126	258·8
25	77·0	59	138·2	93	199·4	127	260·6
26	78·8	60	140·0	94	201·2	128	262·4
27	80·6	61	141·8	95	203·0	129	264·2
28	82·4	62	143·6	96	204·8	130	266·0
29	84·2	63	145·4	97	206·6	131	267·8
30	86·0	64	147·2	98	208·4	132	269·6
31	87·8	65	149·0	99	210·2	133	271·4
32	89·6	66	150·8	100	212·0	134	273·2
33	91·4	67	152·6	101	213·8	135	275·0
34	93·2	68	154·4	102	215·6	136	276 8

Thermometric Equivalents—*continued.*

C.	F.	C.	F.	C.	F.	C.	F.
+ o	+ o	+ o	+ o	+ o	+ o	+ o	+ o
137	278·6	178	352·4	219	426·2	260	500·0
138	280·4	179	354·2	220	428·0	261	501·8
139	282·2	180	356·0	221	429·8	262	503·6
140	284·0	181	357·8	222	431·6	263	505·4
141	285·8	182	359·6	223	433·4	264	507·2
142	287·6	183	361·4	224	435·2	265	509·0
143	289·4	184	363·2	225	437·0	266	510·8
144	291·2	185	365·0	226	438·8	267	512·6
145	293·0	186	366·8	227	440·6	268	514·4
146	294·8	187	368·6	228	442·4	269	516·2
147	296·6	188	370·4	229	444·2	270	518·0
148	298·4	189	372·2	230	446·0	271	519·8
149	300·2	190	374·0	231	447·8	272	521·6
150	302·0	191	375·8	232	449·6	273	523·4
151	303·8	192	377·6	233	451·4	274	525·2
152	305·6	193	379·4	234	453·2	275	527·0
153	307·4	194	381·2	235	455·0	276	528·8
154	309·2	195	383·0	236	456·8	277	530·6
155	311·0	196	384·8	237	458·6	278	532·4
156	312·8	197	386·6	238	460·4	279	534·2
157	314·6	198	388·4	239	462·2	280	536·0
158	316·4	199	390·2	240	464·0	281	537·8
159	318·2	200	392·0	241	465·8	282	539·6
160	320·0	201	393·8	242	467·6	283	541·4
161	321·8	202	395·6	243	469·4	284	543·2
162	323·6	203	397·4	244	471·2	285	545·0
163	325·4	204	399·2	245	473·0	286	546·8
164	327·2	205	401·0	246	474·8	287	548·6
165	329·0	206	402·8	247	476·6	288	550·4
166	330·8	207	404·6	248	478·4	289	552·2
167	332·6	208	406·4	249	480·2	290	554·0
168	334·4	209	408·2	250	482·0	291	555·8
169	336·2	210	410·0	251	483·8	292	557·6
170	338·0	211	411·8	252	485·6	293	559·4
171	339·8	212	413·6	253	487·4	294	561·2
172	341·6	213	415·4	254	489·2	295	563·0
173	343·4	214	417·2	255	491·0	296	564·8
174	345·2	215	419·0	256	492·8	297	566·6
175	347·0	216	420·8	257	494·6	298	568·4
176	348·8	217	422·6	258	496·4	299	570·2
177	350·6	218	424·4	259	498·2	300	572·0

The Reaumur scale (with zero at freezing point of water and the boiling point of water being 80°) is now little used.

To convert a temperature in Centigrade into Fahrenheit multiply by $\frac{9}{5}$ and add 32.

Conversely to transpose Fahrenheit into Centigrade subtract 32 and multiply by $\frac{5}{9}$.

To convert Centigrade into Reaumur multiply by $\frac{4}{5}$.

To convert Reaumur into Centigrade multiply by $\frac{5}{4}$.

To convert Fahrenheit into Reaumur subtract 32 and multiply by $\frac{4}{9}$.

To convert Reaumur into Fahrenheit multiply by $\frac{9}{4}$ and add 32.

SCHEDULE "A" OF POISONS.

APPLICABLE TO GREAT BRITAIN.

(*Within the Meaning of the Pharmacy Act*, 1868.)

PART I.

Not to be sold unless the purchaser is known to, or introduced by some person known to, the seller; also entry to be made in poison-book of (1) date of sale, (2) name and address of purchaser, (3) name and quantity of article, (4) purpose for which it is wanted—attested by signature; and must be labelled with (1) name of article, (2) the word "Poison," (3) name and address of seller.

Arsenic and its preparations.
Aconite and its preparations.
Alkaloids.—All poisonous vegetable alkaloids and their salts.
Atropine, preparations of.
Cantharides.
Cocaine and its salts.
Corrosive Sublimate.
Cyanide of Potassium and all metallic cyanides and their preparations.
Emetic Tartar.
Ergot of Rye and its preparations.
Picrotoxin.
Prussic Acid and its preparations.
Savin and its oil.
Strychnine and its preparations.
Vermin-killers, if preparations of poisons in this part of this schedule.

PART II.

Must be labelled with (1) name of article, (2) the word "Poison," (3) name and address of seller.

Almonds, Essential Oil of (unless deprived of prussic acid).
Belladonna and its preparations.
Cantharides, tincture and all vesicating liquid preparations of.
Carbolic Acid, liquid preparations of, and its homologues containing more than 3% of those substances, *except* any preparation prepared for use as sheep-wash, or for any other purpose in connection with agriculture or horticulture, and contained in a closed vessel, distinctly labelled with the word "Poisonous," the name and address of the seller, and a notice of the agricultural or horticultural purpose for which the preparation has been prepared, ought to be deemed poisons within the meaning.
Chloroform.
Chloral Hydrate and its preparations.
Cocaine, preparations of.
Corrosive Sublimate, preparations of.
Digitalis and its preparations.
Mercuric Iodide.
Mercuric Sulpho-cyanide.

Morphine, preparations of.
Nux Vomica and its preparations.
Opium and all its preparations; and preparations Poppies.
Oxalic Acid.
Precipitate, White (ammoniated mercury).
Precipitate, Red (red oxide of mercury).
Strophanthus and its preparations.
Vermin Killer (*i.e.*, every compound containing any poison within the meaning of the Act when prepared or sold for the destruction of vermin).

Regulations for the Keeping, Dispensing, and Selling of Poisons in Great Britain.

(*Under the Provisions of Section* 1 *of the* 1868 *Act.*)

1. That in the keeping of poison each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

2. Also that in the keeping of poisons each poison be kept on *one or other* of the following systems, viz. :—

(*a*) In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop or dispensary; or

(*b*) In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or

(*c*) In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.

3.—That in the dispensing and selling of poisons all liniments, embrocations, lotions, and liquid disinfectants containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

Abstract of the Act to Regulate the Sale of Arsenic

1851, 14 *Vict. Cap.* 13.

On every sale of Arsenic, particulars of sale to be entered in a book by the seller as follows :—

Day of Sale.	Name and Surname of Purchaser.	Purchaser's place of abode.	Condition or Occupation.	Quantity of Arsenic sold.	Purpose for which required

(Purchaser's signature.) (Witness.) (Seller's Signature.)

No person shall sell Arsenic to any person who is unknown to the person selling such Arsenic, unless the sale be made in the presence of a witness who is known to the person selling the Arsenic, and to whom the purchaser is known, and who signs his name, together with his place of abode, to such

ntities before the delivery of the Arsenic to the purchaser, nd no person shall sell Arsenic to anyone under full age.

The Arsenic must be coloured with Indigo or Soot, with ertain exceptions.

The penalty for offending against the Act is a fine of not xceeding £20.

The Act not to prevent sale of Arsenic in medicine under a edical prescription.

"Arsenic" to include Arsenious and Arsenic Compounds, nd the preparations of same.

Applicable to Ireland.

In accordance with the Sale of Poisons (Ireland) Act, 1870 *and additions since the passing of that Act.*]

Conditions of sale as under Parts I. and II. above.

PART I.

Arsenic and its preparations.
Prussic Acid.
Cyanides of Potassium and all metallic cyanides.
Strychnine and all poisonous vegetable alkaloids and their salts.
Aconite and its preparations.
Emetic Tartar.
Corrosive Sublimate.
Cantharides.
Savin and its oils.
Ergot of Rye and its preparations.

PART II.

Oxalic Acid and all oxalates.
Chloroform.
Belladonna and its preparations.
Essential Oil of Almonds, unless deprived of its prussic acid.
Opium and all preparations of opium or poppies.
Preparations of Corrosive Sublimate.
Preparations of Morphine.
Preparations of Strychnine.
Red Oxide of Mercury.
Ammoniated Mercury.
Biniodide of Mercury.
Every Compound containing any of the poisons mentioned in this schedule, when prepared or sold for the destruction of vermin.
Cantharides, the tincture and all vesicating liquid preparations of.
Phosphorus and all preparations containing it in a free state.
Chloral Hydrate and all its preparations.
Nux Vomica and its preparations.
Sulphuric Ether.
Phenol, commonly called carbolic acid.

DROP MEASURE TABLE

Showing the number of drops per gramme from various medicaments delivered (at 15°C.) by a standard pipette 3 mm. in external diameter (*see p.* xvii.). Adapted from F.E.

	No. of drops in 1 Gm.
Acetum Opii Compositum	54
Acidum Hydrochloricum (1·171)	21
,, Hydrocyanicum Dilutum (2%)	22
,, Nitricum, Sp. Gr. 1·321	25
,, Phosphoricum, Sp. Gr. 1·35 (50% H_3PO_4)	19
,, Sulphuricum, Sp. Gr. 1·843	26
,, Sulphuricum Alcoholisatum (Aqua Rabeliana) (Sulphuric Acid 1, Alcohol 3 cautiously mixed)	55
,, Sulphuricum Dilutum 10%	21
Æther	91
,, Aceticus, Sp. Gr. 0·915	60
,, Sulphuricus Alcoholisatus (Hoffman's Anodyne) (Ether 4 and Alcohol 1, mixed) ...	73
Aqua Distillata	20
Chloroformum, Sp. Gr. 1·48	60
Creosotum, Sp. Gr. 1·08	42
Liquor Ammoniæ, Sp. Gr. 0·923	24
Oleum Crotonis Tiglii (Aceite de Crotan Tiglio) ...	44
,, Menthæ Piperitæ, Sp. Gr. 0·89 to 0·92 ...	52
,, Terebinthinæ	56
Solutum Chloruri Ferrici, Sp. Gr. 1·26 (Liquor Ferri Perchloridi)	18
Tinctura Alcoholica Aconiti (1 of Root in 10) ...	58
,, ,, Belladonnæ, 1 in 10	59
,, ,, Cantharidis, 1 in 10 (with Cochineal 1·5 in 100) ...	58
,, ,, Castorei, 1 in 20	57
,, ,, Colchici, 1 in 10	59
,, ,, Corticis Aurantii (Naranja) Composita (Tinctura Roborans ex Whytt)	63
,, ,, Digitalis, 1 in 10...	58
,, ,, Fabæ Sancti (Haba de San Ignacio) (Ignatii Composita) Guttæ Amaræ ex Baumé 1 in 2	58
,, ,, Hamamelidis (bark and leaves of each 1 in 20)	58
,, ,, Hydrastis, 1 in 10	58
,, ,, Iodi (1 in 10, Alcohol 95%) (Solucion Alcohólica de Yodo)	62
,, ,, Lobeliæ, 1 in 10	58
,, ,, Moschi (Almizcle) 1 in 25 ...	55
,, ,, Nucis Vomicæ, 1 in 10, 0·25% Alkaloids approximately ...	57
,, ,, Opii (Extract 1 in 20)	58
,, ,, Scillæ (escila) 1 in 5	58
,, ,, Strophanthi (Estrofanto) 1 in 10	58
,, ,, Viburni, 1 in 10	58
(All the above tinctures are made with Alcohol 70%.)	
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THIS index supplies the name and adult dose (if used internally) of most of the drugs and preparations described in the foregoing pages. The doses are based on personal experience, or are culled from the best authorities.

Official names are printed in italics. To render the index comprehensive, many preparations in general use, not elsewhere mentioned, are included, with appropriate doses. Lists of Formulæ for **Antrophores, Aurinaria, Bougies, Capsules, 'Collapsubes,' Effervescent Preparations, Hypodermic Injections and Tablets, Lozenges (Trochisci), Ophthalmic Discs, Ovules, Pessaries, Pills, 'Solubes,' 'Sterules,' Suppositories, Tabellæ (Chocolate), Tablets (Compressed) and 'Vescettes'** are supplied.

For all **Acids** look under the word **Acid**, for **Salts** *vide* **Latin name of the base.**

For **Antitoxic Serums**, etc., *see* **Antitoxin.**

For **Capsules**, both gelatin and glass, *vide* **Capsules.**

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*	,, of Boric Acid in White Vaseline, 1 in 60		
	,, of Boric Cream		11
**†§	,, ,, Vaseline		12
†	,, of Dermatol Ointment, 10%		181
§	,, of Ferric Perchloride Ointment, 1 in 40		340
§	,, of Gall and Opium Ointment		527
§	of Hamamelis Ointment (and with Cocaine)		384
*	,, of Homatropine and Cocaine Oint., ea. 2%		
	,, of Hydrastis Ointment, containing 5% Liquid Extract		
**†§	,, of Iodoform, 5%, and Cocaine Oint., 2%		430
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†	,, of Thallin, 5%, with Cocaine, 2% Oint. ...		267
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,, Emblicæ	1 to 4 dr.	322
,, Guaiaci Composita	1 to 2 dr.	684
,, Opii, B.P. 1885	5 to 20 gr.	523
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,, Scammoniæ, B.P. 1885 ...	10 to 30 gr.	
,, *Sennæ*	60 to 120 gr.	618
,, ,, cum Jalapa		649
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,, Citras...	1-12 to 1-6 gr.	323
,, Hydrochloride	1-6 to ¼ gr. daily	323
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,, Zinc		719
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Crédé's Ointment and Silver	3-8 to 2 gr.	137
Cremor Magnesiæ	1 to 4 dr.	464
,, Zinci (et Calaminæ V.C.H.)		719
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Creosotal	5 to 20 gr.	305
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,, *Præparata*	10 to 60 gr.	
Creyat		xxiii
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Cuprea Bark		240
Cupri Acetas Neutrale	1-12 to ½ gr.	312
,, Alginas	$\frac{1}{24}$ to $\frac{1}{6}$ gr.	726
,, et Ammonii Acetas		312
,, Arsenis	1-100 to 1-25 gr.	146
,, -Aseptol, Cupri sulphocarbolas		23
,, Chloridum	½ to 2 gr.	313
,, Formas		34
,, Nucleinas		224
,, Oleas		505
,, Phosphas		312
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,, *Sulphas* ...	¼ to ½ gr.; emetic 5 to 10 gr.	312
,, Sulphocarbolas		23
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,, *Agropyri*	½ to 2 oz.	xxiii
,, *Aloes Compositum*	½ to 2 oz.	110
,, Apocyni	½ to 1 oz.	128
,, Cetrariæ, B.P. 1885...	*ad lib.*	
,, Cinchonæ, B.P. 1885	1 to 2 oz.	242
,, *Cissampeli*	½ to 2 oz.	xxv
,, Eucalypti Gummi	2 to 4 dr.	332
,, Euphorbiæ Piluliferæ	2 oz.	334
,, *Gossypii Radicis Corticis*	½ to 2 oz.	xxv
,, *Granati Corticis*, 1 in 5	½ to 2 oz.	
,, *Hæmatoxyli*	½ to 2 oz.	381
,, *Hygrophilæ*	½ to 2 oz.	xxvi
,, *Isphaghulæ*	½ to 2 oz.	xxvi
,, Pareiræ, B.P. 1885	1 to 2 oz.	
,, *Sappan*...	½ to 2 oz.	xxviii
,, Sarsæ and Compositum, B.P. 1885	2 to 10 oz.	
,, Scoparii and Taraxaci, B.P. 1885	2 to 4 oz.	
,, Tritici	2 to 8 oz.	704
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,, Zittmanni Fortius et Mitius		646
,, Zittmanni, 646, and Kobert		647
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,, -Morphine Hydrochloride ...	1-12 to 1-6 gr.	484
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,, Amorphe (Chloroformic) ...	1-60 to 1-30 gr.	317
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,, Pulv. Purum Germanicum, 1-64 to 1-32 gr....		318
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,, -Piperazine Tartrate	4 to 10 gr.	567
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,, Salicylate, 2 gr. in dr.	... 1 dr. or more	462
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,, *Sulphate*	¼ to 1 oz.	465
Nickel Bromide, 3 gr. in dr.	... 1 dr.	495
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,, and Caffeine, B.P.C.	... 1 or 2 dr.	261
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,, with Phenocoll, 5 gr. each in dr.	,,	566
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,, *Phosphate*... ...	... ¼ to ½ oz.	662
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,, Aletridis	½ to 1 dr.	726
,, Aromaticum	½ to 2 dr.	320

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,, Cinchonæ	... 30 to 60 m.	242
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,, Ferri Phosphatis cum Quinina et Strychnina	1 dr.	348
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,, Pohsphori	15 to 60 m.	548
,, Pini Terpin et Heroin	... ...	565
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,, Iodinol	2 dr.	437
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,, Olei Eucalypti	1 to 4 dr.	329
,, ,, Morrhuæ	2 to 8 dr.	512
,, ,, ,, et Glycerophosphatum	2 to 8 dr.	51
,, ,, ,, cum Ferro	2 to 8 dr.	512
,, ,, ,, cum Hypophosph. ...	2 to 8 dr.	512
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,, Citrate and Hydrochloride	1-150 to 1-30 gr.	325
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,, Menthæ Piperitæ, B.P. 1885	10 to 20 m.	
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,, Ozonic	½ to 1 dr.	411
,, Perles	3 m. in each	84
,, Soap and with Mercuric Iodide		645
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,, Bromide (and Capsules, 5 m.)		87
,, Carbamate	10 to 60 gr.	709
,, Chloride		88
,, ,, with Carbolic Acid, 2 %, and with Cocaine		89
,, ,, with Iodoform (Saturated)		89
,, ,, and Nitrous Oxide, combined use ...		90
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,, Narceine Hydrochloride	1 gr. daily	491
,, *Nitrite, Solution of*	20 to 60 m.	86
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,, Salicylate...		57
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,, Bromide	1 to 2 m.	87
,, -diamine Mercuric Sulphate		387
,, -diamine-silver Phosphate		135
,, -Ethenyl-diamine (Tartras, 568) ...	10 to 30 m.	567
,, Periodide		432
Ethyl-Morphine Hydrochloride	¼ to ½ gr.	483
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Ethylised Chloral Urethane	30 to 45 m.	230
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Euonymi Cortex		333
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Eupatorium, U.S.	10 to 30 gr.	726
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Euphorin	3 to 6 gr.	710
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,, Eye	2 dr.	796
,, Red Bone Marrow	1 to 2 dr.	793
,, Retinal	2 dr.	796
,, Spinal Cord	5 to 20 m.	794
,, Thymus Gland	½ to 2 dr.	804
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,, Aconiti	¼ to 1 gr.	79
,, ,, Radicis Alcoholicum	1-10 to 1-3 gr.	79
,, *Adhatodæ Liquidum*	20 to 60 m.	xxiii
,, Aesculi Hippocastani Liquidum		725
,, *Agropyri Liquidum*	1 to 2dr. xxiii.	704
,, Aletridis ,, ...	15 to 30 m.	726
,, Allii	4 to 10 gr.	726
,, *Aloes Barbadensis*	1 to 4 gr.	110
,, ,, Socotrinæ	2 to 10 gr.	110
,, *Anthemidis*	2 to 8 gr.	727
,, Apocyni Liquidum	15 m.	128
,, *Belæ Liquidum*	1 to 2 dr.	xxiv
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,, ,, Folii Alcoholicum...		172
,, ,, Foliorum, U.S.	Average, ½ gr.	172
,, ,, *Liquidum*	⅓ to 1 m.	172
,, ,, *Viride*	¼ to 1 gr.	171
,, Bynin (and Liquidum)	1 to 4 dr.	467
,, Cacti Grandiflori Liquidum ...	1 to 10 m.	732
,, Calumbæ, B.P. 1885	2 to 10 gr.	
,, *Cannabis Indicæ*	¼ to 1 gr.	205
,, Carnis...		353
,, *Cascaræ Sagradæ*	2 to 8 gr.	220
,, ,, ,, *Liquidum*	30 to 60 m.	220
,, ,, ,, ,, Insipidum	½ to 2 dr.	220
,, Cassiæ Beareanæ Liquidum ...	30 to 60 m.	732
,, Cerebri Liquidum	5 to 20 m.	795
,, Chelidonii Liquidum	10 to 30 m.	734
,, Chekan Fluidum	½ to 3 dr.	734
,, Chinæ	1 to 4 gr.	242
,, ,, Fluidum, P. Austr.		242
,, *Cimicifugæ Liquidum*	5 to 30 m.	240
,, ,, (solid), 1=1 ...	...average 4 gr.	240
,, Cinchonæ Flavæ Liquidum ...	10 to 30 m.	242
,, ,, *Liquidum*	5 to 15 m.	242
,, *Cissampeli Liquidum*	½ to 2 dr.	xxv
,, Cocæ	2 to 15 gr.	268
,, ,, *Liquidum*	½ to 1 dr.	268
,, Colæ Liquidum, P. Austr.		190
,, *Colchici* (Aceticum was B.P. 1885)	¼ to 1 gr.	291
,, Collinsoniæ Liquidum	15 to 60 m.	735
,, Colocynthidis, U.S.	average ½ gr.	295
,, *Colocynthidis Compositum* ...	2 to 8 gr.	111, 296
,, Condurango Liquidum	10 to 60 m.	297
,, Conii, B.P. 1885, 2 to 6 gr.; Liquidum	5 to 15m.	299
,, Convallariæ	2 to 8 gr.	300

	Name.	Dose.	Page
Extractum	Corn Silk, *syn.* Maidis Stigmata	20 gr. fl. 1 dr.	741
,,	Coto Liquidum	... 2 to 6 m.	300
,,	Damianæ, 2 to 10 gr. ; Liquidum	... ½ to 1 dr.	315
,,	Digitalis, U.S.	average 1-5 gr.	
,,	Dulcamaræ	... ...	751
,,	*Ergotæ*	... 2 to 8 gr.	324
,,	,, *Liquidum*	10 to 30 m.	323
,,	Erigeron Liquidum ...	...30 to 60 m.	736
,,	Erythroxyli Fluidum ...	...½ to 1 dr.	268
,,	Eucalypti Gummi Liquidum	30 to 60 m.	332
,,	Euonymi Liquidum ...	...10 to 60 m.	333
,,	,, *Siccum* ...	... 1 to 2 gr.	333
,,	Euphorbiæ Piluliferæ ...	½ to 1½ gr.	334
,,	Ferri Pomatum	... ...	344
,,	*Filicis Liquidum*	45 to 90 m.	351
,,	Frangulæ Liquidum ...	... 1 to 4 dr.	632
,,	Fuci Vesiculosi, 3 to 10 gr., Liquidum,	1 to 2 dr.	362
,,	Fungi Secalis Fluidum ...	... ...	323
,,	Galii	... 5 to 20 gr.	737
,,	Gelsemii Alcoholicum ...	½ to 2 gr.	365
,,	*Gentianæ*	... 2 to 8 gr.	737
,,	Geranii Maculati Fluidum	... 15 to 60 m.	737
,,	Glaucii Liquidum	... ... 1 dr.	737
,,	*Glycyrrhizæ*	... 5 to 60 gr.	372
,,	,, *Liquidum* ...	30 to 60 m.	372
,,	,, Purum, U.S.	...	372
,,	,, *Spirituosum* ...	½ to 1 dr. xxv,	373
,,	Gossypii Radicis Corticis	1 to 4 gr.	378
,,	,, ,, ,, *Liquidum*	½ to 1 dr. xxv,	378
,,	,, Seminis Pulverisatum ...	... 1 dr.	379
,,	Grindeliæ	.. 2 to 3 gr.	379
,,	,, *Liquidum* ...	10 to 20 m. xxv,	379
,,	Hæmatoxyli Liq. (& Solidum, U.S.)	½ to 2 dr.	381
,,	Hamamelidis Destillatum	... ½ to 3 dr.	382
,,	,, *Liquidum* ...	... 5 to 15 m.	383
,,	Hæmostaticum, F.E.	... ...	324
,,	Humuli, 2 to 6 gr. ; Liquidum	5 to 10 m.	463
,,	Hydrastis	... 2 to 5 gr.	407
,,	,, *Liquidum* or Fluidum	5 to 15 m.	406
,,	*Hyoscyami Viride*	... 2 to 8 gr.	418
,,	Hyoscyami, U.S.	... ... 1 gr.	418
,,	Ignatiæ amaræ Liquidum	... 1 to 10 m.	504
,,	Inulæ Liquidum	... 10 to 60 m.	739
,,	*Ipecacuanhæ Liquidum*	Expectorant ½ to 2m. Emetic ... 15 to 20 m.	445
,,	Iridis	... ...	449
,,	Jaborandi, 2 to 10 gr. ; *Liquidum*,	5 to 15 m...	450
,,	*Jalapæ*	... 2 to 8 gr.	454
,,	Jambul Liquidum ...	... ½ to 2 dr.	455
,,	Kavæ	... 5 to 10 gr.	740
,,	,, *Liquidum*	30 to 60 m. xxvi,	740
,,	Kolæ Liquidum	10 to 20 m.	190
,,	*Krameriæ*	... 5 to 15 gr.	458
,,	Lactucæ, B.P. 1885	... 5 to 15 gr.	
,,	Leptandræ, U.S.	Average, 4 gr.	741
,,	Lupuli, B.P. 1885	... 5 to 15 gr.	
,,	Maidis Stigmatum Fluidum	... 1 dr.	741

NAME.	DOSE.	PAGE
Extractum Maidis Ustilaginis Fluidum	...½ to 2 dr.	741
,, Malti, Liquidum and Solidum	1 to 4 dr.	467, 468
,, ,, Ferratum	1 to 4 dr.	468
,, ,, cum Glycerophosphatibus		50
,, ,, cum Oleo Morrhuæ ...	1 to 4 dr.	468
,, ,, cum Syrupo Ferri Phosphatis	1 to 4 dr.	468
,, Menyanthis et Glycyrrhizæ Liquidum	½ oz.	742
,, Myrtilli Liquidum...	1 oz.	744
,, *Nucis Vomicæ*	¼ to 1 gr.	502
,, ,, ,, *Liquidum*	1 to 3 m.	503
,, *Opii* (20% Morphine) ...	¼ to 1 gr.	523
,, ,, *Liquidum* (0·75% Morphine)	5 to 30 m.	523
,, Papaveris, B.P. 1885 ...	2 to 5 gr.	
,, *Pareiræ Liquidum*	30 to 120 m.	745
,, *Physostigmatis*	¼ to 1 gr.	557
,, Pichi Liquidum	10 to 60 m.	746
,, *Picrorhizæ Liquidum* ...	20 to 60 m.	xxvii
,, Pini Canadensis Liquidum ...	10 to 60 m.	746
,, ,, Sylvestris		564
,, Piscidiæ, 2 to 5 gr. ; Liquidum...	20 to 120 m.	571
,, Quassiæ, B.P. 1885...	3 to 5 gr. (U.S. 1 gr.)	747
,, Quebracho Liquidum	5 to 10 m.	589
,, Retinale	2 dr.	796
,, Rhamni Frangulæ,15 to 60 gr.; Liquidum	1 to 4 dr.	632
,, ,, Purshianæ, U.S ...	average 4 gr.	220
,, ,, ,, Fluidum, P. Austr. ...		220
,, *Rhei*, 2 to 8 gr. ; Compositum, P. Austr. ...		633
,, Rubi Chamæmori Liquidum ...	½ to 1 dr.	748
,, Salicis Nigræ Liquidum	¼ to 1[dr.	748
,, *Sarsæ Liquidum*	2 to 4 dr.	646
,, Senecionis Liquidum	20 to 60 m.	749
,, Sennæ Leguminorum Liquidum ...	1 to 2 dr.	649
,, Sorbi Aucupariæ Liquidum ...	10 to 30 m.	751
,, *Stramonii* (U.S. 1·4% alkaloids $\frac{1}{5}$ gr.)	¼ to 1 gr.	674
,, *Strophanthi*	¼ to 1 gr.	677
,, Strychni, P. Austr., P. Belg., Ph. Ned. ...		503
,, Sumbul, U.S..	Average dose 4 gr.	751
,, Supra-renal Liquidum	10 to 15 m.	800
,, ,, Siccum	½ to 3 gr.	799
,, Tanaceti Liquidum	15 to 30 m.	751
,, *Taraxaci*	5 to 15 gr.	751
,, ,, *Liquidum*	½ to 2 dr.	751
,, Teucrei Liquidum...	½ to 1 dr.	752
,, Tritici Liquidum	1 to 2 dr.	xxiii, 704
,, Tulipæ		752
,, Uvæ Ursi Liq.	20 to 40 m.	728
,, Valerianæ (Liquidum, 30 m.) ...	1 to 5 gr.	711
,, Viburni Prunifolii, 2 to 10 gr., Liq.	60 to 120 m.	xxix
,, Vincæ Majoris Liquidum ...	1½ dr.	753
,, Violæ Liquidum	1 dr.	753
,, Yerbæ Santæ	10 to 40 m.	754
Eye Bottles, 212; Douches, Droppers, 156; Irrigators, 157; Lotion, No. 1, 158; Pads, 375; Rods, 157; Shades		157
,, Extracts from		796
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Faex Medicinalis...	½ to 1 oz.	222
Fango Mud		816
Farrant's Mounting Medium		882
Fats, 352; Melting Points		891, 892
Favus		872
Fehling's Solution (and Allen's Modification), Pellets of		842, 843
Fel Bovinum Purificatum and Exsiccatum ...	5 to 15 gr.	334
Felt		375
Fennel Oil and Water		736
Fermentation as a Glucose Test		844
Ferments—Digestive		528
Ferratin	8 to 15 gr.	343
Ferri Albuminati, Liquor	1 to 4 dr.	344
,, Alginas, Alginoid Iron		726
,, *Arsenas*	1-16 to ¼ gr.	147
,, Bromidum	3 to 10 gr.	335
,, Cacodylas	¾ to 5 gr.	148
,, *Carbonas Saccharatus*	10 to 30 gr.	336
,, ,, ,, Concentratus		336
,, Chloridum, U.S. = Ferri Perchloridum		
,, Citras, U.S.	Average dose 4 gr.	338
,, *et Ammonii Citras*	5 to 10 gr.	338
,, ,, ,, Sulphas	3 to 10 gr.	350
,, ,, ,, Tartras, U.S.	4 gr.	350
,, ,, Magnesii Sulphas	2 to 10 gr.	350
,, ,, Manganesii Citras	3 to 15 gr.	350
,, ,, *Quininæ* Chloridum	1 to 3 gr.	594
,, ,, ,, *Citras*	5 to 10 gr.	591
,, ,, ,, ,, Effervescens	1 dr.	591
,, ,, Quininæ et Strychninæ Citras ...	3 to 6 gr.	679
,, ,, Strychninæ Citras	2 gr.	679
,, Fluoridum...	$\frac{1}{20}$ to ½ gr.	38
,, Glycerophosphas...	1 to 5 gr.	47
,, Hydroxidum, U.S.		338
,, ,, cum Magnesii Oxido, U.S.		142
,, Hypophosphis	1 to 5 gr.	551, **552**
,, Iodidum	1 to 5 gr.	345
,, Lactas	1 to 5 gr.	41
,, Lactophosphas (in Syrup)		42
,, Nucleinas	15 gr.	343
,, Oxalas	1 to 5 gr.	346
,, et Potassii Tartras, U.S.	4 gr.	350
,, Oxypersulphas (Monsel's Salt)		349
,, Peptonati, Liquor	1 to 4 dr.	344
,, Perchloridum (wool, 340)	2 to 8 gr.	339
,, *Phosphas*	5 to 10 gr.	346
,, ,, Solubilis, U.S....	4 gr.	346
,, Pyrophosphas, U.S.	4 gr.	555
,, Saccharatum, U.S. 1890=20% Ferrous Iodide ...		
,, Salicylas	3 to 10 gr. or more	59
,, Sesquioxidum		335, 341
,, Succinas		585
,, *Sulphas* (Granulatus, U.S. 3 gr.) ...	1 to 5 gr.	349
,, ,, *Exsiccatus*	½ to 3 gr.	349
,, Valerianas	3 to 5 gr.	711
Ferrichthol (Tablets)		424
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Ferrinol	15 gr.	343
Ferripyrin, Ferropyrin	... 3 to 8 gr.	263
Ferro-Alumen	... 3 to 10 gr.	350
Ferrocyanic Acid Test Pellets ...	... ...	29
Ferro Manganese Citrate	... 3 to 10 gr.	469
,, ,, with Quinine ...	... 3 to 5 gr.	469
,, ,, ,, Strychnine ...	... ... 1 gr.	469
,, ,, Phosphate	... 3 to 10 gr.	469
Ferrum	... ...	335
,, Dialysatum	... ...	342
,, Oxydatum Saccharatum ...	...10 to 40 gr.	343
,, *Redactum*	... 1 to 5 gr.	335
,, Sulphuricum Precipitatum ...	... ...	349
,, *Tartaratum*	... 5 to 10 gr.	350
Fersan	30 to 80 gr.	353
Fibrolysin	... ... 40 m.	652
Ficker's Precipitation of *B. typhosus* ...	... ...	887
Fig Syrup	... 1 to 4 dr.	321
Filaria (F. Bancrofti, 887)	... ...	868
Filix Mas, Filicin, Filmaron	 350,	351
Filmogen	... ...	293
Finsen Reyn Lamp	... ...	609
Fir Wool, Oil, and Extract	... ...	564
Fish Poisoning	... ...	587
Flagella Stains	... ...	878
Flax Seed	... ...	741
Fleabane	... ...	736
Fleming's Triple Stain	... ...	880
,, Tincture of Aconite ...	... 1 to 5 m.	80
,, Liquor Acidi-Chromo-Aceto-Osmici ...	...	45
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Fluorescent Light	... ...	609
Fluid Magnesia	... 1 to 2 ozs.	463
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,, Apocyni	... 15 m.	128
,, Aromaticum	... 15 m.	723
,, Aurantii Amari	... 15 m.	164
,, Belladonnæ Radicis... ...	... 1 m.	172
,, Berberidis	... 30 m.	409
,, Buchu	... 30 m.	186
,, Calami	... 15 m.	
,, Calumbæ	... 30 m.	731
,, Cannabis Indicæ	... 1 m.	208
,, Capsici	... 1 m.	215
,, Chimaphilæ	... 30 m.	734
,, Chiratæ	... 15 m.	734
,, Cimicifugæ	... 15 m.	240
,, Cinchonæ	... 15 m.	242
,, Cocæ	... 30 m.	269
,, Colchici Seminis	... 3 m.	291
,, Conii	... 3 m.	299
,, Convallariæ	... 8 m.	300
,, Cubebæ	... 15 m.	311
,, Cypripedii (1=1)	... 15 m.	
,, Digitalis	... 1 m.	316
,, Ergotæ	... 30 m.	325
,, Eriodictyi	... 15 m.	754

NAME.	AVERAGE DOSE.	PAGE
Fluidextractum Eucalypti	... 30 m.	303
,, Euonymi	... 8 m.	333
,, Eupatorii	... 30 m.	736
,, Frangulæ	... 15 m.	632
,, Gelsemii	... 1 m.	365
,, Gentianæ	... 15 m.	737
,, Geranii	... 15 m.	737
,, Glycyrrhizæ	... 30 m.	372
,, Granati	... 30 m.	542
,, Grindeliæ	... 30 m.	379
,, Guaranæ	... 30 m.	381
,, Hamamelidis Foliorum	... 30 m.	383
,, Hydrastis	... 30 m.	406
,, Hyoscyami	... 3 m.	418
,, Ipecacuanhæ	Emetic, 15 m. / Expectorant, 1 m.	446
,, Krameriæ	... 15 m.	458
,, Lappæ	... 30 m.	740
,, Leptandræ	... 15 m.	741
,, Lobeliæ	... 8 m.	741
,, Lupulini	... 8 m.	463
,, Matico	... 1 dr.	742
,, Mezerei	...	743
,, Nucis Vomicæ	... 1 m.	503
,, Pareiræ	... 30 m.	745
,, Phytolaccæ	Emetic, 15 m. / Alterative, 1½ m.	746
,, Pilocarpi	... 30 m.	450
,, Podophylli	... 8 m.	576
,, Pruni Virginianæ (Glycero-hydro-alcoholic)	... 30 m.	
,, Quassiæ	... 8 m.	747
,, Quercus	... 15 m.	747
,, Quillajæ	... 3 m.	747
,, Rhamni Purshianæ	... 15 m.	220
,, ,, Aromaticum	... 15 m.	220
,, Rhei	... 15 m.	633
,, Rhois Glabræ	... 15 m.	634
,, Rosæ	... 30 m.	747
,, Rubi	... 15 m.	748
,, Sabinæ	... 5 m.	748
,, Sanguinariæ	... 1½ m.	639
,, Sarsaparillæ (30% Alcohol approx.)	30 m.	646
,, ,, Compositum	... 30 m.	647
,, Scillae, 1 in 1 Acetic (was alcoholic 1890)	... 1½ m.	749
,, Scopolæ	... 1 m.	749
,, Scutellariæ	... 15 m.	749
,, Senegæ	... 15 m.	750
,, Sennæ	... 30 m.	649
,, Serpentariæ	... 15 m.	750
,, Spigeliæ	... 1 dr.	751
,, Staphisagriæ	... 1 m.	672
,, Stillingiæ	... 30 m.	673
,, Stramonii	... 1 m.	674
,, Sumbul	... 30 m.	751
,, Taraxaci	... 2 dr.	752

NAME.	AVERAGE DOSE.	PAGE
Fluidextractum Tritici	... 2 dr.	704
,, Uvæ Ursi	... 30 m.	728
,, Valerianæ	... 30 m.	711
,, Verati	... 1½ m.	713
,, Viburni Opuli	... 30 m.	xxix
,, ,, Prunifolii	... 30 m.	xxix
,, Xanthoxyli	... 30 m.	754
,, Zingiberis	... 15 m.	722
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Fluoroform as Aqua, 1 to 4 dr.		38
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Formin	Dose, 5 to 15 gr.	568
Formyl Terchloride	1 to 5 m.	230
Fortoin	4 gr.	301
Fotus Acid Borici, K.C.H., 6 dr. to 1 pint.		
,, Belladonnæ, K.C.H., 1 to 2 dr. of Tinct.		
,, Opii, K.C.H., ½ to 1 dr., as latter.		
,, Papaveris, K.C.H., 2 ozs. to 1½ pints 15 minutes: foment at 120°F.		
Fowler's Solution of Arsenic	2 to 8 m.	142
Fraenkel's Pneumococcus		871
Frangula Bark		632
Frankincense		563
Freezing Mixtures		890
French Chalk		456
Friar's Balsam	½ to 1 dr.	112
Friedlander's Pneumo-bacillus		871
Fröhde's Reagent		69
Fuchsine [Solution (stain), 875]	½ to 4 gr.	256
,, Anilin Green		875
Fucus Vesiculosus		362
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Fumus Potassii Nitratis		583
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Fungus igniarius, P. Austr., 727; Fungus Laricis ...		725
Furfuraldehyde (Furfurol P. Belg., Part II.)		93
Furonculin	one teaspoonful	223
Gabbett's Stain for Tubercle Bacilli...		876
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Galium Aparine		737
Galla	5 to 15 gr.	737

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Gamgee Tissue, 375; Ganja	... ...	205
Gardner's Syrupus Acidi Hydriodici	... 1 to 3 dr.	412
Garfield Tea	... ...	650
Garlic	... ½ to 2 dr.	726
Gargarisma Acidi Carbolici	... ...	19
,, Chlori	... .	658
,, Formaldehydi, G.H.	... ...	107
,, Hydrargyri Composita	... ...	402
,, ,, Perchloridi, 398; et Zinci Cyanidi		391
,, Potassii Chloratis, 658; Permanganatis	...	471
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Gauzes and Gauze Tissue, Ribbon, and Protective	...	375
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,, Hydronaphthol 3%, Ichthyol 10%, Picis 5%, Resorcin 3%, Sulphuris 4%	... ...	719
Gelatinum Glycerinatum, U.S. ...	... .	369
,, Zinci	... ...	719
Gelatum Petroleum	... ...	536
Gelsenin (Eclectic)	... ½ to 2 gr.	365
Gelseminina...	1-100 to 1-32 gr.	364
Gelsemininæ Hydrochloridum ...	1-60 to 1-20 gr.	364
Gelsemii Radix...	5 to 15 gr.	364
Genêt à Balais	... ...	670
Gentian Violet, Anilin	... ...	881
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Geoform = Guaiaform	... ...	306
Geoline	... ...	537
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Geraniol	... ...	517
Geranium Maculatum, Geranin ...	... 1 to 5 gr.	737
Gerhardt's Diacetic Acid Test ...	... ...	827
Germander, Water	... 10 to 20 gr.	752
German Silver	... ...	494
Gerrard's Cuprocyanic Test Solution	... ...	844
,, Peptonoids	... ...	546
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Giemsa's Stain	... ...	872
Gingerin	¼ to 1 gr.	723
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,, Thyroideæ Siccæ, U.S. ...	... ... 4 gr.	807

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Glaser's Salt	...30 to 120 gr.	585
Glass Dressings		213
,, Soluble, or Water Glass		663
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Glaucium Luteum (and Glaucine)		737
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Globulins		352
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Glonoin, Solution of, *syn.* Liq. Nitroglycerini,	½ to 2 m.	497
Glossina Palpalis		874
Glucantha...		560, 703
Glucose, 365; Glucose Agar		884
,, Broth and Gelatin		883
,, Fermentation Test		844
,, Syrup		560
,, Tests for, in Urine		842
,, Tubes (for artificial feeding)		366
Glucusimide, Glusidum, Gluside ...	... ½ to 2 gr.	636
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Glycaphorm	... 1 to 2 dr.	485
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Glycerin Agar, 884; Broth		883
,, Jelly (and Microscopic)		367
,, ,, Lubricant		367, 860
,, Soap, Liquid		645
,, Suppositories (and with Soap)		371
,, Tinctures		702
,, in Urine		847
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,, *Acidi Borici*, 6 in 20		9
,, ,, *Carbolici*, 1 in 5		19
,, ,, Hydriodici	20 to 60 m.	442
,, ,, *Tannici*, 1 in 5		367
,, Aloes		112
,, *Aluminis*, 1 in 6 (et c. Acidi Tannici)... ...		367
,, *Amyli*, 1 to 8		367
,, Atropinæ		157
,, Belladonnæ		172
,, Bismuthi Nitratis, 60 gr. to 1 oz. (F. E. Subnitrate 1 to 9 Glyc. Amyli.)		368
,, *Boracis*, 1 to 6		367
,, Carmini		218
,, cum Aqua Rosæ		368
,, Ferri Dialysati	30 to 60 m.	342
,, ,, Perchloridi		349
,, Glycerophosphatum Compositum	1 to 2 dr.	49
,, ,, cum Medulla Rubra	1 to 2 dr.	49
,, Hydrargyri Perchloridi		397
,, Iodi (Morton's Fluid)		436
,, Iodoformi		428
,, Kaolin Aceticum (Unna)		456
,, Pancreatis	1 to 2 dr.	530
,, Papain	1 dr. with meals	534
,, *Pepsini*	...½ to 2 dr.	544

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,, *Plumbi Subacetatis*		368
,, Resorcin		630
,, Sodii Cinnamatis, 10% Sol. ...	30 to 60 m.	28
,, *Tragacanthæ*		703
Glyceritum Acidi Tannici, U.S.		367
,, Boroglycerini, U.S.		9
,, Ferri, Quininæ et Strychninæ Phosphatum	15 m.	348
,, Hydrastis, 30 m., 407; Phenolis		19
,, Vitelli		369
Glycero-alcohol	5 to 60 m.	369
,, Arsenates		51
Glycerole of Bismuth and Sodium Tartrate ...	1 dr.	544
,, ,, Diacetyl-morphine Hydrochloride	1 to 2 dr.	485
,, Easton...	15 m.	348
,, of Glycerophosphates	1 to 2 dr.	49
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,, ,, Hypophosphites	1 dr.	555
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,, Oil (Mercurial)		385
Griffith's Mixture	½ to 1 oz.	338
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Guaiacol (F.E.) (and Crystal)	1 to 5 m.	302, 306
,, Benzoate	4 to 12 gr.	307
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,, Camphorate	5 to 10 gr.	308
,, Carbonate	3 to 8 gr.	308
,, Cinnamate	5 to 15 gr.	308
,, Phosphate	½ to 3 gr.	308
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,,	,, Bimeconatis, 1%	5 to 40 m.	482
,,	,, *Hydrochloridi*, 1% ...	10 to 60 m.	481, 525
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,, Borocitras	15 to 30 gr.	12
,, Bromidum	10 to 20 gr.	183
,, Cacodylas	¾ gr.	149
,, *Carb. Levis*, *Pond.*	30 to 60, or 5 to 30 gr. repeated	463
,, Chloridum	¼ to 1 oz.	464
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,, Hydroxidum	5 to 120 gr.	464
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,, ,, ,, with Strychnine ...	1 gr.	469
,, ,, Phosphate...	3 to 10 gr.	469
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Pil. Hydrarg., 3 gr. / Opii Pulv., ¼ gr.	... ... 2 or 3 times a day	
Hænii, P. Belg. = Aloes Pilulæ Compositæ: Aloes 0·1 Gm., Scammony Resin 0·03, Jalap Resin 0·03, Ginger 0·04, Soap 0·1 Gm.		
Hydrarg. cum Creta, 1-3 gr.,	½ gr. every 1 or 2 hrs.	
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Hydrarg. Subchlor., 1 gr., 2 gr. / Opii Pulv., ¼ gr., 1 gr.	1 every 4 hours	
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Ichthyol, Ammonium 2½ gr., Lithium- and Sodium- (of either 1½ gr.)	4 to 12 daily	422
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Ipecacuanhæ cum Scilla (5% Opium)	4 to 8 gr.	447
,, *cum Urginea*	4 to 8 gr.	xxviii
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{ Pepsin gr. 1, Quin. Sulph. gr. 1, Strychninæ gr. $\frac{1}{30}$, Extract. Taraxaci gr. 2.—Gowers. }		
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,, (Martindale), 1-100, 1-50, and 1-30 gr.	1 after meals	549
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,, Ferro et Nuce Vomica	,,	550
,, Ferro et Quinina ...	,,	550
,, Ferro, Quinina et Strychnina	,,	550
,, Nuce Vomica		550
,, Quinina...	,,	550
,, Strychnina (et Ferro, 551)	,,	550
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Plumbi cum Opio (12½% Opium) ...	2 to 4 gr.	524
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Podophyllin 1-30, 1-20, 1-15, 1-6, ¼, 1-3, ½, 1 gr.		576
,, Comp. (Resin ¼ gr.)	1 or 2 at bedtime	576
,, (Resin 1-12 gr.)	et Quininæ with dinner	576
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,, Iodidi, 1 gr.		582
,, Permanganatis, 1, 1½, 2, 3, 4 and 5 gr. ...		472
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,, Salicylatis, 3 gr. ...	every 6 hours	596
,, *Sulphatis*, 1, 2, 3, 4 and 5 gr.		598
,, Valerianatis	1 gr.	601
Rhei Compositæ, 2½ gr., 3 gr., 4 gr. and 5 gr....		633
{ Pil. Rhei Comp., 4 gr. Ext. Nucis Vom., ½ gr. }	2 or 3 times daily.	
{ Pil. Rhei Comp., 2½ gr. Ext. Taraxaci, 2½ gr. }	at dinner or bedtime	
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Saponis Compositæ (20% Opium) ...	2 to 4 gr.	524
Scammonii Compositæ	4 to 8 gr.	648
Scillæ Compositæ	4 to 8 gr.	749
Sodii Arsenatis, 1-32 and 1-64 gr.		147
,, Cacodylatis, ½ gr.		149
,, Oleatis		643
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,, Phosphidi, 1-6 gr. ...	1 thrice daily	551
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Zinci Valerianatis Co., N.H.W. = Zinci Valerianate 1½ gr., Asafœtida 2 gr., Ext. Bellad. 1-12 gr.		
Zittmann's L L. { Hydrargyri Subchloridi, 2 gr. / Extracti Colocynthidis Compositi, 5 gr. / Extracti Hyoscyami, 2 gr.		
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,, Salicylate, 567; Water, Aërated		566
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,, Guaiacolate	5 to 30 gr.	309
,, -para-Sulphamine Benzoate	5 gr.	571
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,, ,, Effervescens	1 dr.	
,, Cobalto-nitris	½ gr.	580
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,, *Præparatum*		549
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,, ,, Sounds		134
,, *Oxide*	½ to 2 gr.	135
,, Trinitrophenol		135
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,, and Spirit Lotion		645
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,, Anhydro-Methylene Citrate	15 to 30 gr.	107
,, *Arsenas* (*Off.* Exsicc.)	1-40 to 1-10 gr.	147
,, ,, U.S. + $7H_2O$	average 1-10 gr.	147
,, ,, Exsiccatus, U.S.... ...	,, 1-20 gr.	147
,, *Benzoas*	5 to 30 gr.	5
,, *Biboras*	5 to 20 gr.	12
,, *Bicarbonas*	5 to 30 gr.	656
,, Bisulphas		664
,, Boro-Salicylas	5 to 45 gr.	9
,, ,, Tartras	30 gr.	12
,, *Bromidum*	5 to 30 gr.	183, **656**
,, Cacodylas	½ to 1 gr.	149
,, Caffein-Iodidum	2 to 10 gr.	194
,, Carbolas		20
,, *Carbonas* (*Exsiccatus*, 3 to 10 gr.) ...	5 to 30 gr.	657
,, ,, ,, Monohydratus, U.S....	4 gr.	657
,, Chloras	10 to 30 gr.	658
,, *Chloridum*	10 to 60 gr.	653
,, Cinnamas	3 to 5 gr.	27
,, Citras	10 to 60 gr.	659
,, *Citro-Tartras Effervescens*	1 to 2 dr.	
,, Coumaras, ortho-	5 gr. in solution	30
,, ,, meta-and para		31
,, Dioxidum		412
,, et Ammonii Phosphas		663
,, et Magnesii Sulphas Effervescens	1 dr. or more	665
,, ,, ,, cum Caffeina	1 dr. or more	666
,, Ethylas		659
,, Ethyl-sulphas	¼ to 1 oz.	668
,, Fluoridum	1-20 to ½ gr.	38
,, Formas	1-6 to 3 gr.	33
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,, Hippuras	5 to 30 gr.	6
,, Hydroxidum		660
,, Hypobromitis Solution, 660; Hypochloris ...		659
,, *Hypophosphis*	3 to 10 gr.	551, **554**
,, *Hyposulphis*	10 to 60 gr.	70
,, Iodas, 40; *Iodidum*	5 to 20 gr.	661
,, Lactas	5 to 10 gr.	42
,, Meta-oxy-cyano-cinnamas	1½ gr.	32
,, Methylarsenas	2-5 to 3 gr.	151
,, Nitras, 15 gr., 661; Molybdas...		69
,, *Nitris*	1 to 2 gr.	661
,, Nitrophenyl-propiolas, 846; Nitroprussidum ...		827
,, Oleas	2 to 4 gr.	595, **643**
,, Ortho-coumaras...	5 gr. in solution	30
,, Orthonitrophenylpropiolas		846
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,, Perboras, 13; Permanganas		472
,, Peroxidum, in cubes (Official in F.E.)		412
,, Persulphas	1 to 3 gr.	664
,, *Phenol-para-sulphonas*	5 to 15 gr.	23
,, Phenol-sulphoricinas		516
,, Phenylpropiolas		28
,, *Phosphas* ¼ to ½ oz. or 30 to 120 gr. repeated, 48,		**662**
,, ,, Acidus...		663
,, ,, *Effervescens*	1 to 3 dr.	662
,, ,, Exsiccatus	10 gr. to 4 dr.	662
,, ,, Neutralis		661
,, *Potassii Tartras*	2 to 4 dr.	667
,, Pyrophosphas, U.S.	30 gr.	663
,, *Salicylas*	10 to 30 gr.	60
,, ,, Effervescens	1 dr. or more	60
,, Silicas		663
,, Succinas	5 gr.	668
,, Sulphanilas...	5 to 15 gr.	252
,, *Sulphas* ... ¼ to ½ oz. or 10 to 120 gr. repeated		665
,, ,, Acidus		664
,, ,, *Effervescens*	60 gr. or more	665
,, ,, Exsiccatus	½ to 2 dr.	665
,, Sulphethylas	¼ to 1 oz.	668
,, Sulphidum		667
,, *Sulphis*	5 to 20 gr.	667
,, *Sulphocarbolas*	5 to 15 gr.	23
,, Sulphocyanidum	5 gr.	668
,, Sulpho-Ichthyolas	10 to 30 gr. daily	422
,, Sulphoricinas		516
,, Sulphovinas	¼ to 1 oz.	668
,, Tartras Neutrale	½ to 1 oz.	668
,, Tauro-cholas	2 to 6 gr.	668
,, Telluras	⅓ to ⅔ gr.	669
,, Tetra-iodofluorescein = Erythrosin, *q.v.*		
,, *Thiosulphas*	10 to 60 gr.	70
,, Valerianas	1 to 5 gr.	712
,, Vanadas	1-32 gr.	753
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,, ,, Salicylate=Diuretin		
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,, Borax Co.		10
,, Borax and Cocaine Co.		10
,, Cocaine Hydrochlor, 1, 1⅛, 2¼, and 5 gr. ...		276
,, Dental, Antiseptic		20
,, Eucaine, 1 and 5 gr.		283
,, ,, 0·05 Gm. and Sodium Chloride 0·2 Gm.		283
,, Perchloride		399
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1 in a pint ,, =1 in 1,000.		
1 in a pint ,, =1 in 500,		
,, Phenol. 5 and 20 gr.		16
,, Plumbi et Opii		525
,, Potassii Permanganatis, 5 gr.		472
,, Protargol, 4·4 gr.		139
,, Sodii Chloridum		655
,, Zinci Permanganatis, ¼ gr.		720
,, Zinc Sulphate, and with Alum, 10 gr. each ...		722
,, Zinc Sulphocarbolate, 2 and 10 gr.		24
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,, Creosoti Composita. *Brompton Hosp.*		305
,, Hydrargyri-iodo-cacodylatis	15 m.	149
,, Phenoli		18
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,, Normal Saline, and Tubes of		653
,, *of Coal Tar*		247
,, *of Potassio-Cupric Tartrate*		842
,, ,, Mercuric Iodide		854
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Sparteinæ Sulphas	¼ to 1 gr.	662
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,, ,, *Compositus*	60 to 90 m. or 20 to 40 m. rep.	85
,, ,, *Nitrosi*	60 to 90 m. or 20 to 40 m. rep.	85, 86
,, Ammoniæ, U.S.	15 m.	120
,, ,, *Aromaticus*	60 to 90 m. or 20 to 40 m. rep.	120
,, ,, *Fetidus*	60 to 90 m. or 20 to 40 m. rep.	120
,, Amygdalæ Amaræ, U.S.	av. 8 m.	122
,, *Anisi* (1 in 10) (and U.S.	5 to 20 m.	727
,, *Armoraciæ Compositus*	1 to 2 dr.	734
,, Aurantii Compositus, U.S.		320
,, *Cajuputi*, 1 in 10	5 to 20 m.	
,, *Camphoræ*, 1 in 10, 5 to 20 m. 202; Fortior, 2 to 5 m.,		203
,, Capillaris Unna		631
,, *Chloroformi* (*Chloric Ether*)	5 to 40 m.	237
,, *Cinnamomi*, 1 in 10 (and U.S.) ...	5 to 20 m.	
,, Coloniensis		100
,, Creosoti	1 dr.	304
,, Frumenti = Whisky, U.S. (37 to 47% by Wt. Alc.)		99
,, Gaultheriæ, U.S.	av. 30 m.	57
,, Glonoini	½ to 2 m.	497
,, Glycerylis Nitratis, U.S.	av. 1 m.	498
,, Hydrargyri Biniodidi		392
,, *Juniperi*, 1 in 20 (and U.S.) ...	20 to 60 m.	739
,, ,, Compositus, U.S. ...	av. 2 dr.	739
,, *Lavandulæ*, 1 in 10 (U.S. 1 in 20)	5 to 20 m.	741
,, *Menthæ Piperitæ*, 1 in 10 ...	5 to 20 m.	473
,, ,, Viridis, U.S.	av. 30 m.	473
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,, *Myristicæ*, 1 in 10	5 to 20 m.	744
,, Nucis Juglandis	1 to 4 dr.	739
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,, *Rosmarini*, 1 in 10		518
,, Saponatus, P.G., Saponis Alkalinus, Kalinus ...		644
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Atoxyl	... ½ gr.	152
Atropine Sulphate, 1-100 gr.		
Beta-Eucaine, ¼ gr.		
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,, Hydrochloride Acid	... 2 gr.	593
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,, Sulphate, 1 gr., with Cocaine, 4 gr.		558
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,, Carbonas	5 to 30 gr.	675

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,, Glycerophosphas	3 to 8 gr.	49
,, Iodidum...	5 to 20 gr.	675
,, Lactas	5 to 30 gr.	675
,, Perboras	...	14
,, Salicylas...	5 to 20 gr.	676
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,, Allii	...10 to 30 m.	726
,, Alterans	... 1 to 4 dr.	673
,, Ari...	... 1 dr.	752
,, *Belladonnæ*	... 5 to 15 m.	173
,, Chelidonii	... 10 to 60 m.	734
,, *Conii*	1 to 2 dr.	299
,, Digitalis	... 5 to 10 m.	316
,, Galii	... 1 to 2 dr.	737
,, *Hyoscyami*	½ to 1 dr.	418
,, *Scoparii*	... 1 to 2 dr.	
,, *Taraxaci*	... 1 to 2 dr.	751
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,, ,, *Carbolici*, 1 gr.		21
,, ,, *Tannici*, 3 gr. (and with Opium) ...		72
,, ,, ,, cum Belladonna		72
,, ,, ,, ,, Morphina		72
,, Adrenalin, 10 m., 803; Anusol		177
,, Aristol, 1 gr., 432; Atropinæ, 1-20 gr. ...		
,, *Belladonnæ*, 1½ gr.		173
,, ,, et Morphinæ, ¼ gr.		174
,, Bismuthi Oxychloridi, 10 gr...		178
,, ,, Salicylatis	10 gr.	179
,, ,, Subnitratis	10 gr.	80
,, Carnis, 545; Chloral, 5 gr.		228
,, Cocainæ, 1-6 gr. or more, c. Morphine ½ gr.		272
,, Collargol...	2½ gr.	137
,, Eucalypti Gummi, 5 gr.		332
,, Gallæ, 5 gr., and c. Opio, 1 gr.		
,, *Glycerini*		371
,, Hamamelin, 1 gr. and 3 gr.		383
,, Hamamelidis Compositа		383
,, Ichthyol, 3 gr. (Gelatin or Cacao Butter)		422
,, *Iodoformi*, 3 gr., also 1 gr. and 5 gr. ...		430
,, ,, with Eucalyptus Oil, 5 m. ...		
,, Krameriæ Ext. (et c. Morph. HCl. $\frac{1}{10}$ gr.) 8 gr.		458
,, *Morphinæ*, ¼, ½, 1, 1½, and 2 gr. ...		481
,, Opii, 1 gr.		
,, *Plumbi Acetatis*, 3 gr. *c. Opio*, 1 gr. ...		525
,, Ranunculi Ficariæ Ung.		629
,, Santonini, 3 gr., 5 gr., and 6 gr.		640
,, Supra-renal Ext. Liq. (and with Morphine)		800
,, Trypsin		533
Supra-renal Capsule and Extract, Dry, Desiccated, Liquid Extract, Suppositories (and with Morphine, ½ to 3 gr.), Injection (Hypodermic and Uterine), Ointment, Snuff, Spray, Tabellæ (Chocolate) 1 or more, 798, *et seq.*		
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,, Acidi Hydriodici, 1%	20 to 60 m.	442
,, ,, Citrici		464
,, Allii Aceticus	1 to 4 dr.	726
,, Apomorphinæ Hydrochloridi ...	½ to 1 dr.	130
,, *Aromaticus*	½ to 1 dr.	321
,, *Aurantii*	½ to 1 dr.	164
,, *Aurantii Floris*	½ to 1 dr.	164
,, Butyl Chloral	1 to 4 dr.	187
,, Calcii et Ferri Lactophosphatum	½ to 1 dr.	42
,, ,, *Lactophosphatis*	½ to 1 dr.	42
,, ,, Hypophosphitis	1 to 4 dr.	552

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,,	*Cascaræ Aromaticus*	½ to 2 dr.	219
,,	*Chloral*...	½ to 2 dr.	229
,,	Cocainæ	... 1 dr.	276
,,	*Codeinæ*	½ to 2 dr.	289
,,	Coffeæ	... ...	191
,,	Digitalis	... ...	317
,,	Eastonii...	½ to 1 dr.	347
,,	,, Liquor pro...	9 to 18 m.	347
,,	Eucalypti Gummi	30 to 60 m.	332
,,	,, Rostratæ	½ to 1 dr.	332
,,	Ferri Bromidi	½ to 1 dr.	335
,,	,, ,, cum Quinina ...	½ to 1 dr.	336
,,	,, ,, ,, ,, et Strychnina,	1 dr.	336
,,	,, ,, ,, Strychnina ...	½ to 1 dr.	336
,,	,, et Manganesii Phosphatum ...	... 1 dr.	346
,,	,, ,, Quininæ Citratis	... 1 dr.	591
,,	,, ,, ,, Hydrobromatum	½ to 1 dr.	336
,,	,, ,, ,, Iodidi	... 1 dr.	595
,,	,, Hypophosphitis	½ to 2 dr.	553
,,	,, *Iodidi*	½ to 1 dr.	345
,,	,, *Phosphatis*	½ to 1 dr.	346
,,	Ferri Phosphatis Compositus ...	½ to 2 dr.	346
,,	,, ,, *cum Quinina et Strychnina* ('Easton Syrup')	½ to 1 dr.	347
,,	Ficorum...	1 to 4 dr.	321
,,	*Glucosi*	... ...	560
,,	Glycerophosphatum (Robin) ...	1 to 4 dr.	51
,,	,, Compositus ...	1 to 2 dr.	50
,,	,, cum Formatibus	1 dr.	51
,,	*Hemidesmi*	½ to 1 dr.	
,,	Hypophosphitum Compos., B.P.C.	½ to 2 dr.	554
,,	,, ,, 'American'	av. 1 dr.	555
,,	,, U.S. ...	2 dr.	554, 555
,,	Iodo-Tannicus	½ to 2 dr.	439
,,	Ipecacuanhæ Acet.. B.P.C., P.G.. U.S.,	¼ to 2 dr.	447
,,	Krameriæ, U.S., 1 dr., 458; *Limonis*	½ to 1 dr.	
,,	Lactucarii, U.S.	2 dr.	419
,,	Mori	1 dr.	743
,,	Niccoli Bromidi	1 dr.	495
,,	Opii, P. Austr.	...	525
,,	Papaveris	1 dr.	
,,	Picis Liquidæ	1 to 2 dr.	572
,,	,, cum Codeina	½ to 2 dr.	572
,,	Pilocarpin et Potassii Bromidi	1 dr. to 1½ oz.	452
,,	Pini Pumilionis	1 dr.	565
,,	Potassii Cyanidi cum Morphina ...	1 dr.	581
,,	*Pruni Virginianæ*	½ to 1 dr.	586
,,	*Rhei*	½ to 2 dr.	634
,,	,, Aromaticus, U.S. ...	2 dr.	634
,,	*Rhœados*	½ to 1 dr.	xxx
,,	*Rosæ* (and U.S.)	½ to 1 dr.	747
,,	Rubi	1 dr.	748
,,	Sarsaparillæ Co., U.S.	4 dr.	
,,	*Scillæ* (and Compositum, U.S. 30 m.)	30 to 60 m.	749
,,	Senegæ, U.S.	1 dr.	750
,,	*Sennæ* (cum Manna, 650)	½ to 2 dr.	649

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Syrupus Sodii Formatis (Elixir)	2 dr.	33
,, ,, Hypophosphitis	1 to 4 dr.	554
,, Sulphatum	4 dr.	200
,, Tann-Iodo-phosphoratus	½ to 2 dr.	440
,, *Tolutanus*	½ to 1 dr.	729
,, Triplex, 348; Trium Phosphatum		347
,, *Urgineæ*	½ to 1 dr.	xxix
,, *Zingiberis*	½ to 1 dr.	723
Sydenham's Laudanum	5 to 20 m.	526
Sys Specific, 524; Syzygium Jambolanum...		455
Tabellæ, Chocolate Tablets—		692
,, Antiasthmaticæ		499
,, Apomorphinæ, 1-50 and 1-30 gr.		129
,, Bismuthi et Pepsinæ, 3 gr. each		546
,, Caffeinæ Citratis, 1 gr.		192
,, Cocainæ, 1-20 gr., also 1-12, 1-10, 1-8 gr., &c....		272
,, Erythrol Nitratis, ⅓, ¼, ½ and 1 gr. ...	1 or 2	327
,, Exalgin, ½ gr.		255
,, *Glonoini*, 1-10 gr.	1 or 2	...
,, Mannitol ,1 gr.		327
,, Menthol, 1-5 gr.		476
,, Nitroglycerini, 1-600, 1-400, 1-200, 1-100, 1-75, 1-50, 1-25 gr., and 1 mgr. ...	1 or 2	498
,, Nitroglycerini Compositæ	1 or 2	499
,, Pepsinæ, 3 gr., 546; Quininæ Tannatis ...	1 gr.	600
,, Strophanthi Tinct., 4 m.		678
,, Suprarenal Extract, ½ gr.		799
,, *Trinitrini*, 1-100 gr.	1 or 2	499
Tablets, Compressed—*686.* *Chiefly in demand are:—*		
Acetanilide, 3 gr., and with Caffeine, 1 gr		250
Agathin, 4 gr., 66; Agurin, 8 gr.		692
Aloes et Myrrh = 4 gr. pill (*Off.*)		111
,, 4 gr. et Ferri Sulph. = 4 gr. pill (*Off.*) ...		111
Aloin, 1-10 and ½ gr., 113; Compound		113
Ammon. Bromide, 5 and 10 gr....		116
,, Chloride, 3 & 5 gr. (& 3 gr. with Borax, 2 gr.)		117
Ammonium Chloride, 3 gr. with Liquorice Ext. 3 gr.		117
Anticonstipation = Pil. Aloin Co.		113
Antifebrin, 3 gr. (and with Caffeine, 1 gr.)		250
Antipyrine, 2½ and 5 gr. (and 3 gr. with Caffeine, 1 gr.)		262
Antiseptic, Thymol, Lavender, &c.		
Apomorphine, 1-100 gr. and 1-50 gr.		129
Aristochin	4 and 8 gr.	601
Arsenious Acid, 1-100, 1-50, and 1-20 gr.		142
Aspirin, 5, 8 and 16 gr.		61
Atropine Sulphate, 1-100 gr.		155
Arsenic, 1-60 gr., Iron Hypoph., 2 gr., Quin. Ac. Sulph. 1 gr.		144
Benzoic Acid Compound = Benzoic Acid, ½ gr., Menthol, 1-10 gr., Ipecac., 1-10 gr., Codeine, 1-10 gr., Red Gum, ½ gr.		
Benzonaphthol, 5 gr., 489; Benzosol, 5 gr.		307
Betanaphthol, 3 gr., 488 ;Bismuth Carbonate, 5 gr.		176
Bismuth Salicylate, 5 gr.,179; Subnitrate, 5 and 10 gr.		180
,, and Pepsin, 3 gr. each...		177
,, Pepsin and Charcoal, 2 gr. each		
For Effervescing Compounds see 'Vescettes.'		

NAME.	DOSE.	PAGE
Tablets, Compressed—686. (*Continued.*)		
Blaud's Pill, 3, 4 and 5 gr.	...	338
,, ,, 4 gr. with Arsenic 1-64 gr.	...	338
Boric Acid, 5 gr.	...	11
Butyl-Chloral and Gelseminine HCl.	...	187
Caffeine, 1 gr. and Antipyrin, 3 gr.	...	192
,, 1 gr. and Phenacetin, 4 gr.	...	192
,, Citrate, 2 gr.	...	192
,, Hydrobromide, 2 gr.	...	192
Calcium Sulphide, ¼, ½, 1 gr., 199; Calcusol	...	571
Camphor, ¼ gr. and Quinine Acid Sulphate, 1 gr.	...	203
,, Monobrom, 1 gr.	...	204
Carbolic Acid, ¼, ½ gr.	...	16
Cascara Ext. 1, 2, 3, 4, 5, gr. (plain or sugar-coated)		221
Cerebrin, 5 gr.	...	794
Chinosol, 5, 8 and 15 gr.	...	255
Chloralamide, 5 gr.	...	230
Chloral Hyd., 5 and 10 gr. (*to be dissolved*)	...	229
Cholelysin, 643; Chologen	...	577
Chinaphenin	1½, 4 and 8 gr.	601
Citarin	...16 and 32 gr.	107
Clavin	... ⅓ gr.	324
Codeine, ¼ and ½ gr. (and Phosphate, ¼ gr.)	...	289
Colalin	... ⅛ and ½ gr.	669
,, Laxative 1⅛ gr. with Anthraquinone	...	669
Collargol, 1 gr.	...	137
Colocynth Comp. = 4 gr. pill (*Off.*)		
Comp. Hypophosphites	...	554
Cotarnin	... ¾ gr.	492
Cotarnin Phthalate = Styptol.		
Didymin (Orchitic Substance), 5 gr.	...	797
Digitoxin, 1-250 gr.	319	
Dinner	577	
Diuretin, 5 gr.	693	
Dover's Powder, 5 gr.	446	
Ergotin, 1, 2 and 3 gr.	325	
Eucaine-β, 1-10 gr.	284	
Euonymin, 1-8, ½ gr.	333	
Euquinine, 8 gr.	601	
Exalgin, ½ and 1 gr.	255	
Exodin, 0·5 gm.	222	
Ferri Arsenas, 1-8 gr.	147	
,, Carb. Sacch., 5 gr.	337	
,, Quin. Citr., 3 gr.	591	
Ferrum Redactum, 2 gr.		
Fersan, 0·25 and 0·5 gm.	353	
Formalin Disinfectant	...	109
Glandulen, 4 gr., 809; Gland Suprarenal	...	799
Glycerophosphates. Compound	...	50
Grey Powder, ¼, ⅓, ½, 1, 2, and 3 gr.		
,, 1 gr. and Dover's Powder, 1 gr.		
Guaiacol Benzoate, 5 gr.	...	307
,, Carbonate, 5 gr.	...	308
Guaiacum and Sulphur, 3 gr. of each	...	380
,, ,, 2 gr. with Quin. Salicyl. ½ gr.		
Hedonal, 7½ gr. and 16 gr., 710; Helmitol, 7½ gr.		569
Hetralin, 7½ gr., 569; Hopogan, 0·3 gm.	...	412
Hydrarg. Iodidum Flav., 1-8 gr., 394; Rub., 1-20 gr.		391
,, ,, Vir., 1-8 gr.	...	394
,, Perchlor., 1-100, 1-32 and 1-10 gr.	...	399
,, Subchlor., 1-10, 1-6, ¼, ½, 1, 2, 3, 4 and 5 gr.		402
For Effervescing Compounds see 'Vescettes.'		

NAME.	DOSE.	PAGE
Tablets, Compressed—686. *(Continued.)*		
Ichthyol, 2½ gr. ...	422	
Iodipin, 3 gr.	437	
Iodopyrin, 5 gr. ...	264	
Iodothyrin, 5 gr. ...	807	
Ipecac. Pdr., 1-20, 1-10, ¼ and 5 gr.	445	
Isopral, 4 and 8 gr. ...	227	
Kermetis, P. Belg. 0·01 Gm.	127	
Lecithin, 1-3 gr. ...	459	
Lithium Carb., 5 gr. ...	461	
,, Citrate, 5 gr.	461	
Livingstone Rousers ...	600	
Lycetol, 16 gr.... ...	567	
Magnes. Sulphite, 5 gr.	70	
Manganese Diox., 2 gr.	469	
Maretin, 4 and 8 gr. ...	251	
Mercur. Ethyl-diamin	388	
Metakalin, 15 gr. ...	17	
Nitropropiol (Sugar Test)	846	
Nuclein, 1 gr.	224	
Nux Vomica Tinct., 5 and 10 m.	503	
Opium Powder, ½, 1 gr.	525	
Orexine Tannate, 4 gr.	260	
Orchitic Subst., 5 gr....	797	
Ovarian Subst., 5 gr....	797	
Ox Bile, keratined, 5 gr.	334	
Pancreatin and Soda ...	529	
Pankreon	532	
Papain, 2 and 5 gr. ...	534	
Pelargonium Compound	745	
Pepsin, 3 gr.	546	
Peptonic (Pepsin, Pancreatin, Calcium Lactoph., each 1 gr.)		
Phenacetin, 4, 5 and 10 gr.; 4 gr., with Caffeine, 1 gr.	261	
,, 2½ gr., and Sulphonal, 2½ gr.	261	
Phenalgin, 2½ gr.	251	
Phenolphthalein, ½, 2 and 4 gr.	24	
Piperidine Para-Sulphamine Benzoate, 5 gr.... ...	571	
Piperazine, 5 and 15 gr.	566	
Pilocarpinæ Nitratis, 1-10 and 1-6 gr....	452	
Podophyllin, 1-8, ¼, and ½ gr.	576	
Potass. Bicarbonate, 5 gr.		
,, Bromide, 5 and 10 gr.	579	
,, Chlorate, 5 gr.	580	
,, ,, 3 gr., with Ammon. Chlor. 1 gr., with Borax, 2 gr., and with Borax and Cocaine	580	
Potass. Iodide, 5 gr.	583	
,, Permanganate, 1, 2 and 3 gr.	472	
Pulv. Cretæ Aromat., 5 gr., and with Opium... ...	524	
Quinine Acid Sulph., ½, 1, 2, 3, 4, and 5 gr.	600	
,, Hydrobromide, 3 and 5 gr.	592	
,, ,, 3 gr. with Phenacetin 5 gr.	592	
,, Hydrochloride, 1, 2, 3, 4, and 5 gr.	593	
,, ,, Acid, 1, 3, and 5 gr.	593	
,, Salicylate, 3 gr.	596	
,, Sulph., 1, 2, 3, 4, & 5 gr.	598	
Red Bone Marrow, 3 gr. = 1 gr. Desiccated Marrow	793	
Rennet, 543; Resorcin, 3 gr.	630	
Rhubarb, 3 gr., and Compound (Gregory Powder), 5 gr.	633	
,, Soda and Ginger	633	
Saccharin, ½ gr., 637; Salicin, 5 gr.	63	
Salicyl-Acetic Acid, 5, 8 gr., 61; Salipyrin, 5 gr. ...	265	
Salol, 5 gr., 63; Salophen, 8 gr., ...	66	
Saloquinine, 1½, 4 & 8 gr., 62; Santonin, 1, 2 & 3 gr.	640	
Saxin (Saccharin) ... ... ¼ gr.	637	
Sidonal, and New ... ... 7½ gr. each	568	
Soda Mint (Sod. Bicarb., Am. Carb., & Peppermint)		
Sodii Acid Sulph., 664; Benzoate, 2 gr.	5	
,, Bicarb., 5 gr.; Bromide, 5 gr.	656	
,, Chlor. and Borax 658; Citrate, 5 and 10 gr. ...	659	

For Effervescing Compounds see 'Vescettes.'

NAME.	DOSE.	PAGE
Tablets, Compressed—686. (*Continued.*)		
,, Fluorescein, $\frac{1}{256}$ gr., 256; Nitrite, 2½ gr.	...	661
,, Salicyl., 3 & 5 gr., 60; Solurol, 4 gr.	... ...	805
Spinal Cord, 2½ gr., 795; Spleen Substance, 5 gr.	...	798
Strontium Brom., 5 gr.	... ...	675
Strophant. Tinct., 2 & 5 m.	... ...	678
Strychnine Sulphate, 1-60, 1-50, 1-30 gr.	... ...	681
Stypticin, ¾ gr., 492; Styptol, ¾ gr.	... ...	492
Sublamin (poison), 15 gr., 388; Sulphonal, 5, 8 & 16 gr.		682
Sulphur Præcip. 5 gr., with Pot. Acid. Tart., 1 gr.	...	685
Supra-renal Capsule, 5 gr.	... ...	799
Syr. Easton = ½ dr. & 1 dr., 349; Tetronal, 5 gr.	...	683
Tannigen, 8 gr.	... ...	72
Theocin, 4 gr. & Theocin Sodium Acetate, 1½ & 4 gr.		693
Theophylline, 4 gr., 693; Thyminic Acid, 4 gr.	...	805
Thymol Carb., 10 gr., 701; Thymus Gland, 3 & 5 gr.		804
Thyroid Pdr., 1½ & 5 gr., 807; Thyroglandin, 2 gr.		807
Thyro-iodin, 0·3 gm.	... ...	807
Tinct. of Aconite, 5 m., 80; Bellad., 2 & 5 m.	...	174
,, Cannab. = 5 m., 205; Opium, 5 & 10 m.	...	526
Trional, 5, 8 & 16 gr., 683; Trunecek's Serum	...	654
Tylmarin, 5 gr.	... ...	32
Uranin, 256; Uranium Nit., 1 gr.	... ...	707
Urethane, 5 gr., 710; Uricedin, 15 gr.	... ...	462
Urosin, 8 gr.	... ...	590
Urotropine, 3, 5, & 7½ gr.; Effervescent, 4 gr.	...	569
Veronal, 5, 7, 10, & 15 gr., 709; Vesalvine, 5 gr.	...	569
Yohimbine HCl., 1-13 gr.	... ...	754
Zinc Oxide, 2 gr., 718; Zymine, 3 gr.	... ...	
Tablets, Hypodermic, 689. *Chiefly in demand are:—*		
Sterile Capsules of Distilled Water for dissolving, see p. 161.		
Aconitine Nitrate, 1-640 gr.	... ...	77
Adrenalin, 1-300 gr., with Cocaine Hyd. 1-6 gr.	...	802
Apomorph. Hydrochlor., 1-20, 1-15 and 1-10 gr.	...	129
Atropine Sulph., 1-200, 1-150, 1-100, 1-60 and 1-50 gr.		156
Beta-Eucaine, ¼, 1-3 and 1 gr.	... ...	282
Caffeine Sodio Salicylate, ½ gr.	... ...	193
Clavin, 1-3 gr.	... ...	324
Cocaine Hydrochlor., 1-10, 1-8, 1-6, ¼, and ½ gr.	...	275
Codeine Phosphate, ¼ gr.	... ...	289
Curare, 1-12 gr.	... ...	314
Digitalin (soluble), 1-100 gr.	... ...	318
{ Digitalin, 1-100 gr. / Strychnine Hydrochlor, 1-60 gr. }		
Ergotinine Citrate, 1-200 and 1-100 gr.	... ...	325
Heroin Hydrochloride, 1-24, 1-12 gr.	... ...	485
Homatropine Hydrobromide, 1-250 and 1,200 gr.	..	161
Hydrargyri Perchloridi, 1-60, 1-50 and 1-30 gr.	...	399
Hyoscine Hydrobrom, 1-200, 1,100 and 1-75 gr.	...	416
Hyoscyamine Sulphate, 1-100, 1-50 gr.	... ...	420
Morphine Bimec. 1-8 and ¼ gr.	... ...	482
,, Hydrochlor. 1-6, ¼, ½ and 1 gr.	...	481
,, Sulphate, 1-8, 1-6, ¼, ⅓, ½, and 1 gr.	...	482
,, Sulph. with Atropine Sulph. (all strengths)		482
Morphine Tartrate, 1-8 and ¼ gr.	... ...	483
Nitroglycerin, 1-100 and 1-250 gr.	... ...	497
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NAME.	DOSE.	PAGE
Tablets, Hypodermic—689. (*Continued.*)		
Physostigmine Salicyl., 1-500 gr.		558
Picrotoxin, 1-100 gr.		
Pilocarpine Hydrochlor, 1-6 gr.		451
,, Nitrate, 1-10, 1-8, 1-6, ¼, 1-3, and ½ gr.		452
Quinine Hydrobromide, ½ gr.		592
,, Hydrochloride Acid, 1, 2 and 3 gr.		593
Sclerotic Acid, 1-16 gr.		326
Sparteine Sulphate, ½ gr.		670
Strophanthin, 1-500 gr.		678
Strychnine Nitrate, 1-100, 1-60, 1-40 and 1-20 gr. ...		680
,, Sulphate, 1-100, 1-60, 1-50 and 1-30 gr. ...		681
Tropacocaine, 1-30 gr.		281
Tablets, Ophthalmic. (*Vide also Ophthalmic Discs.*		
Homatropine Hydrobromide, 1-400 and 1-40 gr. ...		161
,, 1-250 gr. with Cocaine Hydrochloride, 1-25 and 1-50 gr. of each		161
Tablet Triturates		688
Tachiol, 131: Tænia, 639; Tæniacides		351
Taka-diastase	1 to 5 gr.	469
Talc (and Talcum Purificatum, U.S.)		456
Tallquist's Hæmoglobin Scale		833
Tamarind (and U.S.)	1 to 8 dr.	
Tanacetum (Tansy)		751
Tannalbin, 8 to 15 gr., 72; Tannigen ...	3 to 8 gr.	72
Tannin, 2 to 5 gr., 71; Tannin Albuminate		72
,, Iodine Syrup, ½ to 2 dr., 439; Wool		72
Tannoform, 73; Tanocol	15 gr.	72
Taphosote, 20 to 40 gr., 305; *Tar*	2 to 10 gr.	571
Taraktogenus		510
Taraxacum (U.S. 120 gr.)		751
,, Cocoa	1 tablespoonful	751
Tasteless Purging Salt...		662
Taxine (Taxus Baccata)	1-100 to 1-60 gr.	752
Taylor's Anti-epileptic Medicine		228
Teinture Ethérée de Phosphore		548
Tela Depurata, 378; Vesicatoria, 209; Tenaline, 728;		
Tenax		378
Terebenum	5 to 15 m.	689
Terebinthina Canadensis, 752; Chia... ...	5 to 10 gr.	691
Terpineol and Terpilenol		690
Terpinol (and Fluid, Mackey)...	1 to 5 m.	690
Terpinum Hydratum	2 to 6 gr.	690
Testicle Juice, Testiculin, Testin		797
Tetanus Antitoxin, 778; Dry as Wound Dressing...		779, 780
,, ,, Intra-cerebral Injection of		781
Teucrium Scordium	10 to 20 gr.	752
Tetrahydroparamethyloxychinoline Sulphate	3 to 5 gr.	267
Tetra-iodo-pyrrhol, *syn.* Iodol	1 to 3 gr.	432
Tetra-iodofluorescein		78
Tetramethylthionine Chloride	1 to 4 gr.	258
Tetra-oxy-phthalophenon Anhydride		256
Tetronal	10 to 20 gr.	683
Thalassine...		804
Thalline Sulphate (Bougies, &c.)	3 to 5 gr.	267
Thalleioquin, 590; Thapsia Garganica		752

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Thebaine, 288, ***492***; Theine	1 to 5 gr.	188
Theobroma Emulsion, 687; Ether-Alcohol Solution ...		687
Theobromatis Oleum and Pasta		691
Theobromine	1 to 5 gr.	188, 692, 850
,, Sodio-Sodic Acetate ...	7½ to 15 gr.	692
Theobrominum Natrio-Salicylicum	5 to 15 gr.	693
Theocin, 3 to 6 gr., 693; Sodium Acetate ...	5 to 8 gr.	693
Theophylline, 3 to 6 gr., 693; Sodium		693
Therapeutic Index		1011
Thermiol, 28; Thermo-isolators		414
Thermodin, 5 to 15 gr., 267; Thermofuge		372
Thermometric Equivalents		893, 894
Thialion, a teaspoonful in hot water, 462; Thigenol ...		424
Thiocol, 15 gr., 310; Thioform		180
Thiol (and Liquidum) and Preps.	2 to 10 gr.	424
Thionin Solution, 881; Thio-Resorcin		632
Thiosinamin Plaster and Soap, 651, 652; Thomas' Developers		604
Thoma-Zeiss Hæmacytometer...		834
"Thoriac" (Registered Trade Mark)		695
Thorii Hydroxidum		695
,, Camphor Sulphonas, Cinnamas, Orthocoumaras, Glycerophosphas, and other Salts	1 to 5 gr. (?)	696
,, Lactas, Oleas, Quinas, Salicylas, Sulphocarbolas, Uras	1 to 5 gr. (?)	697
Thorium, 694 *et seq.*; Emanation in Phthisis		698
,, Nitrate, 695; Pads		698
Threadworm		639
Throphleol, 328; Thuja		752
Thymaglycine	1 to 2 dr.	700
Thymol	½ to 2 gr.	698
,, Carbonate (and Tablets of)	5 to 15 gr.	701
,, Gauze		701
,, Iodide, U.S. = Aristol		431
,, Solution (Volckmann's)		700
,, Wool		701
Thymolin, 700; Thymotal	5 to 15 gr.	701
Thymus Gland (Liq. Ext., ½ to 2 dr.) ...	3 to 10 gr.	804
Thyro-glandin	3 to 5 gr.	807
Thyroid Anti-Serum, 808; *Thyroid Solution*	5 to 15 m.	806
Thyroidectine	5 gr.	809
Thyroideum Siccum	3 to 10 gr.	806
Thyro-iodin, 807; Tick Fever		781
Tillman's Dressing		378
Tinctura Aconiti	...5 to 15 m., or 2 to 5 m. repeatedly	79
,, ,, (Fleming and Turnbull) ...	1 to 5 m.	80
,, *Actæa*	30 to 60 m.	240
,, *Adhatodæ*	30 to 60 m.	xxiii
,, Æsculi Hippocastani	... 10 m.	725
,, *Aloes* ...	1½ to 2 dr., or ½ to 1 dr. repeated	111
,, ,, P.G. iv. (1 to 5 Alc. 90%) ...	5 to 15 m.	
,, ,, Composita, P. Austr. ...	1 to 2 dr.	112
,, et Myrrhæ, U.S.	30 m.	112
,, *Alstoniæ Constrictæ*... ...	5 to 20 m.	xxiii, 726
,, ,, *Scholaris*	½ to 1 dr.	xxiii, 726
,, Amara, P.G.		737
,, Ammoniæ Composita, P.L....		120
,, *Andrographidis*	½ to 1 dr.	xxiii

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Tinctura Anodyna	5 to 30 m.	526
,, Anthemidis	3 to 10 m.	727
,, Anthoxanthi	2 to 6 m.	727
,, Antiperiodica	1 to 4 dr.	599
,, Apis Mellificæ	1 m. hourly	728
,, Apocyni Cannabini	5 to 60 m.	128
,, *Aristolochiæ*	½ to 1 dr.	xxiv
,, *Arnicæ*	½ to 1 dr.	
,, ,, Florum, U.S.	½ to 1 dr.	xxiv
,, *Asafetidæ*	½ to 1 dr.	728
,, *Aurantii*	½ to 1 dr.	164
,, *Azadirachtæ Indicæ*...	½ to 1 dr.	xxiv
,, Baptisiæ	5 to 30 m.	729
,, *Belladonnæ*	5 to 15 m.	174
,, ,, Ætherea		174
,, *Benzoini Composita*	30 to 60 m.	112
,, ,, Simplex, B.P.C. 1 in 10		112
,, *Berberidis*	½ to 1 dr.	xxiv
,, Blattarum Orientalium		730
,, Boldoæ	10 to 20 m.	730
,, Bryoniæ	1 to 10 m.	730
,, *Buchu*	½ to 1 dr.	186
,, Cacti Grandiflori	2 to 10 m.	732
,, Calendulæ Florum	5 to 20 m.	200
,, *Calotropis*	½ to 1 dr.	xxiv
,, *Calumbæ*	½ to 2 dr.	731
,, *Camphoræ Composita* ...	30 to 60 m.	525
,, *Cannabis Indicæ*	5 to 15 m.	205
,, *Cantharidis* 5 to 15 m., or 2 to 5 m. repeated		208, 209
,, *Capsici*	5 to 15 m.	215
,, ,, Ætherea		215
,, ,, Concentrata (Turnbull)		215
,, ,, Fortior, B.P.C.	1 to 3 m.	215
,, Cardamomi, U.S., 1 dr., and *Composita* (*Off.* and U.S.)	½ to 1 dr.	731
,, Carminativa	2 to 10 m.	723
,, Cascara Sagrada	10 to 60 m.	222
,, *Cascarillæ*	½ to 1 dr.	732
,, Castorei	½ to 1 dr.	
,, *Catechu*	½ to 1 dr.	732
,, Cedron...		750
,, Chinæ		243
,, ,, Composita Whytii		243
,, *Chiratæ*	½ to 1 dr.	734
,, Chloroformi Composita	5 to 60 m.	238
,, ,, *et Morphinæ Composita*	5 to 15 m.	237
,, *Cimicifugæ*	30 to 60 m.	240
,, *Cinchonæ* and *Composita* ..	½ to 1 dr.	243
,, *Cinnamomi* (Composita, P.L., 723)	½ to 1 dr.	245
,, *Cocci*, as colouring	5 to 15 m.	218
,, *Colchici Seminum*	5 to 15 m.	290
,, Collinsoniæ...	½ to 2 dr.	735
,, Colocynthidis, P.G.	3 to 15 m.	296
,, *Conii*	30 to 60 m.	299
,, Convallariæ	5 to 20 m.	300
,, Coronillæ	30 to 60 m.	735
,, *Coscinii*	½ to 1 dr.	xxv

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Tinctura	Coto	10 to 30 m.	301
,,	*Croci*, as colouring	... 5 to 15 m.	735
,,	*Cubebæ*	½ to 2 dr.	311
,,	*Digitalis*	5 to 15 m.	317
,,	Droseræ Rotundifoliæ ...	... 5 to 10 m.	736
,,	Elaterii Composita	10 to 30 m.	320
,,	Ergotæ	... 5 to 30 m.	323
,,	,, *Ammoniata*	30 to 60 m.	325
,,	Erythrophlœi...	... 5 to 10 m.	327
,,	Eucalypti Foliorum... ...	15 to 120 m.	330
,,	,, Gummi	20 to 40 m	333
,,	Euonymi...	...10 to 40 m.	333
,,	Euphorbiæ Piluliferæ ...	... 10 to 30 m.	334
,,	Ferri Acetatis	... 5 to 30 m.	345
,,	,, Chlorati Aetherea, P.G.	... ...	341
,,	,, Chloridi...	... ... 8 m.	341
,,	,, Muriatis	...10 to 30 m.	341
,,	,, *Perchloridi*	... 5 to 15 m.	340
,,	,, Pomata	...15 to 30 m.	344
,,	,, Sesquichloridi	...10 to 30 m.	341
,,	*Gallæ*	...½ to 2 dr.	
,,	Gambir Composita	... ... 1 dr.	732
,,	*Gelsemii*	... 5 to 15 m.	365
,,	*Gentianæ Composita* ...	...½ to 1 dr.	
,,	Gossypii Radicis	... ... 1 dr.	379
,,	Grindeliæ	... 1 to 2 dr.	379
,,	Guaiaci, 1 in 10 (Blood Test), 833; U.S., 1 in 5		380
,,	,, *Ammoniata* ...	...30 to 60 m.	380
,,	Guaranæ	...30 to 60 m.	381
,,	Gummi Rubri	...20 to 40 m.	333
,,	*Hamamelidis*	...30 to 60 m.	384
,,	*Hydrastis*	...30 to 60 m.	408
,,	*Hyoscyami*, 1 in 10 alc. 45%, U.S. alc. 48·9%,	30 to 60 m.	418
,,	Ignatiæ...	... 3 to 20 m.	503
,,	*Iodi* (P. Ed., 1 in 16, 440) ...	... 2 to 5 m.	440
,,	,, Ætherea, 440; Decolorata, 440; Oleosa ...		441
,,	Ipecacuanhæ (et Opii, U.S., 8 m., 446) ...	10 m.	447
,,	*Jaborandi*, 1 in 5	30 to 60 m.	450
,,	*Jalapæ* (*and Composita*, xxviii)	...30 to 60 m.	455
,,	*Kaladanæ*	½ to 1 dr.	xxvi
,,	*Kino*	30 to 60 m.	458
,,	Kolæ	... 20 to 60 m.	190
,,	Koromiko	½ to 1 dr.	740
,,	*Krameriæ*	30 to 60 m.	458
,,	Lachnanthis	... 1 to 10 m.	740
,,	Lactucarii, U.S., 1 in 2 ...	Average 30 m.	419
,,	Laricis	... 20 to 30 m.	
,,	*Lavandulæ Composita* ...	...30 to 60 m.	741
,,	Laxativa	...20 to 60 m.	222
,,	*Limonis*...	...30 to 60 m.	
,,	Lobeliæ, B.P. 1885, 10 to 30 m. (U.S., 15 m.—1 dr.)		741
,,	*Lobeliæ Ætherea*	... 5 to 15 m.	741
,,	*Lupuli*, 30 to 60 m.; Lupulinæ	...10 to 60 m.	462
,,	Lycopodii	15 to 60 m.	463
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,, *Nucis Vomicæ*	... 5 to 15 m.	503
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,, *Oliveri Corticis*	... ½ to 1 dr.	xxvii
,, *Opii* ...	20 to 30 m., or 5 to 15 m. repeated	525
,, *Opii Ammoniata*	30 to 60 m.	526
,, ,, Camphorata	U.S. aver. 2 dr.	525
,, ,, Crocata	... 5 to 20 m.	526
,, ,, Deodorata	U.S. aver. 8 m.	526
,, Phosphori Composita ...	... 3 to 12 m.	551
,, Physostigmatis	... 5 to 15 m.	557
,, Phytolaccæ	... 3 to 10 m.	745
,, *Picrorhizæ*	... ½ to 1 dr.	xxvii
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,, Podophyllin Ammoniata ...	...10 to 20 m.	577
,, *Pruni Virginianæ*	30 to 60 m.	587
,, Pulsatillæ	1 to 5 m. increased	588
,, *Pyrethri*, 1 in 5 alc. 70 %		746
,, *Quassiæ*	30 to 60 m.	747
,, Quebracho	30 to 60 m.	589
,, *Quillaiæ*...	30 to 60 m.	747
,, *Quininæ*, 2%	30 to 60 m.	593
,, ,, *Ammoniata*, 2% ...	30 to 60 m.	599
,, *Rhei Composita*...2 to 4 dr., or ½ to 1 dr. repeated		634
,, ,, Aquosa, & Vinosa, P. Aus. ...	1 to 2 dr.	633
,, ,, Aromatica	Average 30 m.	634
,, Rhois	... 2 to 15 m.	634
,, Rumicis...	... 1 to 10 m.	635
,, Sanguinariæ (U.S. aver. 15 m.)	...30 to 60 m.	639
,, *Scillæ*	... 5 to 15 m.	749
,, Scopolæ	... 5 to 30 m.	749
,, Senecionis	... 1 to 2 dr.	749
,, *Senegæ*	30 to 60 m.	750
,, *Sennæ Comp.* 2 to 4 dr., or ½ to 1 dr. repeated		649
,, ,, Leguminorum, 2 to 4 dr. or ½ to 1 dr.		649
,, *Serpentariæ*	30 to 60 m.	750
,, Spigeliæ, U.S., 1890		
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,, *Sumbul*	30 to 60 m	751
,, Thujæ	... 2 to 5 m.	752
,, *Tinosporæ*	½ to 1 dr.	xxviii.
,, *Tolutana*	30 to 60 m.	729
,, *Urgineæ*	... 5 to 15 m.	xxix
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,, Benzoici Compositi T.H. (Benzoic Acid, Codeine, Cocaine, Ipecac, Menthol and Red Gum) (marked C.B.A.)		
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,, Gallic, ½ gr. S.		
,, *Tannici*, F., ½ gr. and G. ...	1 frequently	
,, Tannici, F. 1½ gr., T.H. (marked T.)		
,, Tannici et Capsici, F.	1 frequently	
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,, Chloratis, F., 3 gr., T.H. (marked P.)	...	
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,, Chlor. et Glycerin, G., 3 gr.	1 every 3 hours	
,, Nitratis, S., 3 gr.	... ... 3 to 6 daily	
,, Tartratis Acidi, F., 3 gr.	... 3 to 6 ,,	
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,, Citrate	15 gr.	580
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,, Salicylate	5 gr.	60
,, Sulphate = 30 grs. of the Salt.		
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,, *Antimoniale*, 1 in 220, 10 to 30 m.; emetic	2 to 4 dr.	12
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,, ,, Amarum, U.S.	... ... 2 dr.	343
,, ,, *Citratis*	... 1 to 4 dr.	343
,, ,, Glycerophosphatis ...	... ½ to 2 oz.	48
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THERAPEUTIC INDEX OF DISEASES AND SYMPTOMS.

N.B.—Internal Remedies are in Roman type. *Those for local or external use are in italics in a separate paragraph.*

Some of the Articles new to this Edition, to which special attention is directed, are printed in the reverse manner, *i.e.*, Internal Remedies in *italics*, and the ones used externally and locally in Roman.

Abortion, Threatened.—Codeina, Hydrastis, Morphina, Opium, Sumbul, Quinine, Viburnum prunifolium.

Abscesses, general, to abort.—Aconite, Belladonna, Calcium Sulphide, Veratrum.

Acid. Carbolic, Argenti Nitras, Hydrogen Peroxide, *Tincture of Iodine, Unguentum Belladonnæ*, Ung. Iodi Intinctum, Di-iodo-iso-Propyl Alcohol.

Abscesses, Dental.—*Boric Acid Lotion, Dental Solubes*, Iodates, *Lysoform.*

Acidity of Stomach.—Aqua Calcis, Ammonia preps., Bismuth preps., Calcii Carbonas, Carbo Ligni, Cerium Salts, *Cremor Magnesiæ*, Magnesii Carb. or Oxide, Potass Bicarb., Sodii Bicarb.

Acne.—Arsenic, Cassia Beareana, Calx Sulphurata, Guaiacol, Hypophosphites, *Levurine Injection*, Liquor Auri et Arsenii Bromidi, Liquor Auri et Hydrarg. Bromidi, Ol. Morrhuæ, Phosphorus, Potassii Bromid., Quininæ et Ferri Citras, Sodii Bromid., Sulphur, Viola tricolor, Yeast.

Acid. Carbolic, Acid. Lactic, Acid. Nitric. stabs., Calaminæ Lotio, Chielin, Glycerinum Kaolin Aceticum, *Hydrarg. Perchlorid. Lotio, Ichthyol, Ichthyol-resorcin and Salicylate*, Iodates, *Lotio Sulphuris cum Sapone*, Quillaia Lotion, *Resorcin, Sulphur Ung., Sulphur. Hypochloritis Ung., Sulphur. Iodid. Ung., Thymol Ung.*

Acne Rosacea.—*Finsen Light and 'X' rays.*

Actinomycosis.—Potassii Iodid., or better Sodii Iodid., Salicylates.

Argent Colloidale, Iodi Injectio, Sol. Argent. Nit. Injectio 20%, Cupri Sulphas, *'X' Rays.*

Addison's Disease.—Preparations of Arsenic, Iron, Phosphorus, and of the Suprarenal Capsules.

Adenoids.—Cod Liver Oil, Iodine, Iron, Syrup Iodo-Tannicus.

Ammon. Chlor. Snuff, Glycerin, Liquor Ferri Perchlor., Nasal Injection of Tannic Acid, Nebulæ (*q.v.*).

Ague.—Acid. Salicylic and Salicin, Ammon. Chlorid., Aritochin, Arsenic, Berberina, Chinolinum, Cinchonidinæ Sulpha Cinchonina, Digitalis, Eucalyptus Globulus, Eupatorium Hydrastis, Livingston Rousers, Methylene Blue, Phenalgin Piperina, Quinetum, Quinidinæ Sulph., *Quinine Arrhenalat* Quininæ Sulph. and Hydrobrom., Salicylates, Saloquinin Simaba Cedron, Sodii Hyposulph., Urea, Warburg's Tincture

Albuminuria.—Acid. Gallic., Ferri Cacodylas, Fuchsin Jaborandi and Pilocarpine, Juniper Oil, Nitroglycerin Nitrites of Amyl and Sodium, Ozonic Ether, Strontii Lacta and purgatives.

Alcoholism.—Ammonium Chloride, Arsenic, Atropina Auri Chlorid., Cactus, Capsicum, Chloral Hydras, Cinchon rubra, Digitalis, Hydrastis, Hyoscinæ Hydrobromidum, Hyoscyamus, Stramonium, Lupulin, *Mistura Antidipsomanica* Mistura Ferri Aperiens, Mistura Magnes. Sulph. Co., Nux Vomica, Phosphorus, Picrotoxin, *Pilulæ Capsici Co.*, Quinin Preps., Strychnine, Zinc preps. See also B.M.J. i. /05,951.

Alopecia.—Arsenic, Iron, Pilocarpine, Strychnine. *Ammon. Liquor*, Amyl Nitrite and Pilocarpine Hair Lotion *Captol*, *Cantharides preps.*, *High Frequency current*, *Hydrargyri Oleas*, *Hydrargyri Oleas*, *Hydrargyri Perchlor.*, *Lin. Iodi Lotio Capillaris*, *Chrysarobin*, *Lotio Resorcini*, *Oxygen. Petroleum Spirit*, *Pilocarpine Nitrate Lotion*, Spiritus Acid. Lactic

Amenorrhœa—Actæa and Cimicifugin, Aloes, Apiol Arnica, *Cantharides*, Caulophyllin, *Dewees's Mixture*, Ergota Ergot and Apiol Capsules, *Eupatorii Inf.*, Gossypii Rad. Cortex Guaiacum and Apiol, Iron Salts, Manganesii Oxidum, Menyanthes, *Nickel Phosphas and Sulphas*, Ol. Rutæ, Pulegium Pil. Aloes et Myrrh, Potass. Permang., Pulsatilla, Savin Senecio, *Tanacetum*.

Analgesics = Anodynes.—Acetanilide, *Alypin*, Atropine, Belladonna, Butyl Chloral, Camphor, Cannabis Chloretone, Cocaine, Codeine, Conium, *Eucaine*, Gelsemium Hyoscyamus, Hyoscine, Hypnal, Lupulus, Morphine, Opium Orthoform, Phenacetin, Phenazone, *Stovaine*.

Anæmia.—Alginoid Iron, Arsenic, Arsen-Hæmol, Bromo Hæmol, Cacodylates, Calcii et Ferri Glycerophosphas Calcii Hypophosph., Calcii Phosph., *Capsulæ Cruoris*, Ferratin Ferri Bromid., Ferri Perchlorid. Liquor, Ferri Hypophosph. Ferri Iodidum, *Ferri Oxalas*, Ferri Perchlorid., *Food Preparations* (*new*, *various*), *Glycerol Glycerophosphatum*, Ferri Phosph., Ferri Sulph., Ferrum Dialysat., Ferrum, Redactum *Glycerol Glycerophosphatum cum Medulla rubra*, Hæmoglobin preps. and Capsules, Hæmatogen, Hydrogen Peroxide, Levico Water (mild and strong), Liquor Ferri Albuminati, Liquor Ferri Peptonati, Liquor Ferro-Manganesii Peptonati, Magnesii Peroxidum, Maltolivine, Manganese Citrate, Marrubin *Malted Glycerophosphates*, Nucleinic Acid, Phosphorus, Pil Ferri Carb., Pil. Ferri Sulph., Quinine preps., Quinin et Ferri Chlor., Sicco, Sodii Hypophosphis, Somatose, *Syr. Iodo Tannicus*, *Syrupus Tann-Iodo Phosphoratus*, *Syrupus Trium* ***Phosphatum***, **Tinctura Ferri Pomata**, *Vinum Tann-Iodi* ***Phosphoratus***.

Anæsthetics by inhalation.—A.C.E., Æther, Æthyl, Bromid. C.E., Æthyl Chlorid., Æthyl Iodid., Anestile, Chloroform (*and with Oxygen*), Ethyl Chloride with Nitrous Oxide combined), Methylene, Nitrous Oxide, Somnoform.

Anæsthetics, Local.—*Æther, Acid. Carbolic*, Adreucaine, *Æthyl Chlorid.*, Alypin, *Anestile, Anæsthesine, Cocaine, Eucaine, Eudrenine*, Erythrophlæinæ Hydrochloridum, *Eusemin, Holocaine, Ice, Menthol, Methyl Chloride, Narcyl*, Novocain, *Orthoform, 'New' Orthoform, Nirvanin, Stovaine, Tropacocaine, and Tropacocaine Infiltration and Spinal Injection, Morphine and Scopolamine Infiltration, Magnesium Sulphate Intraspinal Injection.*

Anal Fissures. -*Belladonna Ointment, Carbolic Acid*, Glycerin Aloes, *Ichthyol, Iodoform Suppositories, Ung. Conii.*

Ankylostomiasis (caused by Ankylostomum duodenale). —*Eucalyptus Oil*, Filix Mas, Pelletierine, Podophyllin, Terpine, Thymol, *Thymol Carbonate.*

Aneurism.—Aconite, Amyl Nitris (?), Calcii Chlorid., Digitalis, Ergotina, Morphine, Nitroglycerin (?), Potassii Iodidum, Veratrum.
Gelatin Injection.

Angina Pectoris.—Aconite, Æther, Æthyl Iodid., Alcohol, Amyl Nitris, Arsenic, Barium Chloride, Cactus, Digitalis, Erythrol Nitrate tablets, Hoffmann's Anodyne, Isobutyl Nitris, Mannitol Nitrate tablets, Morphinæ inj. hypod., Nitroglycerini Liquor and Tabellæ, Phenazone, Sodii Nitris, Theobromine, Theobromine Sodium Salicylate.

Anorexia.—Calumba, Capsicum, Cascarilla, Chimaphila, Chiratta, Cinchona preps., Gentian, Ignatia, Nux Vomica, Orange, Orexine Tannate, Quassia, Quinine, Strychnine.

Anthrax.—Acid. Carbolic, *Blepharis Capensis*, Calcii Sulphid., Ichthalbin, Phosphorus, *Sclavo's Serum.*
Carbolic, Creolin, and Cyanide dressings; *Iodoform.*

Anthelmintics.—See **Parasites, Intestinal.**

Antidotes are now fully referred to in the text; see also list of *Emetics.*

Antipyretics. See **Fever.**

Antiseptics for Wounds.—*Acid. Boric. Lotio and Ung., Acid Carbolic. Lotio and Ung., Acid. Salicylic. Lotio and Ung., Alcohol 75% (steriliser of skin), Alembroth gauze, Alsol. Aluminii Acet. Lotio, Aristol, Benzoin. Co. Tinct., Chartazinc, Collodium, Dermatol, Epidermin, Europhen, Hydrarg. Biniod., Hydrarg. Perchlor. Lotio, Hydronaphthol Glycerinum Iodoformi, Ichthargan, Iodoform, Iodoformi Emuls., Iodoform Wool and Ung., Iodol, Itrol, Izal, Kresolum, Lanoline, Liq. Hydrogen. Peroxidi., Listerine, Lysoform, Mercuro-Zinc Cyanide, Perchloride Solubes, Petrolei Cerat., Potass. Permang., Resorcin, Salol, Salufer, Sanitary Wood Wool Wadding, Sanoform, Solutol, Solveol, Sozal, Sphagnum, Thymol, Traumatol, Trikresol, Zinci, Chlorid., Zinci Sulphatis Lotio, Zinci Sulphis*, Allmatein, Cheatle's Paste, Metakalin, Iodic Acid, and Iodates. Rubber Glove Substitute, Velvril, Iodoform Bone Plugging, *Vioform, Ecthol, Proteol.* See also **Dressings Sterilised.**

Antiseptics, Intestinal.—Acid. Boric, Acid. Carbolic, Benzonaphthol, Bismuth Salicylate, Bismutose, Ichthyol, Ichthoform, Mercurials, Myrtillus, Naphthalene, Naphthol, Phenol-Bismuth, Quinine Salicylate, Salacetol, Salol, Sulphol-carbolates, *Acid Iodic*, Koumiss, *Tylmarin*.

Antiseptics, Urinary. — Benzoic and Boric Acids, Salol, Hexamethylenetetramine, Methylene Blue, see also Cystitis, *Acid Iodic* and *Iodates*, *Tylmarin*.

Antispasmodics. — See **Asthma, Convulsions and Epilepsy.**

Aphthæ. — Bismuth preparations, Potass. Chloras, Mineral Acids, Quinine preps., Sodii Chloras, Iodoform, Pastils, Pepsin.

Acid. Boric, Acid. Sulphuros, Alumen, Borax, and Glyc. of, Iodol, Lotio Nigra et Glycerini, part. æq., Potass. Permang., Sodii Chlorinat. Liquor.

Appendicitis. — Combined use of Belladonna and Salicylates (*see* p. 174), Opium.

Arteriosclerosis. — Adrenalin, Benzoates, Citrates, Peptone, *Sajodin*, Sodium Hyposulphite, Sodium and Magnesium Sulphates, *Syrupus Iodo-Tannicus*, Thyroid preps.; Depressor Agents, *e.g.*, Chloral Hydrate, Hippurates, *Leucin*, Potassium Iodide, *Nitrites*.

Arthritis.—See **Gout and Rheumatism.**

Asthma.—Æthyl Iodid., Ammon. Brom., Amyl Nitris, Anilin Sulphate, Antimony, Arsenic, Belladonna, Bromides, Caffeine, Cannabis, Cannabin Tannas, Chloral Hydras, Chloroform, Coca and Cocaine Salicylas, Codeine, Erythrol Nitras, Euphorbia pilulifera, Grindelia, Hyoscine, Isobutyl Nitris, Jaborandi, Lobeliæ Tinct. and Tinct. Ætherea, *Mannitol*, Nitro-glycerin, Physostigma, Pilocarpine, Potass. Iodidum, Pyramidon, Quebracho, Sodii Nitris, Stramonium, *Tabellæ Antiasthmaticæ*.

Acid. Sulphuros. Vapor, Ammonii Bromidi Vapor, Arsenical Cigarettes, Chloroform Vapor, Coca or Eucalyptus leaves smoked, Compound Asthma Fluid (as spray), *Cubeb Cigarettes, Himrod's Cure by fumes, Ozonic Inhaler, Pilobrom, Potass. Nit. fumes, Pulvis Lobeliæ Co., Pyridine, Stramonium* or *Tobacco fumes, Vapor Coninæ*.

Balanitis.—*Lotions of Lead Acetate, Zinc Salts, Phenol Argent. preparations, Tannin, or Zinc Oxide Powder.*

Basedow's Disease.—See **Exophthalmic Goitre.**

Bed Sores.—*Acid. Tannic. Glycerin, Alcohol, Argent. Nit. in Nitrous Ether solution, Brandy, Glycerin*, Glycerin. Aloes, *Iodoform Gossyp. and Ung., Peruv. Bals., Tannin, Iodoform and Starch Powder, Resorcin.*

Beri-Beri.—*Phaseolus*, Strychnine

Bile, Deficiency of.—Ammon. Chloride, Bismuth and Opium, Chirata, *Colalin*, Hepatic Stimulants and Antiseptics, *e.g.*, Salol, Hydrarg. cum Cretâ, Pancreatised Milk, Sodii Glycocholas, Sodii Phosph. Efferves., Sodii Sulph. Efferves., Sodii Salicylas, Taraxacum.

Bilharzial Disease.—*Methylene Blue.*

Biliousness (Excess of Bile).—Calomel, Chirata, *Colalin*, Euonymin Iridin, Juglandin, Leptandrin, Podophyllin, Sanguinarin, Seidlitz Powders, Sodii Phosph. Efferves., Sodii Sulph. Efferves., Sodio-Magnes. Sulph. Eff., *Taraxacum Cocoa*.

Bites and Stings (Insects,—Mosquitos, &c.).—*Ammonia*, Blepharis Capensis, *Cocaine*, Hydrogen Peroxide, Lysoform, *Muscatol*, *Moskitin*, *Onion Juice*, *Phenol*, *Sodii Bicarb.*, *Spiritus Chloroformi*, *Thymol*, *Vinegar*.

Bites and Stings (Serpents').—Alcohol and Ammonia, *Blepharis Capensis*, Calmette's Anti-Venomous Serum, Potass. Permang., Strychninæ inject. hypod., Tinct. Ammon. Comp., *Mistura Oleo Balsamica*.

Arnicæ Tinct., Blepharis Capensis, *Chloroform*, *Chloral cum Camphora*, *Cocainæ Hydroch*, *Liquor*, Echinacea, Hydrogen Peroxide.

Blepharitis.—See **Conjunctivitis.**

Blistering Applications.—*Acetum*, *Collodium*, *Emplastrum and Liniment of Cantharides*, *Capsicum preparations*.

Boils and Carbuncles.—Alkalis, Arsenic, Calx Sulphurata, Ferri Perchlorid., Hypophosphites, *Iodates*, Levurine, Levuretin, Furunculin, Nuclein, Sulphides, Sulphurous Waters, Syr. or Pil. Sulphatum, Yeast, Zymin.

Argent. Nit., *Belladonnæ Glycerin*, (as pigment and on poultices), *Carbolated Camphor*, Cataplasm Salicyl. Co., *Collodium*, *Fermenti Cataplasma*, *Opii Ext.*, *Linimentum Atropinæ*, *Lysoform*, Potassium Permanganate Pencils, *Sphagnol*.

Brain, Softening of.—Bromides, Digitalis, Diuretics, Hypophosphites, Iron Salts, Morrhuæ Ol., Phosphorus.

Breast, Inflammation of.—All Antipyretics, *Belladonnæ Ext. Glycerin. and Linim.*, Phytolacca.

Breath, Fetid.—*Acid. Salicylic*, *Calcii Permang.*, *Camphora*, Cremor Magnesiæ, *Creosoti Vapor*, *Lysoform Mouth-Wash*, *Myrrh with Borax Tincture*, *Sanitas* (*Toilet*), *Thymaglycin*.

Bright's Disease.—Alkalis, Antipyrine, Auri Chlorid., Cannabis, Digitalis, Diuretin, Elaterium, Hydrastis, Iodo Caffeine, Iodo-Theobromine, Jaborandi and Pilocarpine, Nitroglycerin, Potass. Iodid., Scoparii Succus.

Bromidrosis.—Potassium Permanganate Wash. See also **Perspiration, Offensive.**

Bronchiectasis.—Creosote Inhaler. See also **Bronchitis.**

Bronchitis, Acute.—Aconite, Ammon. Acet. Liquor, Antimony, Apocodeinæ Hydrochlorid., Codeia Jelly, Glycaphorm, Ipecacuanha, Oxygen, Squill preparations.

Vapor Benzoin, *Camphor or Eucalyptus*, *Counter Irritation*. Ol. Succini.

Bronchitis, Chronic.—Allium preps., Ammon. Carb., Ammon. Chlorid., Apomorph. Hydrochl., Benzoates and Benzoin. Tinct., Cimicifuga, Codeina Cough Jelly, Creosote, Dionin, Eucalyptus Oil, Euphorbia, Grindelia, Heroin

Hypnal, Ipecacuanha, Morphine preps., Morrhuæ Ol., Piscidia, *Potass. Cyanidum*, Prunus Virginiana, Pulsatilla, Scilla, Senega, Syrup. Picis cum Codeina, Syrupus Picis Liquidæ, Thiocol, Tar, Terebenum purum, Terpin Hydrate, Terpinol, Tolu Balsam.

Vapores.—Acid. Carbolic., Acid. Sulphuros, Benzoini, Camphoræ, Creosoti, Cyllin, Terebeni, Iodi; Croton Ol. Linim., Iodi Linim. Ethyl Iodide, Guaiacol, Nebulæ, *q.v. Oxygen* inhaled.

Bruises.—*Arnicæ Tinct. (well diluted), Calendula, Hamamelis, Hydrastis Tinctura, Lot. Plumbi et Opii, Hazel Foam.*

Burns and Scalds.—*Acid. Boric Ung., Acid. Picric and Wool, Actol, Airol, Aristol, Calamin. Cerat., Chartazinc, Chloretone 10% Ointment, Cocainæ Ceratum, Dermatol, Epidermin, Europhen, Glyceritum Vitelli, Ichthyol, Iodoform, Itrol, Lanolin, Lini Ol. cum Aqua Calcis, Mollin, Sanoform, Thymol. Ung., Vaseline, Zinci Oleat. Ung., Zinci Ung, Hazel Foam, Volckmann's Solution.*

Bubo.—*Chlori Aqua, Hydrarg. Oleat., and cum Morphina, Hydrarg. Ung., Hydrogen. Peroxid.*

Calculi, Biliary.—Alkalis, Ox Bile, Oleic Acid, Sodii Benzoas, Sodii Bicarb., Sodii Glycocholas, Sodii Oleas, Soap.

Calculi, Urinary.—Alkaline Carbonates, Ammon. Benz. and Phosph., Aqua destillata, Calcis Aqua, Lithium preps., Mineral Acids (for Phosphatic), Pichi, Piperazina, Potass. Citras, Sodii Benz. and Hippuras, Triticum, Uricedin.

Detection of, *v.p.* 605.

Cancer.—Arsenic preps., Calx Sulphurata, Chelidonium, Chloral Hydras and Opium preps. (as sedatives), Condurango, Mist. Tereb. Chiæ., Terebinth. Chia, *Cancer bush*, Cancroin, *Ext. Violæ Liq., Liq. Violæ Glucosidi, Sodii Cinnamas, Tylmarin.*

Acid. Arsenious, Acid. Carbolic. (caustic), Acid. Carbolic. Glycerin., Acid. Chromic., Acid. Nitric Fumans, Acid. Sulph. Fumans, Acid. Salicylic. cum Oleo, Anæsthesin, Nectrianin, Auramine, Bromum cum Acid. Oleic., Coley's fluid, Finsen Light, Hydrarg. Nit. Acid. Liquor, Iodoform, Liquor Acido-Chromo-Aceto-Osmic, Local application of Arsenic (Trunecek), London Paste, Methyl Violet, Michel's Paste, Morphine, Morphinæ Oleat., Pyoktanin, Quininæ Hydrochloridi Injectio, Quininæ Salicylas, Radium, Resorcin, Vienna Paste, Viola Odorota, 'X' Rays, Zinci Chlorid. and Pasta, Doyen's Serum, Iodic Acid, Liq. Violæ Glucosidi, Sodium Orthocoumarate, *Sodii Phosphas Acid with Hydrochloric Acid, Symphytum Cataplasm*, Thoriae Comps., Trypsin, Ung. Thorii Oleat., Uranium Salts.

Cardiac Tonics — Adonidin, Adonis Vernalis, Barii Chloridum, Caffeina, Carpaine, Convallaria, *e.g.*, Glyco-gelatin Pastil, Coronillæ Extractum, *Digitalone*, Digalen, Digitalis, Erythrophlœum, *Hydriodic Acid*, Oxysparteinæ Hydrochloridum, Scilla, Sparteinæ Sulphas, Strophanthus, Strychnina, *Thyroid Extract*, Uropherin, Veratrum Viride,.

Caries. — Calcii Chlorid., Calcii Hypophosph., Calcii Phosph., Hæmol, Saccharated Wheat Phosphates, *Calcium Iodate.*

Caries, Dental.—Calcii Sulphidum (for Pyorrhœa).
Arsenical Paste, Dental Solubes, *Lanolin and Cocaine, Paramonochlorphenol, Salol or Lysoform Mouth Wash, Resina Carbolica.* See also Dentistry, local applications.

Cataract, to prevent Senile.—Iodides, Mercurials, Sarsaparilla; Tonics,—Quinine and Iron, Strychnine.

Catarrh, Gastro-intestinal. — Alkalis, Ammon. Chloride, Betol, Bismuth preps., as Bismuthi Benzoas, Oxy-Bromide, Salicylas, Sulpho-Carbolas, Sulpho-Cyanid., Phosphas, Bismutose, Caffeine, Calcinol, Collinsonia Canadensis, Eucalyptus Globulus, Hydrastis, Hydrocyanic Acid, Leptandra, Opium, Potassii Bichromas, Potassium Iodide, Salines, Salol, *Tylmarin.*

Catarrh, Nasal. — Aconite, Ammon. Chlor., Arsenic, Camphor, Cubebs, Quinine, Pilula Atropinæ Quininæ et Arsenici.
Acid. Carbolic. or Acid Tannic, Buginarium, Alum Spray, Anti-catarrhal salts, Bismuth. Co. Pulv., Camphor inhalation, Carbolised Smelling Salts, Comp. Asthma Fluid, *Dobell's Solution, Ethyl Iodide inhaled, Eucalypti Oleum, Hydrogen Peroxide, Iodoformi Buginarium, Menthol Inhalation, Injection, Wool and Snuff, Menthol and Camphor Inhalation, Ozonic Inhaler, Resorcin as Nebula, Sozoiodol, Supra-renal Extract, Ung. Belladonnæ,* Ung. Morphinæ *cum* Acid. Tannic.

Catarrh, Uterine.—*Acid. Carbolic. Glycerin., Boracis Glycerin., Camphorated Carbolic Acid, Iodoform. Gossyp. and Pessus,* Melaleuca, *Plumbi Subacet. Glycerin., Opii e Amyli Enema, Ung. Adrenalin,* Ovules (see List), *Zinci Sulph. Uterine Pencils, and with Alum, Zinol.*

Catarrh, Vesical.—See **Cystitis.**

Cathartics.—See **Constipation.**

Caustics.—*Copper Salts, Nitric Acid, Pasta Londinense, Potassa Fusa, Silver Salts, Sodium Ethylate, Vienna Paste, Zinci Chloride.*

Cerebro-Spinal Fever. — Antipyrin, Phenacetin, Opium. See article, p. 763.

Chancres, Soft.—*Acid. Dichlor-Acetic, Acid. Nitric. Fumans, Acid. Sulph. Fumans, Airol, Aristol, Bismuth Benzoate, Hydrarg. Flav. Lotio, Hydrarg. Nig. Lotio, Hydrarg. Subchlor.,* Iodic Acid, *Iodol, Iodoform. Pulv. and Ung., Michel's Paste, Plumbi Acet. Lotio, Resorcin.*

Chapped Skin.—*Acid. Boric. Ung., Camphor Ball. Ceratum Petrolei, Collodium, Glycerin. cum Aquâ Rosæ,* Hazel Foam, *Vaseline, Cucumeris Ung., Lanolin, Mollin, Ung. Phenoboric, Zinc Cream, Zinc Oleate.*

Chilblains. — Calcii Chloridum (internally), *Calcii Iodidum.*
Acid. Boric. Ung., Acid. Carbolic. Ung., Aconit. Linim., Belladonnæ Linim. and Linim. Co., Cajuput Ol., Capsici Linim., Collodium Iodi., Eucalypti Ol. Ung., Glycerini Plumbi Subacet. Ung., Hazel Foam, Hydrogen Peroxide Solution, Iodi Tinct. Decolor., Iodi Ung., Iodoform Wool and Ung., Oleanodyne, Plumbi Subacet. Glycerin, Picric Acid Solution, Tinct. Capsici fort.

Chloasma.—See **Freckles.**

Chlorosis.—Arsenic, Carniferrin, Ferratin, Ferri Amara Mist., Ferri Aper. Mist., Ferri Bromid., Ferri Carb. Pil. (Blaud), Ferri Carb. Sacch., Ferri Co. Mist., Ferri Dialysat. Liq., Ferri Perchlorid. Tinct., Ferri Sulph. Pil., Ferro-Somatose, Hæmogallol, Hæmol, Hypophosphites, Lacto-Somatose, Levico Water, mild and strong, Manganese Citrate, Manganesii Oxidum, Marrubin, Mistura Ferri Arsenicalis, Myrrh et Aloes Pil., Nickel Salts, Peroxides, Phosphorus, Santonin, Sodii Persulphas, Somatose, Tinct. Martis., Tinctura Ferri Pomata, Vanadates.

Cholera.—Antitoxin of Haffkine, Atropine injection, Camphora, Chloromorphiæ Liq., Copper Salts, Coto and Cotoin, Cresol Salicylas, *Hope's Camphor Mixture*, Hydrarg. cum Cretâ, Hydrarg. Subchlorid. cum Opio, Hypod. injections of Quinine Hydrochlorosulphate and Carbamide, Morphina, Opium, Paracotoin, Plumbi cum Opio Pil., Resorcin, Salol, Sedeff, Tinctura Capsici or Cayenne in Brandy in emergency, Tinctura Chloroformi Co., Tribromophenol-Bismuth, *Tylmarin.*

Tannin rectal injection, Saline Solution rectal injection.

Cholelithiasis.—See **Gall Stones.**

Chordee.—Aconite, Belladonna, Bromides, Camphora Cannabis, Canthar. Tinct. (one minim hourly), Chloral Hydras, Hyoscine, Hyoscyamine, Morphinæ inj. hypod., Opii Suppos.

Chorea. — Actæa, Antipyrine, Arsenic, all Bromides, Cacodylates, Cannabis and Chloral, Calcii Chlorid., Camphor Monobrom., *Cephalopin*, *Formates*, Chloral Hydras, Cimicifugin, Codeine, Conium and Coninæ Hydrobrom., Ferri Bromid. Ferri Phosph., Gelsemium preps., Morrhuæ Ol., Phosphorus, Physostigma and Physostigmine, Salicylic Acid, Sodium Salicylate, Strychnine, Valerianates, Zinci Bromid. and Oxide, Iodides.

Cold, Common.—See **Catarrh, Nasal.**

Colic, Intestinal.—Æther, Anethi Aqua, Belladonna, Calcis Aqua (for infants), Cajuput. Ol., Camphora, Chloroform, Chloromorphiæ Liq., Menth. Pip. Ol., Morphine preps., Opium preps., Tinctura Carminativa, Bromides, Chloral, Hyoscyamus, Peppermint, Ruta.

Colic, Hepatic and Renal.—Opium, Morphine, Belladonna (in large doses). Amyl Nitrite, Chloroform, or Ether inhalation.

Colitis.—Bismuth Salicylate, Hydrastis, Methylene Blue, Naphthalene, Salicylates, Salol.

Saline and Boric Enemata, Copper Sulphate injection, *Oils.*

Collapse and Fainting.—Æther inj. hypod., Æther. Spt., and Spt. Co., Alcohol, Ammon. Arom. Spt., Ammon. Vapor, Amyl Nitris., Digitalis Tinct. and Inj. Hypod. 20 m., Nitro-glycerin Tablets.

Comedones — Glycerinum Kaolin Aceticum, Iodates, *Phenol*, *Calx Sulphurata*, *Fowler's Solution*, *Ichthyol*, *Resorcin.*

Conjunctivitis.—*Acid. Boric.*, *Alsol*, *Alumen*, *Argenti Acetas*, *Argenti Fluoridum*, *Argenti Nitras*, *Argyrol*, *Belladonna*, *Boroglyceride*, *Borax*, *Collyrium Adstringens Luteum*

Cuprocitrol, *Hydrarg. cum Morphinâ Oleat, Hydrarg. Oxid. Flav. Ung.*, Hydrastinin Lotion, *Hydrogen Peroxide, Hydroquinone, Iodol, Nargol, Opii Vinum, Protargol, Resorcin, Thioform, Zinc. Acetat. vel., Sulph. Lotio.*

Conjunctivitis, Diphtheritic.—*Formaldehyde, Hydroquinone, Iodol, Quininæ Sulph. Lotio., Resorcin*, Methylene Blue.

Constipation.—Aloes and Aloin, Belladonna, Caffeine, Chloral, Cascara Sagrada and Capsules, Elixir, Pastils and Syrup of, Coloc. Co. Pil., Coloc. Co. cum Hyoscy. Pil., Compound Capsules of Castor Oil, Convolvulin, Elixir Ficorum, Emblic Myrabolans, Glycyrrh. Co. Pulv., Guaiacum and Sulphur Tablets, Hydrarg. Subchlorid., Iridin, Jalapin, Juglandin, Laxol, Leptandra, Magnes. Sulph., Manna, Mineral Waters, Mist. Laxativa, Mist. Rosæ Lax., Nux Vomic., Ol. Ricini et Glycerin, partes æquales, Phenolphthalein, Pil. Cascara Comp. Podophyllin, Purgen, Purgatin, Rhamnus Frangula, Rhei Co. Pil., Rhei Co. Pulv., Ricini Ol., Ricini Ol. Mist., Scammon. Co. Pil., Seidlitz Powders, Senna, Sennæ Confect., Sennæ Co. Mist., Sennæ Elixir, Sodii Phosph. Efferves., Sodii Sulphas Efferves., Sodio-Magnes. Sulph. Efferves., Sodii Sulpho Ricinas, Sodii Sulpho-vinas, Stillingia, Sulphur, Sulphur. Confecto., Tinct. Aloes Co., Tinct. Laxativa, *Cascara Jelly, Mistura Cascaræ Comp., Mistura Hepatica, Ol. Ricini Aromaticum, Magnesium Chloride and* Citrate, *Flax Seed, Paraffinum Molle c. Agar, Taraxacum Cocoa.*

Glycerini Inject. and Suppositories.

Convulsions. — *Æthusa*, Amyl Nitris, Anæsthetics, Bromalin, Camphor. Monobrom., Chloral, Chloroform, Conium, Morphine preps., Moschus, Podophyllin, Potassii Bromid., Rubidium Bromide, Santonin, Sodii Bromid., Sodii Nitris.

Chloral Suppositories.

Convulsions, Puerperal.—Amyl Nitrite Capsules, Anæsthetics, Chloral Hydras, Chloroform, Musk, Nitroglycerin, Pilocarpine, Veratrum Viride.

Cirrhosis of Liver.—Ammon. Chloride, Iodides, Acid Nitro-hydrochloric, Sodium Phosphate.

Cornea, Inflammation, and Ulcers of.—*Atropine, Belladonna, Boric Acid Lotion, Cocain. Hydroch. Liquor, Daturine, Duboisine, Eserine, Fluorescein and Uranin (diagnostic), Holocaine Hydrochloride, Hydroquinone, Hydrarg. Oxid. Flav. Ung., Hydrarg. Subchlorid., Infusum Abri, Pilocarpine, Quinine Lotion.*

Corns.—*Acetic Acid (glacial), Carbolic Acid, Collodium Callosum, Cupri Oleas, Fowler's Solution of Arsenic, Papaw, Formalin, Lin. Iodi., Ung. Iodi Intinctum, Iodum Oleatum.*

Corns, Soft.—Durine, *Silver Nitrate Solution 1 in 3 applied every 4 or 5 days.*

Coryza.—See **Catarrh, Nasal,** and **Hay Fever.**

Cough.—Acid. Hydrobromic., Acid. Hydrocyanic., Belladonna, Camph. Co. Tinct., Chloral Hydras, Codeina, Conium, *Cynoglossum*, Dionin, Elixir Pectorale, *Gee's Linctus*,

Gelsemium, Glycaphorm, Glycoheroin, Helenin, Heroin, Hyoscyamus, Hypnal, *Lichenoids*, Linctus Camphor. Comp., Marrubium, Morphinæ Linctus, Morphinæ Troch., Morphinæ et Ipecac. Troch., Opium preps., Pastilli varii, *q.v.*, Picis Liq. Pil., Prunus Virginiana, Rami Syrup, Sandal Wood Oil, Spirit of Chloroform, Syrup. Pini Pumilionis, Terpin Hydrate, Terebenum, Terpinol, Troch. Tussis. *Tinct. Benzoin Co., Camphor and Creosote inhaled.*

Cystitis. — *Acid Camphoricum*, Acid Lactic, Aconite, Alkalis, Ammonium Benzoate, Antinosin, Alphol, Arenaria rubra, Arbutin, Betol, Belladonna, Benzoates, Boric Acid, Buchu, Cannabis Indica, Collinsonia Canadensis, Copaiba, Eucalyptus Globulus, Glycosal, Gokhru, Helmitol, Hetraline, Hexamethylentetramine, Hydrastis, Juniper, Kava Kava, Liquor Potassæ, *Magnesii Boro-Citras*, Pareira, Pichi, Saccharinum, Salacetol, Salol, *Santyl*, *Sorghum*, Triticum repens, Uva Ursi.

Argenti Fluoridum and Nitras, Argyrol, Cocaine Lactate, Creolin Solution, Lysoform, Sozal, Formicin.

Cystitis, chronic.—Ammonium Benzoate, Buchu, Grindelia, Juniper, Pareira, Salol, Sandal Wood, Uva Ursi.

Croup, False.—See **Laryngismus Stridulus.**

Debility.—Alcohol, Arsenic preps., Bone Marrow Extract, Bovril, Calcii Hypophosph. Syrup, Calcii Phosph., Capsulæ Cruoris, Cinchona preps., Eupatorium, Ferratin, *Fluoroform*, *Formates* (*Inorganic and of Quinine*), Gentiana, Glycerophosphates, *Glycerole of Hypophosphites*, Hæmoglobin Capsules and other preps., *Histogenol*, Hypophosphites, Iron Salts, Levico Water, mild and strong, Maltum, *Malted Glycerophosphates*, Maltolivin, Marrubin, Malt Ext. cum Syr. Ferri Phosp., Milk, dried (varieties), Morrhuæ Ol., Phosphorus, *Pil. Potentin Co.* Quassia, Quinine preps., *Sicco*, Sodium Cacodylate, Somatose, Strychnine, Syrup Ferri Phosphat. cum Quinina et Strychnina, *Syrupus Glycerophosphatum cum Formatibus*, *Tylmarin*, *Virogen*. See also **Anæmia.**

Delirium Tremens, and see **Alcoholism.**—Ammon. Carb., Apomorphine, Auri Chlorid., Bromides, Camphora Monobromata, Capsicum, Chloral, Digitalis, Hyoscine, Hyoscyamine, Opium preps., Phosphorus, Quinine preps., Strychnine, Sulphonal, Valerianates, Sodium Chloride Injections

Dengue Fever.—Sodium Salicylate, Salicin, Potassium Iodide, Phenacetin and Caffeine. No drug is specific.

Dentistry, Local Applications. — Adreucaine, Alcohol Sandarachi, *Baldock's Paste*, *Cinnamon Paste*, *Cocaine Lanolin*, Codrenine, Collutorium Alkalinum, Collutorium Astringens, Collutorium Formalin, and with Creolin, *Copal Solution*, Dental Anæsthetic, *Dental Compo*, *Dentalone*, *Dental Rubber*, *Dental Wax*, Emplastrum Capsici, *Eucaine Lactate*, Erythrophleine, *Fletcher's Artificial Dentine*, Gossypium Arseniosum, *Hydrogen Peroxide*, Iodoform Paste, Lysoform Mouth Wash, Tooth Paste, and Dental Dressing, *Mercury Amalgam*, *Pasta Arsenicalis*, *Pyrozone*, Zinc Oxychloride, Zinc Oxyphosphate, Zinc Oxysulphate.

For suspended animation after anæsthetics.—Amyl Nitrite Capsules.

Diabetes Insipidus.—Arsenic, Adrenalin, Belladonna, Ergot, Gallic Acid, Lithium Salts, Lithion, Opium, *Rhus Aromatica.*

Diabetes Mellitus.—Acid. Gallic, *Almo Food*, Acid. Lactic., Alkalis, Arsenic Brom., Aspirin, Cacodylates, Codeina, Codeinæ Pil. Co., Convallaria, *Cremor Magnesiæ*, Creosotum, *Djocat*, Dulcin, *Duodenal Extract*, Eucalypti fol. inf., Glaucium Luteum, Gold Salts, *Glycerin*, Hexamethylene tetramine, Hydrogen Peroxide, Iron Salts, Jaborandi, Jambul, Lævulose, Levurine, Magnes. and Sodium Peroxides, Morphina, Nuclein, Opium, Oxygen, Ozonic Ether, Pancreatine, Phosphorus, Potassium Chlorate, Saccharin, Elixir and Tabellæ of, Salol, *Sedeff*, Sodii Arsenias, Sodium Chloride intravenously, Sodii Citras, Sodii Phosphas, Sodii Salicylas, Supra-renal gland, Thymol, Thyroid gland, Uranii Nitras, *Virogen*, Yeast.

Diarrhœa.—Acid. Camphoric, Acid. Carbolic., Acid. Gallic., Acid. Hydrochloric Dil., Acid. Lactic., Acid. Sulph. Dil. and Aromat., Agaricus albus and Agaricin, *Albumen Water*, Anthemidis Tinct., Anthemis, Benzo-naphthol, Bismal, Bismuthi et Cerii Salicylas, Bismuthi Salicylas, Tannas and other preps., Cajuput Oil, Calcii Carb., Calcii Salicylas, Calcis Aqua, Camphora, Catechu, Cinnamon, Cloves, Coto, Cotoin, Creolin, Cretæ Arom. Pulv., and cum Opio, Cupri Sulph., Cupri Sulphocarbol., Eucalyptus Gum., Ferri Salicylas, Fortoin, Guaiasanol, Hæmatoxylin, Honthin, Hydrarg. Perchlor. in small doses, Mist. Antiseptica, U.C.H., for infants, Naphthalin, Naphthol, Opium preps., Plumbi Acet., Pulv. Ipecac. Co., Pulv. Kino Co., Quercus, Quininæ Salicylas, Resorcin, Ricini Ol. *and Aromaticum, Sedeff*, Salacetol, Sassafras, Sodii Phosphas, Tannacol, Tannigen, Tribromophenol-Bismuth, Zinc Sulpho-carbolate.

Acid. Tannic. Suppos., and cum Opio, Amyli Enema, and cum Opio. Gallæ Suppos. and cum Opio, Tannin rectal injection, Turpentine Stupes.

Diphtheria.—Acid. Salicylic., Aconite, Antitoxin, Ferr Perchlorid., *Hydrogen Peroxide*, Sodii Benzoas, Sodii Chloras, Sodii Hyposulphis., Strychnine preps. for paralysis when a sequela, Tribromophenol.

Acid. Benzoic. Nebula, Acid. Carbolic. Glycerin. and Nebula, Acid. Lactic. Nebula, Acid. Sulphuros. Nebula, Calcis. Aquæ Nebula, Chlori Gargarisma, Eucalypti Ol. and Vapor, Formol Spray, Iodic Acid, Hydrogen Peroxide, Hydroquinone, Iodol pigment, Loeffler's pigment, Menthol pigment, Naphthol cum Camphora, Ozonic Ether, Papayotin, Resorcin, Sodii Benzoatis Nebula, Sodii Chlorinat. Liquor, Toluol, Nebula Acid Malic.

Dipsomania.—See **Alcoholism.**

Dropsy, Cardiac.—Adonidin, Agurin, *Apocynum preps.*, Asparagin, Barium Salts, Caffeine, *Chimaphila*, Convallaria majalis, Delphina, Digitalin, Digitalis, Elaterium, Erythrophlœum, Iodo-Caffeine, Pyoktanin, Strophanthus, *Theophylline*, Veratrum Viride.

Dropsy, Hepatic.—Ammon. Benzoas, Ammon. Chlorid., Copaibæ Bals., Cytisin, Hydrarg. Pil., Hydrarg. Sub chlorid., Sodii Bicarb., Sparteinæ Sulphas, Taraxacum, *Chimaphila.*

Dropsy, Renal.—Apocynum Cannabinum, Blatta orientalis, Buchu, Caffeina, Copaiba, Digitalis, Diuretin, Delphina, Elaterium, Gin, Hemidesmus, Hydrarg. Pil., Iodo-Caffeine, Iodo-Theobromine, Jalapa, *Moringa*, Pilocarpine, Potass. Acet., Potass. Tart. Acida, Potassii Iodid., Potass. Nit., Scilla, Scoparius, Sodii Iodid., Theocin, Theophylline.

Dysentery.—Alum, *Antidysenteric Sera*, Argenti Nitras (Rectal Injection), Belæ Fructus, Bismuthi et Cerii Salicylas, Calotropis, Cannabis, Cassia Beareana, Calomel, &c. (the evacuant method), *Crocq's Pill*, Cupri Sulphocarb., *Cynoglossum*, Eucalypti Gum., Guarana, Hæmatoxylon, Hamamelis, Hydrarg. Perchlorid., Ipecacuanha, Ipecacuanha sine Emetina, Ipecac. Co. Pulv., *Kosam Seeds*, *Levure*, *Levurine*, Magnesium and Sodium Sulphates, Naphthalene, Opium, Plumbi Acetas, Salicylic Acid by Rectal Injection, *Sedeff*, Simaruba, Terebenum purum, Terebinth. Ol., and Stupes of, Yeast.

Dysmenorrhœa.—Actæa, Æther Spt. cum Opii. Tinct., Amyl Nitris, Anemonin, Antipyrine, Apiol, Belladonna Suppository, Butyl Chloral, Cannabis and Cannabin Tannas, Cannabis and Chloral, Carbon. Tetrachlor. Vapor, Cimicifugin, *Castor*, Camphor, Gelsemium preps., Gossypii Rad. Cort., *Mist. Dysmenorrhœica*, *Oleum Valerianæ*, *Opium*, *Ovules Morphine*, *and others*, Piscidia, Potass. Bromid., Pulsatilla, Salix nigra, Saw Palmetto, Serpentaria, Sodii Salicylas, Syr. Iodo-Tannicus, Valerian, Viburnum prunifolium, and *see page* 481.

Dyspepsia.—Acid Carbolic, Perle and Pil., Acid Nit. Dil., Acid Hydroch. Dil., Aloes and Aloin, Ammon. Carb., Ammon. Chloridum, Arsenic, *Atropine Methyl-Bromide* Bismuth, Benzoas, Carb., Oxy-Bromid., Oxychlorid., Subnit. Phosphas, Sulphocarbol., and Sulphis Calcii Peroxid., Capsicum, Cerii Oxalas, Condurango, Creosote, Creosoti Valerianas, Emblic Myrabolans, *Eupatorium*, Gentiana, Gingerin, Gold Salts, Hydrarg. cum Creta, Hydrastis, Hydrocyanic Acid, Leptandra, *Oleum Valerianæ*, *Magnesia Cream*, *Magnesii Hydroxidum cum Carbone*, *Monsonia*, Nux Vomica, Pancreatin, Papain Glycerin, Acid., Peptonising Powders, Pepsin, Pepsin Jelly, Pepsin and Bismuth Tablets, Podophyllin, Potass. Bichromas, Quassin, Quinine preps., Rhei Rad., Rumicin, Sal Polychrestum, Sanguinarin, Sedeff, *Serpentary*, Sodii Bicarb., Sodii Hyposulphis, Sodii Sulphocarb., Sodii Taurocholas, *Sodium Citrate for adding to Milk*, *Strontii Bromidum*, Strontii Lactas, Tinct. Rhei Aquos, Troch. Antacidi. *See also* Address on.—L. i./06,1590.

Dyspnœa.—Æther Spt., Æthyl Iodid., Alcohol, Ammon Carb., Amyl Nitris, Erythrol Nitrate tablets, Lobelia, Morphine, Nitroglycerin, Ozonic Ether, Potassii Cobalto-nitris, Quebracho and Aspidospermine, Sodii Nitris, Strychnine.

Earache.—*Atropinæ Liquor or Oleatum (diluted)*, *Chloroformi Vapor*, *Cocaina cum Oleo*, *Delphina in Spirit or in Ung.*, Menthol-Paraffin Capsules, *Morphinæ Oleatum (diluted)*, *Opii Tinct. cum Oleo Olivæ*. *See also* Nebulæ.

Eczema.—Arsenic preps., Bromocoll, *Cupri Sulphas*, Iron Salts, Morrhuæ Ol., Phosphorus, Sulphides, Sulphur.

Acid. Boric. Lotio and Ung., *Acid Carbolic Lotio and Ung.*,

Acid Salicylic Ung., Alkaline lotions, Aristol, Æthol, Bismuth Nit. Glycerin, Collargol, Calaminæ Lotio, Calcis Aqua, Calcit Linim., Chrysarobini Ung. (weak), Creolin, Dermatol, Diachyli Ung., Dymol, Europhen, Formalin, Moist (for dry condition), *Gallanol,* Griserin, *Huile de Cade, Icthalbin, Ichthyol and Collodion and paste of,* Iodates, *Isarol, Kaolin Ung., Lanolin, Lotio Nigra, Lysoform dusting powder, Methylene Blue, Mollin, Myelocene, Naftalan, Naphthol, Petrosulfol,* Pellanthum preps, *Pasol, Resorcin, Sphagnol, Tar, Thigenol, Thio-resorcin, Thiol, Thymol, Tumenol, Ung. Hydrarg. Ammon., Ung Hyd. Ox. Flav.,* Unguentum pro Eczema, Ung. Thorii Oleatis (Thoriac Brand), *Ung. Rumicis, Ung. Rusci Co.,* 'X' rays and Finsen Light, *Zinci Boras, Zinci Cremor, Zinci Oleat. Pulv. and Ung., Zinci Ung. See also* L.i./05,1725.

Emetics.—Apomorphine $\frac{1}{10}$ grain inject. hypod., Antim. Tart. 1 to 2 grains, and Vinum 2 to 4 drachms, Emetine $\frac{1}{100} - \frac{1}{25}$ grain, *Hydrarg. Sulphas,* Ipecac. 30 grains, and Vinum 4 to 6 drachms, Mustard a tablespoonful, Sodii Chloridum a tablespoonful, Zinci Sulphas 20 to 30 grains.

Endocarditis.—Aconite, Belladonna, Caffeina, Collargol, Coronillæ Ext., Digitalis, *Ferric Chloride,* Levurine, Nuclein and Anti-Streptococcic Serum, Veratrum.

Belladonna Plaster, Blisters, Ice Bag.

Enteritis.—See **Gastro-enteritis.**

Enuresis.—Atropine, Belladonna, Ergot, Hyoscine, Hyoscyamus with Sodium Bromide, *Hexamethylenetetramine,* Lycopodium, Potassii Citras, Rhus Tox.

See also **Incontinence of Urine.**

Epididymitis. — Aconite, Antimonial Wine, Iodides, Saline Purgatives.

Ice, Iodine, Guaiacol, Iohydrin, Iodum Oleat, *Lin. Potassii Iodid., Ung. Iodi Intinctum. Heat with moisture, Mercury, and Belladonna Ointments.*

Epilepsy.—Adonis, Æthyleni Bromid., Ammon. Bromid., Amyleni Hydras, Amyl Nitris, Antifebrin, Argent. Nit., Arsenic, Arsen. Bromidum, Atropine, Auri Bromid. and Chlorid., Belladonna, Borax, Bromalin, Bromal-Hydras, Brominol, Bromipin, Bromocoll, Calcium Bromide, Camphora Monobromata, Cannabis, *Cephalopin,* Chloral, Hydrargyri Biniodidum, Isopral, Liquor Auri et Arsenii Bromid. and Liquor Auri et Hydrarg. Bromid., Magnesium Bromide, Manganese Bromide, Mistura Bromiuol cum Nuce Vomica, *Nickel Bromide,* Nitroglycerin Tablets or Liquor, Neuronal, Ozonic Ether, Picrotoxin, *Pilobrom,* Potass. Bromid., Pot. Nitris, Rubidium Ammonium Bromide, Rubidium Bromide, Santonin, Sodii Bromid., Sodii Nitris, Strontii Bromid., *Solanum Carolinense,* Valerianates, Verbena, *Viscum album,* Zinci Bromid., Zinci Citras, Lactas and Sulphas.

Epistaxis.—Acid. Gallic., Aconite, Acetanilide, Calcium Chloride and Elixir, Digitalis, Ergot inject. hypod., Erigeron Oil, Ferro-Alumen, Ferri Perchlorid. Hamamelis, Terebinth. Oleum.

Acid. Tannic., Adrenalin, *Alumen,* Cotarnin, *Ferri et Quininæ Chloridum, Ice, Hamamelis, Liquor Ferri Perchlor., Matico, Styptic Colloid.*

Erysipelas.—Aconite, Aconitina and Granules of, Antifebrin, Antistreptococcic Serum, Belladonna, Digitalis, Ergot, Ferri Perchlorid., Nuclein, Veratrum viride.

Acid. Picric. Pigment, Acid. Sulphuros. Lotio, Amylum, Amyli Glycerin., Argent. Nit., Belladonnæ Glycerin., Calaminæ Lotio, Cocainæ Ceratum, Collodium, Creosotum et Amylum, Ergotine in Sol., Gossyp, Acid. Boric., Iodi Pigment, Iodates, *Iodum Oleatum, Ung. Iodi Intinctum, Iohydrin, Cotarnin Ointment.*

Erythema.—Febrifuge Salines, Aconite, Anthemis, Salicylates, Salicin, Salol.

Amyli Glycerin., Anthemid. Infus., Diachyli Ung., Kaolin and Lotio. or Ung., Papav. Infus., Plumbi Subacet. Lotio., Vaseline, Zinci Oxid. and Ung., Ung. Thorii Oleat, High Frequency Current, Pellanthum preps., Hazel Foam preps.

Exophthalmic Goitre.—Belladonna, Digitalis, Duboisine, Iodine preps., Iron Salts, Potass Iodid., Quinine preps., Rodagen, Sparteine, Suprarenal Extract, *Thyroidectin.*

Tinct. Iodi. Oleosa, Ung. Iodi, Ung. Iodi Intinctum, and Iohydrin.

Eye: Pupil, Contractors of.—*Arecoline in 1% solution, Jaborandi and Pilocarpine, Opium and Morphine, Physostigma, Physostigmine.*

Eye: Pupil, Dilators of.—*Atropine, Salicylate, and Sulphate, Atropine-Methyl Bromide, Belladonna, Cocaine, Daturine, Duboisine, Ephedrine, Eumydrin, Euphthalmine, Homatropine and Hyoscine salts, Hyoscyamine, Mydrine, Nicotine, Oleum Atropinæ, Oleum Atroscinæ, Oleum Homatropinæ, Scopolaminæ Hydrobromid.*

Eye: Local Dilator, but Contracts when given internally in suitable doses—Gelseminine.

Fainting.—See **Collapse.**

Favus.—See **Parasites, Vegetable, of Skin.**

Fetid Breath.—See **Breath, Fetid.**

Fetid Perspiration.—See **Perspiration, Fetid.**

Fetid Nasal Discharges.—See **Ozæna.**

Fever. — Acetanilide, Acid. Oxy-naphthoic, Acid. Salicylic., Aconite, Ammon. Acet. Liq. and Carb., Antifebrin, Antimony, Antipyrine, Aspirin, Bromopyrin, Chinoline, Cinchonine, Cinchonidinæ Sulph., Digitalis, Euphorin, *Eupyrin,* Gelsemium, Granules d'Aconitine, Monabromacetanilide, Phenacetin, Phenalgin, Phenocoll Hydrochlor., *Populin, Potassii Boro-tartras,* Potass. Acet., Chloras and Citras, Pyramidon, Pyranum, Quinine preps., Quinidinæ Sulph., Quinetum, Salicin, Salipyrin, Sodii Salicylas, Thallin, Thermodin, Urea, Veratrum Viride, Warburg's Tincture.

Fissures of Nipples.—*Acid Boric, Acid. Tannic, Glycerin., Alcohol, Argent. Nit. pigment, Cocainæ Hydroch. Liquor, Collodium Flexile, Hydrastis Tinct., Plumbi Subacet. Glycerin., Styptic Colloid, Tinct. Benzoin Co.*

Flatulence.—Acid. Carbolic., Acid. Sulphuros., Æther Spt., Asafetida, Betol, Bismuth preps., Capsicum, Carbo Ligni. Chloromorphiæ Liquor, Creosote, Magnesia preps., Menth. Pip. Ol., Naphthalene, Naphthol, Nux Vomica, Pepsin preps.,

Sodii Bicarb., Sulpho-carbolates, Tinct. Carminativa, Zingiberis Tinct., Anise, *Anethol*, Cinnamon, Cloves, Asafœtida, Caraway, Cardamoms, Coriander, Fennel, Myristica.

Food Products.—See **Chapter on Food Products**, *Almo Food, Casein Preparations.* For Invalids are: Enema Nutriens, Peptonoids of Beef, Pepsin Jelly, Pastilli Pepsinæ, Nutrient Suppositories, Peptonised Milk, Peptonised Beef Jelly, Pancreatised Farinaceous Food, Pancreatised Emulsion of Fat, Wheat Phosphates, Salep.

Freckles.—*Hazel Foam, Boric Acid Lotion, Corrosive Sublimate Lotion*, Lactic Acid Lotion, Cucumber Ointment, *Lysoform, Mistura Amygdalæ, Ung. Plumbi Carbonatis.*

Gall Stones and Hepatic Colic.—Æther Spt., Amyl Nitris, Anæsthetics, Bismutose, Chloral Hydras, Chologen, Hexamethylentetramine, Iridin, Magnesium Sulphate, Mercurials, Morphine preps., Nitroglycerin, Perles of Ether and Turpentine, Pil. Sodii Oleat, Podophyllin, Salicylates, Sodium Benzoate, Sodium Glycocholate. Various Mineral Waters, *e.g.*, Carlsbad, *q.v.*

Gangrene. — Nitroglycerin, Amyl Nitris, Sodium Nitrite, *Acid Carbolic, Creosote, Bromine, Acid Nitric.*

Glanders.—*Mallein*, by hypodermic injection.

Gastralgia.—Acid.Hydrocyanic. Dil., Æther. Spt., Alkalis, Anæsthesine, Belladonna, Bismuth, Bismuthi Salicylas, Bismuthi Oxy-Bromid., Calcis Aqua, Cerii Oxalas, Chloroform, Ginger Chloromorphiæ Liq., Coca and Cocaina, Codeina, Creosote, Magnesia, Cremor Magnesiæ, Manganesii Oxid., Pepsin, Pepsin Jelly, *Sedeff.*, *Bisedia, Senecio*, Bromides, Cannabis, *Iodates, Chloretone*, Cyanides, Menthol, Nitroglycerin. *Linim. Sinapis, Ung. Ipecac. et Crotonis.*

Gastric Catarrh.—See **Catarrh, Gastric.**

Gastro-Enteritis.—Ammon. Chlor., Bismuth preps., Bismuthi Benzoas, Calcii Salicylas, Carminatives and Sedatives, Collargol, Hydrastis, Sanguinaria, Strontium Salts, Tar Perles. *Vide* also **Catarrh, Gastric.**

Gastric Ulcer.—Argenti Nitras, Morphine, Olive Oil.

Glands, Enlarged.—Calcii Chlorid., Ferri Iodid. and Iron Salts, Iodum, Morrhuæ Ol., Potass. Iodid., Sodii Iodid, *Syrupus Iodo Tannicus.*

Cadmii Iodid. Ung., Hydrarg. Oleat. and Emplast., Iodi Decolor. Tinct., Iodoform, Iod. Linim. and Ung., Iohydrin, Pot. Iodid. Ung.

Glaucoma.—*Physostigminæ Sulph. and Oleum, Pilocarpina*, Alkaloidal Oil of Physostigmine, Arecoline.

Goitre.—Acid. Hydrofluoric. Dil., Arsenic, Belladonna, Bromides, Convallaria, Hydrarg. Biniodid., Hydrastis, Iodum, Phosphorus, Potass. Iodid., Sodii Iodid., Thymus Gland, Thyroid feeding and preps., *Barii Chloridum, Quinine Periodide.*

Acid. Acetic. inj. hypod., Acid. Osmic. inj., Hydrarg. Biniodid. Ung., Hydrarg. Oleat., Hydrarg. Ung., Iodi inj. hypod. T. H. Iodi Linim. and Ung., Cocaine Ionisation 'X' rays

Gonorrhœa.—Acid. Cubebic., Aconite, Buchu, Copaiba, Cubebs, *Erigeron Oil*, Gonal, Gonosan, Helmitol, Hetraline, Hydrastis, Kava-Kava, Pichi, Potassium Salts, Saline Aperients, Salix nigra, Santal preps., Saw Palmetto, Uritone, Hydrastis, Uva Ursi.

Acid. Carbolic., Acid. Tannic., Alumnol, Argentamine, Anæsthesini, Argenti Acetas, Fluoridum, Nitras, Argentol, Argonin, Argyrol, Bismuth Oxyiodid., Bougies Urethral, Collapsubes various (see Index), Collargol, Europhen, Hydrarg. Perchlor., Iodoformi. Cereolus, Iodof. et Eucalypti Cereolus, Iodoformal, Largin, Potass. Permang., Protargol, Resorcin, Uritone, Wood Wool Bags, Zinci Acetas. Chlorid., Permang., and Sulphocarbolas. For female, Pessaries of Ichthyol or Iodine, Argenti Iodidum, Hydrastis, Ovules various, see text, Anti-serum, *Griserin, Santyl.*

Gout.—Acid. Quinnic., Acid. Thyminic, Aconite, Asaprol, Aspirin, Bromal Hydas., Caffein Tri-iodide, Chinotropin, Citarin, Colchicine Salicylas (*capsules*), Colchicum and Colchicin, Glycerophosphates, Guaiacum, Hexamethylenamine Tetramine, Kava-kava, *Lappa*, Lithii Carb., Citras, Hippuras, Tartras, Tartras Acida, Lithion, Lycetol, Lysidine, Magnes. et Sodii Sulph., Morphine Injection Hypodermic, Piperazin Glycerophosphate, Piperazin and Phenocoll Granular Eff., Piperidin Guaiacolas, Tartras, Potass. Acet., Cit., Iod., Pot. Chloride as Table Salt, Sidonal, Sidonal (new), Sodii Bicarb., Benz. Hippuras, Iodid., Phosph., Salicyl, Taurocholas, Tylmarin, Urea Quinate, Uricedin, Uropherin, Urosin, Ursal, Veratrum.

Borax Solution locally, *Cocaine Ionisation*, Chloroform Liniment.

Graves' Disease.—See **Goitre Exophthalmic.**

Gums, Inflamed, and Spongy.—*Acid. Carbolic., Alumen, Anise mouth wash, Cteachu, Cocaine, Cremor Magnesiæ, Iodi Tinct. and cum Aconiti Tinct. Krameriæ Tinct., Listerine, Lysoform Mouth Wash, Myrrhæ et Boracis Tinct., Potass. Chlorat., Pastil, Tablet and Troch., Pyrethri Tinct., Sodii Chloras and Troch., Thymaglycin.*

Hæmatemesis.—Acid. Gallic., Acid. Sulph. Dil., Acid Tannic, Adrenalin, Alumen, Argenti Nitras, Ergota, Hamamelis, Iron Persalts, Plumbi Acet., Supra-renal Extract, Terebinth. Ol.

Hæmaturia.—Acid. Gallic., Antimony, Camphor, Cannabis, Erigeron Canadense, Ergota, Ferro-Alumen, Hamamelis, Rhus aromatica, Terebinth. Ol.

Vesical Injections of Adrenalin, Alum, Gallic Acid, Hamamelis.

Hæmoptysis.—Acid. Gallic., Acid. Pyrogallic., Acid, Sclerotic., Acid. Sulph. Dil., Alumen, ***Amyl Nitrite Capsules***, *see page* 124, Antipyrine, Atropine, Bromides, Chloral, Digitalis, Erigeron Canadense, Ergota and Ergotin, Hamamelis, Morphine, Opium, Symphytum, *Rectal Injection of Calcium Chloride.*

Atomised Spray of Alum or Monsel's Salt Solution.

Hæmorrhage.—Acid. Gallic., Acid. Sclerotic., Acid. Sulph. Dil., Adrenalin and Supra-renal preparations, Calcium Chloride, Cornutine, Cupri Sulph., Digitalis, Ergota, Ergotin, Eucalyptus Gum, Ferri et Quininæ Chlorid., Ferro-Alumen, Gelatin, Hæmatoxylum, Hamamelis, Ice, Iron Persalts, Plumbi Acet., Potassii Succinas, Terebinth. Ol.

Acid. Tannic., Alumen, Bryonia, Catechu, Cupri Sulph., Cupri Sulphocarbolas, Erigeron Oleum, Eucalyptus Gum, Ferri Perchlorid., Ferro-Alumen, Hamamelis, Monsel's Solution, Styptic Colloid, Zinci Chlorid. Liq, Amadou.

Hæmorrhage Dental, after Extraction.—*Ergotinine Injection, Ferri Perchlor., Ergota Liq. Extract*, Tannin, *Zinc Sulphate, Zinc Sulphate with Morph. Acet*, Amadou.

Hæmorrhage, Intestinal.—Calcium Chloride, Ergot, Lead Acetate with Camphor or Opium, Acid Gallic, Acid Sulphuric Dil., Supra-renal preps., Turpentine.

Styptic Enemata of Ardrenalin, Alum, Copper Salts, Monsel's Salt, Tannin.

Hæmorrhage, Uterine and Post Partum.—Acid. Sclerotic., Adrenalin, Caffeinæ Inject., Cannabis and Chloral, Cornutine, Ergota, Ergotin inj. hypod., Ergotininæ inj. hypod., Ferri et Quininæ Chlorid., Gossypii Rad. Cort., Hydrastin, Nux Vomica, Opium with Alcohol, Strychnina and Salts, Supra-renal Preps., *Clavin*, Mistura Ergotæ cum Ferro.

Adrenalin, Alumen, Ferri Perchlorid., Gossyp. and Liquor.

Hæmorrhoids.*—Suitable laxatives are Cascara Sagrada preps., Conf. Piper., Conf. Sennæ, Infus. and Mist. Sennæ Co., Pulv. Glycyrrhizæ Co., *Stillingia*, Sulphur (with treacle).

Acid. Boric. Ung., Anusol Suppos., Coninæ Ung., Gallæ cum Opio Ung., Glyc. and Ung. Chrysarobin, Hamamelid. Liq., Ranunculi Ficariæ Ung., Suppos. Bellad. et Morph., Suppos. Cocain et Morph., Suppos. Supra-renal et Morph., Ung. Bismuth et Cocain, Collapsubes—Bismuth, Morph. et Cocain and various (see Index), Bismuth Subiodate, Ung. Thorii Oleat., *Calcium Chloride Injection for bleeding*, Stovaine Ointment, *Eucalyptus Gum Suppositories*, Lotio Plumbi Spirituosus.

Hair, to Remove.—*Barium Sulphide, Calcium Sulphide, Corrosive Sublimate Alcoholic Pigment (with caution). Pigmentum Thymol*, 'X' rays, Electric Needle.

Hay Fever.—Ammonii Chlorid., Anthoxanthum, Arsenic, Belladonna, Camphor, Grindelia, Liq. Ethyl. Nitritis, Potass. Iodid., Quinine preps., Terpene hydrate.

Acid. Salicylic. Pulv., Adrenalin. Bismuth. Co. Pulv., Carbolised Smelling Salts, Carbon. Tetrachlor. Compound Asthma

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* **Ointment Introducers** (Rectal, Allingham's) are square or round in shape, of vulcanite. Pearce Gould's has graduation marks on tube. Urethral Ointment Introducers are also supplied.

A further modification of Allingham's Introducer, consists in the piston being provided with a screw cap. The cap being free, the piston works up and down by pressure, when fixed the piston works only by screwing it round on the cap. A rubber tube is added.—L. ii./03,10.

Fluid, Vapor, Cocain. Hydroch. Liquor, Douche of Mercuric Iodide, 1 *in* 2000, *Eucalypti Oleum, Menthol, Menthol and Camphor, Nebulæ, Pigmentum Antisepticum, Pollantin, Pulv. Lobeliæ Comp., Quininæ Collunarium, Stramonium Fumes, Supra-renal Extract* (*excellent*), *Terebene.*

Headache, Bilious or Sick.—Antipyrine, Chloro-Sodio-Magnesian Aperient, Colalin, Euonymin, Guarana, Hydrastis, Iridin, Phenacetin, Podophyllin, Sodii Phosph. Efferves., Sodii Sulph. Efferves., Sodio-Magnes. Sulph. Efferves., Sodio-Mag. Sulph. with Caffeine.

Headache, Congestive or Inflammatory.—Actæa, Colchicum, Ergot, Ammon. Chlorid., Antimony, Antipyrine, Hydrarg. Sub-chlorid., Ricini Ol., Salicylates of Sodium, &c., *Sedeff,* Veratri Viridis Tinct.

Headache, Nervous.—Acetopyrin, Acid Hydrobromic, Acid. Hydrocyanic., Actæa, Ammon. Arom. Spt., Antipyrine, Apolysin, Arsenic, Auri Bromidum, Belladonna, Bromides, Butyl Chloral, Caffeine, Camphora, Cannabis, Chloralimide, Cimicifugin, Citrophen, Ferri Valerianas, Gelsemium, Guarana, Iodo-Caffeine, Iodo-Theobromine, Iron Salts, Kola, Methylene Blue, Migranin, Nitro-glycerin, Oxidum and Valerianas, Phenacetin, Phenazone, Pilobrom, Quininæ Valerianas, Theine, Virogen, Zinci Lactas, *Elixir Caffeinæ, Sedeff, Syrupus Coffeæ.*

Radium. Exposure to rays of.

Heart.—See **Cardiac Tonics** and **Dropsy, Cardiac.**

Hectic Fever.—Acid. Benzoic. and Benzoates, Acid. Salicylic., Acid. Sulph. Aromat., Agaricus albus and Agaricin, Gelsemium, Phenocoll, Picrotoxin, Quinine preps., Salicin, Salicylates.

Hepatic Colic.—See **Calculi, Biliary.**

Herpes, and Zoster.—Morphinæ inj. hypod. (for pain), Quinine preps., Salines and Saline Aperients,

Amyli Glycerin., Anodyne Colloid, Carron Oil (or mixed with *Zinc Oxide Ointment* 3 : 1), *Cocainæ Ceratum, Collodium,* Cotarnin Ointment, *Hydrarg. Ammon. Ung., Hydrarg. Oleat. Ung., Ichthyol, Menthol pigment or Unguent* (for pain), *Zinci Oleat. Ung., Zinci Ung.*

Hiccough.—Æther. Spt., Amyl Nitris, Camphora, Capsici Tinct., Chloral, Chlorof. Spt., Extract. Ergotæ Liq., Morphine preps., Musk, *Ol. Succini,* Sedeff, Sodii Bicarb., Valerian Tinct.

Hordeolum.—*Argent. Nit., Belladonnæ Fotus, Hydrarg. c. Morphinâ Oleat., Iodi Tinct., Ung. Hydrarg. Oxidi Flavi Ung. Metallorum.*

Hydrophobia.—Anæsthetics, Amyl Nitris, Cannabis Indica and Cannabin, Chloral, Curara, Hydrogen Peroxide, Hyoscine, Hyoscyamine, Morphine, Nitroglycerin, Nux Vomica, Pelletierine, Physostigma and Physostigmine, Pilocarpine, Rabies Antitoxin.

Immediate use of Actual or Electric Cautery, or Nitric Acid or Argent. Nit. Solid, or other caustic paste at hand.

Hyperchlorhydria.—Alkalis, Bismuth, Cerium Oxalate, Glycogen, Nux Vomica (large doses), Pepsin, Sedeff.

Hypertrichosis.—See **Hair, to Remove.**

Hypnotics.—See **Insomnia.**

Hysteria.—Actæa, Amyl Nitris Asafetida, Auri Bromidum Auri Chlorid., Bromal, Calcium, Magnesium, Manganese and other Bromides, Cannabin Tannate. Cannabis Indica, Cephalopin, Cypripedin, Iron Salts, Lupuli Tinct, Nux Vomica, Ol. Succini, Phosphorus, Pulsatilla, Quinine preps., Sedeff, Spirit Ammon. Arom., Strychnine, Sumbul, Valerian and Valerianates, Validol, Zinc Salts.

Impetigo.—Remove crusts with Olive Oil or by Boracised Starch Poultice, then 10% Ammoniated Mercury Ointment; and see **Eczema.**

Impotence.—Arsenic, Auri et Sodii Chloridum, Cannabis Indica and Cannabin Tannas, Cantharides, Coca and Cocaine, Damiana, Easton's Syrup, Ferri Perchlorid., Gokhru, *Muiracithin*, *Muirapuama*, Nux Vomica, Orchitin, Opo-orchidin, Phosphorus, *Pilula Potentin Co.*, Piperazina, Sanguinaria, Spermin, Strychnine, Testicular Extract, Yohimbin, Zinci Phosphid.

Incontinence of Semen.—Antipyrine, Arsenic, Aur. et Sodii Chloridum, Belladonna, Bromides, Camphor Monobromide, Chloral, Ergota, Ferri Perchlorid., Ferri Phosph. and Ferri Phosph. c. Quin. et Strych. Syrup., Gokhru, Hyoscine, Hyoscyamine, Salix nigra, Saw Palmetto.

Incontinence of Urine.—Ammon. Brom., Antipyrine, Arsenic, Belladonna, Calcii Glycerophosph., Calcii Phosph., Camphor. Monobrom., Cantharides, Ergota, Ferri Iodid., Ferri Perchlorid., Gokhru, Hyoscyamus, Lycopodii Tinct., Naphthalin, Nux Vomica, Strychnine (Ringer), Calomel to regulate bowels, Buchu, Potass. Cit., Rhus.

Indigestion.—See **Dyspepsia.**

Infant Feeding.—Milk, Dried (see Foods, Milk Preservation, Pasteurisation), *Koumiss*, *Casein Preparations*, *Sodium Citrate* to add to milk.

Inebriety.—See **Alcoholism.**

Inflammation. — Aconite, Antifebrin, Antimony, Antipyrine, Belladonna, Digitalis, Gelsemium, Granules d'Aconitine, Hydrarg. Subchlorid. and cum Opio, Opium, Quinine, Salicin, Veratrina.

Antiphlogistine, *Cataplasm Salicyl. Co.*, Glycerinum Plumbi Subacet., *Thermofuge.*

Influenza.—Aconite, Acetanilide, Actæa, Ammon. Acet. Liq., Æth. Nit. Spt., Ammoniæ Spt. Aromat., Antim. Tart., Aristochin, Belladonna, Camphor, Cocain. Hydroch. Liquor., Ipecac. Co. Pulv., Inhalations of Eucalypti Ol. Menthol, Menthol and Camphor, Opium and Morphine preps., Phenacetinum, Quinine preps., Salicinum, Salipyrin, Salol, Sodii Salicylas, Tinct. Quinin. Ammon., *Pollantin.*

Insomnia.—Acetanilide, *Aldol*, Ammon. Bromid., Amyleni Hydras, Antifebrin, Antipyrine, Bromal Hydras, Bromidia, Butyl Chloral, Camphor, Cannabis Indica and Cannabin, Chloral, Chloralamide, Chloralimide, Chloralose, Chloretone,

Chlorobrom, Coca, Codeina, Dormiol, Hedonal, Hop pillows, Hyoscyamine, Hypnal, Hypnone, *Isopral*, *Lactucarium*, Liquor Bromo-Chloral Comp., Lupulin, Morphine, Opium, Paraldehyde, Phenazone, *Pilobrom.*, Potassii Bromid., *Proponal*, Scopolaminæ Hydrobromid., *Sed-ff*, Sodii Bromid., Somnal, Stramonium, Strychnina and its salts, Sulphonal, Syrupus cum Narceina, Tetronal, Trional, Ureth-ne, Valer'an, Veronal.

Intertrigo.—*Acid. Boric. and Ung.*, *Acid. Tannic. Glycerin.*, Alphozone, *Bism. Sulpho-Cyanid.*, *Calaminæ Lotio*, *Calcii Carb.*, *Calcis Aqua*, *Camphor*, *French Chalk*, *Fuller's Earth*, Hazel Foam, *Kaolin*, *Lysoform*, *Methylene blue*, *Oleogen Compounds* Pellanthum Preps, Ung. Thorii Oleat, *Vaseline*, *Zinci Cremor and Ung.*, *Zinci Oleat Pulv.*, *Zinci Salicylas*

Intestinal Antiseptics.—See **Antiseptics.**

Intestinal Worms.—See **Parasites, Intestinal.**

Iritis.—Colchicum, Hydrarg. Perchlorid. and Subchlorid., Iodum, Oil of Gaultheria, Potass. Iod., Pilocarpine, Salicylic Acid.

Atropina cum Vaselin., *Atropinæ Sulph. Guttæ and Lamellæ*, *Belladonna*, *Duboisine*, *Dionine*, Scopolamine, *Sterules various.*

Itch.—See **Scabies.**

Jaundice.—Acid. Citric, Acid. Nitro-Hydroch. Dil., Aloes, Ammon. Chlorid., Benzoates, Euonymin, Ferri or Sodii Succinas, Hydrarg. cum Cretâ, Hydrarg. Subchlor., Hydrastis, Iodoform, Iridin, *Manganese Sulphate*, Myricin, Pilocarpine, Podophyllin, Sennæ Co. Mist., Sodii Phosphas and Sodii Phosph. Efferves. Sodii Salicylas, Salol, Sodii Succinas, Sodii Sulphas, and Sodii Sulph. Efferves., Taraxacum. *To relieve skin irritation Dilute Nitric Acid Lotion or Sodium Bicarbonate Solution*, *Liquor Carbonis. Ung. Rusci. Comp.*

Laryngismus Stridulus.—Aconite, Amyl Nitris, Belladonna, Bromides, Chloral, Coninæ Hydrobrom., Emetin, Gelsemium, Piscidia.

Laryngeal Ulcers.—Lactic Acid as pigment and nebula.

Laryngitis, Acute.—Aconiti Tinct. or Pastil., Ammon. Acetat. Liq., and Ammon. Chlorid., Antimonials, Antipyretics, Calomel, Codeine Jelly, Dionin, Glycaphorm, Heroin, Linctus (various), *Lichenoids*, *Melaleuca*, Pulsatilla.

Counter-irritation, *fomentations*, *leeches.* — *Inhalations of Ammon. Chlorid.*, *Sprays of Menthol in Oil*, *Thymol*, *Tinct. Benzoin Co.*, *Belladonna and Conium*, *Juniper*, Æther Acetic.

Laryngitis, Chronic.—Ammon. Chlorid. and Liquorice, Codeine Jelly, Creosote preps. Cubebs, Dionin, Glycaphorm, Heroin, *Lichenoids*, *Melaleuca*, Morphine preps., Pautauberge's Solution, Tar preps., Terebene, Terpin,

Injectio Creosoti or Creosoti Co., *Insufflatio Morphinæ et Bismuth and of Catechu, or Menthol, or Tannin.*, *Pastils of Glyco-gelatin (see list).* *Pigments of Cocaine, Eucaine, Menthol, &c.* *Vapour of Creosote, Eucalyptus Oil, Juniper Oil, Pini Sylvestris Ol, Terebene, Thymol*, Ol. Succini *Liniment.*

Leprosy.—Anacardium, Gurjun Balsam, Gynocardiæ Ol. Leprolin Antitoxic Serum, Tannic Acid.

Leucocythemia.—Acid, Carbolic (inhaled). Arsenical preparations, Cacodylates, Digitalis, Glycerophosphates Hypophosphites, Iodine, Iron Salts, Liquor Ferri Peptonat. Marrubin, Phosphorus, *Syrupus Iodo-Tannicus*, Syrupus Tann-Iodo Phosphoratus, Syrupus Trium Phosphatum, Zinc Phosphide.

Leucorrhœa.—Hæmatoxylon, Iron Salts, Manganese preps., Mineral Acids, Myrrh, Vegetable Tonics.

Abies Canadensis, Acid. Boric. Lotio, Acid. Carbolic. Lotio, Alumen, Ammonio-Ferric Alum, Boric Acid in powder, Hydrastis, Iodates, Lysoform Pessaries, Ovules of Alum, Carbolic Acid, Mercuric Chloride, Naphthol, Quinine Hydrochloride, Tannic Acid; Picratol Suppositories, *Pessus Quiniæ, Potassii Permang., Pulsatilla lotion, Sodii Bicarb. and Belladonna (Ringer)*, Sodii Perboras, *Tannin and Alum Injection, Zinci Sulphocarb., Zinol, Zymocide.*

Locomotor Ataxy.—Acetanilide, Aluminii Chlorid. Antifebrin, Argent. Nit., Argent. Oxid. Morrhuæ Ol., Arsenic, *Cerebrin and Myelin together, Chloral Formamide, Hexamethylene Tetramine*, Mercury Benzoate, Morphine, *Nickel Salts*, Phenacetin, Phenazone, Phosphorus, Potass. Bromid., Potass. Iodid., Quinine, Santonin, Strychnine, *Vesalvine.*

Chloroform on Lint.—Katapboresis of Cocaine Solution, Radium.

Lumbago.—Actæa, Ammon. Chlor., Atropine, Belladonna, Camphor Monobrom, Capsicum, Cimicifugin, Colchicum, Morphina inj. hypod. Ol. Terebinth, Phenazone, Potass. Iodid., Quinine, Sedeff. All Purgatives as Chelsea Pensioner, Guaiacum and Sulphur, Salicylates.

Aconite Liniment, Amyl Salicylate, Apolysin, Atropinæ Linim., Belladonnæ Linim., Capsici Linim., Chloroform Liniment, Heat Rays, *Iodum Oleatum, Iohydrin, Menthol Linim., Menthol Plaster*, Mesotan, Oleogen Camphor, Oleogen Guaiacol, Oleogen Iodi, Oleogen Salicylicum, *Opii Linim.*, Ung. Iodi Intinctum, *Picis. Empl.*, Ung. Antim. Tart., *Veratrinæ Ung.*, 'X' Rays.

Lupus.—Amyli Iodid., Arsenic, Auri Chlorid., Gynocard, Ol., *Hydrargyri Biniodidum*, Iodum, Morrhuæ Ol., *Myelocene*, Phosphorus, Quinine preps., Thyroid gland.

Acid. Chromic., Acid. Cinnamic, Acid Hydrochloric, *Acid. Lactic., Airol*, Bismuth Iodas, *Camphora Salicylata, Ethyl Chloride*, Fibrolysin, *Finsen Light, Gynocardiæ Ung., Hydrag. Nitras*, Ichthyol, *Iodoform*, Isarol, *Lassar's Paste, Lysoform, Lysol, Olrogen Iodi, Oleogen Ichthyol, Oleogen Resorcin, Potassii Cantharidas*, Potassii Permanganas, *Radium, Resorcin*, Thiosinamin, *Tuberculin, Tumenol*, 'X' Rays.

Lupus, Erythematosus.—*Hydrarg. Biniodid, Myelocene, Finsen Lamp, and with Erythrosin, Radium, Salicin, Ung-Thorii, Oleat 'X' Rays.*

Malaria.—*Vide* also **Ague and Fevers.**—Analgen, Arsenic, *Chrysoidine*, Eucalyptus Oil, *Methylene Blue*, Quinin Hydrobrom. injections, Salicin, Salicylates, Urea.

Hydrofluoric Acid inhalations.

Malignant Tumours—See **Cancer.**

Mammary Abscess.—See **Breast, Inflammation of.**

Mania. — Apomorphine, Veronal, and other hypnotics, Atropine, Bromides, Cannabis and Cannabin Tannas, Chloral Hydras, Chloroform, Conine, Diacetyl and Ethyl Morphine, Digitalis, Gelsemina, Hyoscine salts, Hyoscyamine, Morphine preps., Opium preps., Paraldehyde, *Pilobrom*, Sodium Bromide, Sulphonal, Thyroid Gland, Trional.

Marasmus. — Arsenical preps., Lecithin, Iron preps. Meat preparations, Marrubin, Medullary Glyceride, Thymus.

Measles.— Aconite, and Pastil of, Æther Nit. Spt. Ammon. Acet. Liq., Ammon. Carb., Belladonna Tincture, Ipecacuanha, Potass Tart. Acidus.

Melancholia.—Bromides, Brominol, Bromipin, Camphora, Coca and Cocaine, Cannabis, and Cannabin Tannas, Damiana, Musk, Nux Vomica, Phosphorus, *Pilobrom*, Valerianates, *Virogen*.

Menière's Disease.—Acid. Salicylic., Bromides, Gelsemium, Gelsemine, Pelletierine.

Meningitis.—Aconite, Belladonna, Calomel, Iodides, Opium, Veratrum.
Lumbar puncture, Antiseptic Injections, Mercural Injections.

Menorrhagia.—Acid. Gallic., Acid. Sclerotic., Acid. Sulph. Dil., Beberinæ Sulphas, Bromides, Cannabin, Cinnamon Oil, Cotarnine, Digitalis, Ergota, Ergotin, *Erigeron Oil*, Eumenol, Ferro-Alumen, Hamamelis, Hydrastis, Iron Persalts, *Monsel's Solution*, Plumbi Acetas, *Rhus aromatica*, Ruta, Salipyrin, *Styptol*, *Stagnin*, Viburnum, Vinca Major.

Migraine.—See **Headache, Nervous.**

Milk, to increase flow.—Acid. Lactic., *Galactol*, *Ext. Gossypii pulv.*, Jaborandi and Pilocarpine, Malti Ext., Maltolivine, Meat Extracts, Marrubin, Thyroid Gland.
Ricinus Communis, leaves and oil of.

Milk, to arrest flow.—Agaricus albus and Agaricin, Antipyrine, Belladonna and Atropine, Conium, Ergota, Saline Purgatives, Sodii Iodid.
Atropine Breast Discs, Belladonnæ Empl., and Glycerin, or Glycerinum Atropinæ.

Morphine Habit.—Cactus, Camphor, Cocaina, Dionin, Dormiol, Heroin, Hyoscina, Nitroglycerin, Nux Vomica, Sodii Bromidum, Sparteinæ Sulphas, Trional.

Mumps.—See **Parotitis.**

Muscular Rheumatism or **Myalgia.** — Actæa, Ammon. Chlorid., Atropinæ inj. hypod., Cimicifugin, Iron Salts, Morphinæ inj. hypod., Pot. Iodid., Salicylates, Sedeff.
Belladonnæ Glycerin and Linim., Capsici Empl. and Linim., Camphor Liniment and Compound, Clove Oil, Ether Spray, Gaultheria Ointment, Iodi. Linim., Iohydrin, Oleogen Comps., Menthol, Opium (in poultice), Veratrinæ Ung.—See also **Lumbago.**

Myxœdema.—Arsenic, Iron Salts, Jaborandi, Nitroglycerin, Pilocarpine, Strychnine Preps., Thyroid feeding and preps., Virogen, Myhème.

Nasal Catarrh.—See **Catarrh, Nasal.**

Nævi.—*Acid. Chromic., Acid. Nitric., Actual cautery and vaccination, 'X' rays, Collodium, Sodii Ethylas, Zinci Chlorid. Iodid. and Nitras.*

Nephritis, Chronic.—Aconite, *Basham's Mixture*, Buchu, Copaiba, Digitalis with Caffeine, Erythrol Nitrate, Gokhru, Haustus Imperialis, Hordei Dec., Iodo-Caffeine, Iodo Theobromine, Jaborandi, *Koumiss*, Lini. Infus., Pareira, Pot. Nitris, Pot. Iod., Pulv. Potass. Nitrit. Co., (Brunton), Rubus Chamæmorus, Santal. Ol., Scoparius, Sodii Sulphocyanidum, Strontii Lactas, Triticum Repens, Uva Ursi.

Saline Solution injected may prolong life.

Nervous Debility, Nervousness.—Acid. Hydrobromic., Acid. Phosph. Dil., Agurin, Ammon. Bromid., Arsenic preps., Asafetida, Atropine Methyl Bromide, Atropine Valerianate, Antiseptics, *e.g.*, Calomel; Auri et Sodii Chlorid., Bromal, Bromalbacid, *Bromocarpin*, Bromipin, Calcii Bromidum, Calcii Glycerophosphas, Camphora, Cannabis Indica, Coca Wine, Cypripedin, Easton's Syrup, Ferri Glycerophosphas, Ferric Salts, *Ferri Oxalas*, Hæmoglobin Capsules and other preps., Hypophosphites, Ignatiæ Tinct., Lavand. Co. Tinct., Lecithin, Liquor Auri et Arsenii Bromidi, Liquor Auri et Hydrarg. Brom., Magnesii Brom., Maltolivin, Manganes. Bromidum, Marrubin, Ol. Morrhuæ, *Pilobrom*, *Pil. Potentin Co.*, Phosphorus, Potass. Bromid., *Protylin*, Quinine preps., Quininæ Valerianas, Salicin, Scutellarin, Spermin, Strychnine, *Strychnine Valerianate*, Sumbul, Valerian preps., Validol, Valyl, Veronal, *Virogen*, Zinci Valerianas.

Neuralgia.—Acetanilide, Aconite, Actæa, Æther (injected), Ammon. Carb., Ammon. Chlorid., Antipyrine, Arsenic, Aspirin, Atropine Valerianate and Salicylate, Belladonna, Bromides, Butyl Chloral, Caffeine, Cannabina, Chloral-Hydras, Cimicifuga, Cinchonine, Cinchonidinæ Sulph., Colchicine, Conium and Coninæ Hydrobromid., Exalgin, Euphorin, Formanilide, Gelsemium preps., Hyoscyamine, Iron Salts, Liquor Bromo-Chloral Comp., Methylene Blue, Monobromacetanilide, *Muirapuama*, Neuralgic Pills, Nitroglycerin, Phenacetin, Phenazone, Phenocoll, Phosphorus, *Pilobrom*, Quinine preps., Quininæ Hydrobrom., Salicylates and Salol, *Sedeff*, Alcohol Injection (with sometimes cocaine or stovaine added).—L. i./06,1605.

Æthyl Chlorid., Aconiti Linim., Aconitinæ Ung., Belladonnæ Collodium et Tinct. Ætherea, Linim. and cum Chloroform, Chloral Hydras cum Camphor and cum Menthol, Chloroform, Chloroform by Kataphoresis, *Chloroformum Aconiti, Delphinæ Ung.*, Ung. Iodi Intinctum, Iohydrin, *Menthol, Menthol cum Aconitina, Menthol Linim., Menthol Plaster, Methyl Chloridum, Methyl Salicylate, Morphinæ Oleat., Oleanodyne*, Oleogen Camphor, Oleogen Guaiacol, Oleogen Iodi, Oleogen Menthol, Oleogen Salicylate, *Opii Linim.*, Radium, Thorium, *Veratrinæ Ung. All Anodyne Liniments.*

Night Sweats.—Acid. Camphoric., Acid. Gallic., Acid. Hypophosph. and Hypophosphites, Acid. Sulph. Aromat., Agaricus albus and Agaricin, Atropine and inj. hypod., Atropine Methyl-bromide, Belladonna, Calcii Chlorid.,

Codeine, Coto and Cotoin, Guaiacol Carb., Homatropine, Hyoscinæ Hydrobrom., Hypophosphites, Ipecac. Co. Pulv., Iron Salts, Picrotoxin, Quinine preps., Sodii Telluras, Strychnine, Zinci Oxidum.

Nipples, Fissures of, and Sore.—See **Fissures of Nipples.**

Nocturnal Emissions.—See **Incontinence.**

Nymphomania and Satyriasis.—Bromides, Camphor, Conium, Hyoscine, Tabaci Folia.

Obesity.—Alkalis and Alkaline Carbonates, Fucus Vesiculosus, Iodum, Potassii Iodidum, Potass. Permang., Saccharin instead of sugar, Sodii Mag. Sulph. Efferves., Thyroid gland, Iodo-thyrin. Also Aperient Waters, *q.v.*

Œdema.—*Cataplasm Salicyl. Co. Antiphlogistine, Linimentum Pot. Iodi. cum Sapone,* Iohydrin.

Ophthalmia.—See **Conjunctivitis.**

Ophthalmia, Gonorrhœal.—*Argyrol, Collargol, Crédé's Ointment, Ichthargan, Largin.*

Ophthalmia Tarsi.—*Acid. Boric. Lotio and Ung., Glycerini Plumbi Subacetatis Ung., Copper Sulphate. Hydrarg. Oxid. Flav. Ung., Iodoform Ung., Lysoform, Sphagnol.*

Orchitis.—Acetanilide, Anemonin, Antimonials, Pot. Iod. Aconite, Phytolacca. All saline aperients.
Belladonna, Glyc. et Ung., Guaiacol, Iodi Tinct., Oleosa and Ung., Mercurial Plaster.

Otitis and Otorrhœa.—Acid. Sulphanilic., Aconite, Antimonials, Saline aperients, Sodii Sulphanilas.
Aurinaria, see List.
Acid. Boric., Acid. Chromic, Acid. Tannic, Alum Insufflatio, Alum and Bismuth Insufflatio T.H., Argenti Nitras and Bismuth Insuffl. T.H., Calendula, Calomel, Carbonis Detergens Liq. (as Lotion), Chinolin, Cyllin, Dermatol, Ferri Perchlor., Glycerin, Hydrogen Peroxide, *Ichthyol,* Iodates, *Iodi Tinct., Iodoform Wool and Insufflation with Bismuth T.H., Lysoform, Lysol,* Microcidine, *Naphthol, Potass. Permang.,* Proktanin, *Resorcin, Salicylic Acid, Thymol, Turpentine,* Xeroform, *Zinc Chloride.*

Ovarian Pain.—Ammonii Chlorid., Antipyrin, Castor. Tinct., Morphine preps., Pulsatilla, Sumbul Tinct.

Ozæna.—*Acid. Boric. Lot. and Ung., Acid. Carbolic. Buginarium, Aldehydi Vapor, Alumen, Alumin. Acet. Liq., Aristol, Creosoti Vapor, Cupri Sulph. Buginarium, Eucalypti Globuli Infus. and Tinctura, Europhen, Finsen Light, Hydrocotyle Asiatica, Hydrogen Peroxide, Inula Helenium,* Iodates, *Iodoformi Buginarium, Iodoformi Rosat. Ung., Lysoform, Menthol spray and pigment, Potass. Permangan. Lotio, Sanitas (toilet), Sodii Chlorinat. Liq., Sodii Chlorid., Sodii Silic. Sol., Thymaglycin, Thymol Lotio, Zinci Sulphocarb., Zinci Sulphas.,* see *Buginaria.*

Palpitation.—Aconite, Bromides, Cactina, Camphora, Cannabis, Cimicifuga, Convallaria, Digitalis, Valerianates. —See remedies for Dyspepsia.

Paralysis Agitans. — Chloral, *Formates*, Hyoscina, Hyoscyamus, Hypophosphites, Iron Salts, Phosphorus, Physostigma, Strychnine, Sparteine. Certain mineral waters, as Baden-Baden, Teplitz.

Paralysis, Diphtheritic.—Ferri Iodid. and other Iron Salts Nux Vomica, Pepsin, Strychninæ inj. hypod.

Paralysis, Hemiplegia.—Damiana, Ergota, Iron Salts, Nux Vomica, Phosphorus, Physostigma and Physostigmine.

Paralysis, Paraplegia.—Calcium and Sodium, Damiana, Ergota, Hypophosphites of Iron, Iron Salts, Phosphorus, Physostigma and Physostigmine, Rhois Tinct., Strychnine.

Parasites, Animal, on Skin. — *Benzol, Hydrarg. Ammon. Unj., Hydrarg. Oleat., Hydrarg. Oleas c. Sulphure, Hydrarg. Perchlorid. Lysoform, Lotio and Ung.*, Iodates, *Lotio Hydrarg. Acetic*, Lotio Parasiticidus, *Naphthalin Ung., Naphthol Unq., Ol. Cajuput, Ol. Sassafras, Pyrethri Flores Pulv. and Tinct., Sapo Viridis, Staphisagria, Sulphur Baths, Lotion, and Ung., Sulphurated Lime Lotion, Oleatum Hydrarg. um Sulphure, Styrax.*

Parasites, Vegetable, on Skin.—*Acid. Boric., Acid. Carbolic., Acid. Chrysophanic Unq., Acid. Sulphuros.*, Cupri Oleat Ung. (*for favus*), *Formol, Hydrarg. Oleat.*, Lotio Parasiticidus, *Lysoform, Phosphor. Ol., Picrotoxin Pigment., Pyrogallol, Sodii Hyposulphit. Lotio., Thymol Ung.*, 'X' Rays.

Parotitis (Mumps).—Aconite, Antipyrin, Aperients, Iodides, Salicylates, Salines.

Glycerin of Belladonna to neck, Iodine Ointments and Liniments, Thorium Oleate.

Pediculosis Capitis (Lousiness).—*Friction with Paraffinum Liquidum (Toilet Paraffin).—Stavesacre Oil or Ointment, Benzol, Naphthol, Sassafras Oil.*

Pericarditis.—Aconite, Caffeine, Digitalis, Levurine, Mercury preps., Nuclein, Opiates and Musk (to relieve pain), Potass. and Sodii Iodid., Salicylates.

Belladonna Emp. and Liniment, Leeches, Ice, Blisters.

Peritonitis.—Aconite, Antifebrin, Antipyrine, Digitalis, Hydrarg. Subchlorid. cum Opio, Hyoscyamus, Opium, Opium and Belladonna, Veratrum Viride, *Mercury and chalk with Iodoform.*

Turpentine or Belladonna, Stupes or Poppy-head fomentations. For Pelvic,—Collargol Suppository.

Peritonitis, Pneumococcic. See L. i./06,1591

Perspiration, Excessive.—Abies Canadensis, Acid. Agaric., Acid. Phosph. Dil., Acid. Sulph. Aromat., Atropine and inj. hypod., Atropine Methyl-bromide, Belladonna, Ergota, Jaborandi, Pilocarpine, Picrotoxin, Quinine preps.

Amyli Pulv., Diachyli Ung., Emol, Formol, Kaolin, Naphthol ol. in Alc. and Glycerin, Tannin, Zinci Oleat. Pulv. and um Thymol., Zinci Oxid, Zinc Carbonate, Zinc Borate, Pasta Zinci et Amyli, Lysoform.

Perspiration, Fetid.—Mineral Acid and Vegetable Acids (Calcii Sulphas. as in Contrexeville Water) and Tonics.

Acid. Boric. Lotio and Ung., Acid. Carbolic. Lotio and Ung., Acid. Salicylic. Pulv. cum Talco, Aluminii Acet. Lotio, Atropine

or Belladonnæ Linim., Borax, Diachyli Ung., Glycerini Plumbi Subacet. Ung., Iodates, *Lysoform, Tannoform, Zinci Oleat. cum Thymol.*

Pharyngitis.—*Antipyrin Nebula* 3%, *Ung. or Nebula of Menthol* and *Boric Acid to nostrils, Inhalation of Friar's Balsam, Iodine Vapour, Potassium Chlorate Gargle, Sulphurous or Arsenical Waters internally and as Spray*, Silver Nitrate and Zinc Chloride Pigments, *Counter-irritation to neck.*

Phthisis.—Acid. Camphoric., Acid. Cinnamic., *Acid. Coumaricum*, Acid. Fluoric and Ammonium Fluoride inhalations, Acid. Hypophosph. and Hypophosphites, Acid. Lactic. and Lactates, Acid. Phenylacetic., Acid. Phenylpropionic, Allium preps., Arrhenal, Arsenic, Arsycodile, Atoxyl, *Auri Cyanidum*, Benzoates, Cacodylates, Calcii Chlorid., Calcii Hypophosph. and Phosph., *Cinnaldehydum (painful), Cinnamyl-Metakresol*, Creosoform, Creosoti Carbonas, Creosoti Valerianas, Creosotum, *Cupri Acetas*, Dionin, *Durant's Injection, Elixir Arsinyl*, Elixir Creosoti, *Elixir Sodii Formatis*, Emulsio Ol. Morrhuæ et Hypophosphitum, Emulsio Petrolei, Eucalypteol, Ferrated Cod Liver Oil Emulsion, Formaldehyde Inhalant, Glycerophosphates, *Griserin*, Guaiacol, Guaiacol Cacodylas, Camphoras, Carbonas, Cinnamas, or Phosphas, Guaiacol-Salol, Heroin, *Histosan*, Ichthyol mixture, Capsules, etc., Iron Salts, Lachnanthes, Lecithin, Liq. Arsenic. Cinnamylic., Lofotol, Maltolivine, Marrubin, Oleo-Creosote, Oleum Morrhuæ, Ol. Morrhuæ c. Creosoto, Ol. Olivæ cum Acido Oleic, Ovolecithin, Oxygen, *Palladium Chloride*, Pancreatin, Pepsin, Phenol Sodii Sulpho-Ricinas, Piscidia, Prunus Virginiana, Quinine preps., *Quinine Arrhenalate, Radium Comps.*, Resorcin (Laryngeal), Salicin, *Sodii Fluoridum*, Sodii Hypophosph., Somatose, *Strontii Cinnamas*, Sugar Feeding, *Syr. Iodo-Tannic, Syrupus Potass. Cyanid.* (for cough), Thiocol, *Thorium Comps.*, Tuberculin Old, Tuberculin R., *Tylmarin*, Urea, Vanadates, Vapor Guaiacol Compositus, Verbascum Thapsus, Yeast Preparations, *Nuclein.*

See also Opsonins, p. 786.

Piles.—See **Hæmorrhoids.**

Pityriasis.—*Acid Boric. Lotio. and Ung., Acid. Chrysophanic Ung., Boracis Glycerin. and Lotio, Glycerini Plumb. Subacet Ung., Gynocardiæ Ung., Huile de Cade, Lotio Resorcini, Picis Ung., Empyroform.*

Plague, The.—Acid. Carbolic, Antitoxic Serums of Haffkine and Yersin, Adrenalin, Lustig's Vaccine.

Pleurisy.—Aconite, Ammon. Acet. Liquor, Antimony, Apocynum cannabinum (for Pleuritic effusion), Bryonia, Jaborandi, Morphine preps., Potass. Iodid., Pyranum, Quinine preps., Sodii Salicylas, Veratrum.

Antiphlogistine, Blisters, Cataplasm. Salicylic. Co., Iodates by injection for empyema, *Thermofuge.*

Pleurodynia.—See **Myalgia.**

Pneumonia.—Acid. Salicylic., Aconite, Ammon. Carb. and Chlorid., Antimony, Belladonna, Caffeine, Chloral and Digitalis, Creosoti Carbonas, Creosote combined with Potassium Iodide, Digitalis, Guaiacol, Heroin, Hyoscyamus,

Hypophosphites, Liquor Ferri Acetatis, Morphine preps., Normal Saline Solution, Phenazone, Pilocarpin, Quinine preps., Salines, Veratrum viride, *Antipneumococcic Serum, Saline transfusion,*

Antiphlogistine, Cataplasm. Salicy. Co., Oxygen, Thermofuge.

Poisons.—See **Antidotes** under each heading in the text, and **Emetics.**

Post-Partum Hæmorrhage.—See **Hæmorrhage.**

Pregnancy, Vomiting of.—Aconite, Antipyrine, Arsenic, Belladonna, Bismuth preps., Cerii Oxalas, Chloral, Chloroform, Iodides. Cocaine, *Sedeff, Corpora Lutea,* Creosote, Hydrocyanic Acid, Ingluvin, Ipecac. Vin., Iridin, Menthol, Morphine preps. and inj. hypod., Nux Vomica, Pepsin, Quinine preps., Spt. Nucis Juglandis.

Prurigo.—Arsenic, Bromides, Cantharides, Iron Salts, Pilocarpine, Quinine preps., Quinine Lygosinate, Thorium Salts.

Acid. Boric. Lotio and Ung., Acid Carbolic. Lotio and Ung., Acid. Oxy-Napthoic., Borax, Cocainæ Ceratum, Ichthyol. Iodoformi Ung., Liq. Ammon. Dilut., Liq. Hydrarg. Perchlor., Liq. Plumbi Subacet. Dilut., Lysoform, Oleogen Comps., Pilocarpine, Staphisagria, Sulphur Ung., Tar, Ung. Rusci. Co., Ung. Sulph. cum Hydrarg., Anderson's Ointment.

Pruritus Ani, Vulvæ, &c.—*Acid. Carbolic. Lotio and Ung., Acid. Salicylic. Ung., Acid Sulphuros. Lotio, Alkalis (Lotion of), Alum Lotion, Argenti Nit. in Sp. Aether Nit., Calomel dusted on, Bismuth Subiodate, Bismuth subnit, Carbonis Liq. Lotio., Chloretone, Chloroformi Ung., Cocain, Cocainæ Ceratum, Conii Ung., Epicarin, Eucaine, Gallæ cum Opio Ung., Glycerini Plumbi Subacet. Ung., Hydrarg. Oleat and cum Morphinâ, Hydrarg. Subchlorid. Ung., Lotio Nigra, Lysoform, Mentholeate, Menthol et Boracis Lotio.,* Anderson's Ointment, *Hydrastis Liquid Extract and Hamamelis injected Orthoform, Potass. Cyanid. Lotio.,* Sodium Thiosulphate, *Tannin,* Thiol preps., *Carbolic and Cocaine Lotion, Naphthalin Ointment and Suppos., Ung. Rusci. Co.*

Psoriasis.—Arsenic preps., Cacodyl preps., Cantharides, Granula Dioscoridis, Gynocardiæ Ol., Hydrarg. Iodid. Viride, Iron Salts, Morrhuæ Ol., Levico Water, mild and strong, Phosphorus, Pil. Asiatica, Quinine preps., Resinol, Sulphur.

Acid. Carbolic Ung., Acid. Chrysophanic Ung., Acid. Pyrogallic Ung., Acid. Salicylic Ung., Anthrarobin, Aristol, Betulæ Pyrolig. Ol., Carbonis Liq. Lotio, Epicarin, Eugallol, Eurobin, Europhen, Fagi Pyrolig. Ol., Gallacetophenone, Gynocardiæ Ol., Huile de Cade and Ung., Hydracetin, Hydroxylamine, Ichthyol, Ichthyol Resorcin and Salicyl, Iodates, *Lanoline, Lenigallol, Lenirobin, Liquid Iodoform Soap, Lysoform, Mollin, Naphthol, Picis Ung., Potass Sulphurata, Rusci Pyrolig. Ol., Sulphides (in Baths), Sulphuris Hypochloritis Ung., Salophen, Ung. Empyroform, Thio-Resorcin,* Thorii Oleat Ung., Quinine Lygosinas, *Thymol Iodide, Ung. Acidi Pyrogall. Oxidat., Ung. Rusci Co.,* Ung. Iodii Intinctum.

Ptyalism.—See **Salivation.**

Puerperal Fever.—Acid. Boric, Antifebrin, Antipyrine, Anti-Streptococcic Serum, Ferri Perchlorid., Jaborandi,

Pilocarpine, Opium, Quinine, Terebinth. Ol., *Nucleinic Acid*, Veratrum.

Vaginal Injections of Sal Alembroth, or Mercuric Iodide Solution, or of Cyllin.

Purgatives.—See **Constipation.**

Purpura.—Acid. Citric., Acid. Gallic., Acid. Sulphuric. Dil., Calcii Chloridum, Ergota, Iron Salts, Lime Juice, Phosphorus, Quinine preps., Terebinthinæ Oleum.

Pyelitis.—Benzoates, Benzoic Acid, Collinsonia Canadensis, Erigeron Oil.

Pyrexia.—See **Fever.**

Pyrosis.—Acid. Hydrocyanic., Acid. Hydrochlor. Dil., Acid. Nit. Dil., Acid. Sulphuros., Bismuth preps., Carbo Ligni, Cerii Oxalas, Magnesia, Sodii Bicarb., Sodii Sulphocarbolas, *Atropine methyl bromide.*

Quinsy.—See **Pharyngitis, Throat Inflammation.**

Remittent Fever.—Apiol, Eucalyptus Globulus, *Eupatorium*, Quinine and other Cinchona Alkaloids, Salicin, Salicylates, Salol, Warburg's Tincture, *Mistura oleo-Balsamica.*

Rheumatism, Acute.—Acid. Aceto-Salicylic, Acid, Benzoic and Benzoates, Acid. Salicylic and Salicylates, Acetanilide, Acetopyrin, Aconite, Actæa and Cimicifugin, Antifebrin, Antipyrine, Asaprol, Aspirin, Caffeine-Chloral, Colchicum and Colchicin, Ferri Perchlorid., Fluor-rheumin, Formanilide, Guaiacum, Lactophenin, Lemon or Lime Juice, Lithion, Maretin, Methyl Salicylas, Opium, Ozonic Ether, Phenazonum, Phenocoll Hydrochlor., Potass. Acetas, Bicarb. Cit. or Nit., Quinine preps., Rubidium Iodid., Salmin, Salicylamide, Salipyrin, Salol, Salocoll, Salophen, Sodii Bicarbonas, *Tylmarin*, Veratrum, *Cocaine Ionisation.*

Rheumatism, Chronic.—Acid Citric, Acid Hydriodic and Iodic, Actæa, Amyl Salicylas, Antim. Sulphurat., Arsenic, *Articular Extract*, Aspirin, Chloral with Camphor and Menthol, Cimicifuga, Cinchonidinæ Salicylas, Citarin, Colchicum, Conf. Guaiaci Comp., *Euphorin*, Ferri Iodid. Syr., Ferri Salicylas, Fluor-rheumin, *Gaultheriæ Oleum*, Gelsemium, Granular Eff. Piperazine and Phenocoll, Ichthyol, Ichthyol Salicylate, Lithii Hippuras, Lithion, Lycetol, Methylene Blue, Menzer's Serum, Naftalan, Ol. Morrhuæ, Pelletierina, Phytolaccin, Pilocarpina, Piperazina, *Piperazin Glycerophosphates*, Piperidin preps., Podophyllin, Potass. Iodid. and cum Quininâ, Pyranum, Rhus, Safrol, Saligenin, *Sarsaparilla preps.*, Sodii Boro-Salicylas, Succini Ol., Sulphur, Ulmaren, Uricedin, Ursal, Vanadates, *Vesalvine*, Xanthoxylum.

Atropinæ Linim., Bellad. Linim. and Linim. Co., Belladonna Chloroformum and Tinct. Ætherea, Betol, Camph. Co. Linim., Capsici. Emp. and Linim., Chloral cum Camphor., Caffein and Sodium Salicylate injected, Croton Oil Liniment; Eucalyptus Oil, Gaultheriæ Oleum, Gyrol Pencils, Iodine, Kataphoresis of Cocaine Solution and Chloroform, *Mesotan*, Methyl Salicylate *and Plaster* and Ung., Oleogen preps., *Opii Linim., Pin Sylvest. Oleum*, Potassii Lactas, *Salit, Sassafras Oil, Ulmaren* **Unguentum Iodi Intinctum.**

Rheumatoid Arthritis. — Actæa, Arsenic, Aspirin, Colchicum, Ferri Iodid., Guaiacol Carbonate, Lithii Carb. and Citras., Morrhuæ Ol., Potass. Bromid. and Iodid., Quinine Salicylas, Thyroid preparations.
Radiant Heat, Sulphides (baths of), 'X' Rays.

Rhinitis.—See **Catarrh, Nasal.**

Rickets.—Acid. Phosph. Dil., Calcii et Ferri Phosph. Pil. Calcii Hypophosph. Syrup., Calcis. Liq. Sacch., Calcii Chlorid., *Lactas*, Phosph., Lactophosph., Syr. and cum Ferro, Capsulæ Cruoris, Cinchona preps., *Cupri Arsenis*, Emulsio. Ol. Morrhuæ cum Glycerophosph., Ferratin, Ferri Phosph. Syr. and Comp., Ferri Iodidum, Ferri Vinum, Glycerophosphates, *Glycerol Glycerophosphatum cum Medulla Rubra*, Liq. Ferri Hypophosph. Comp., *Maltolivine*, Marrubin, Morrhuæ Ol., Ol. Morrhuæ Phosphoratum, Phosphorus, Plasmon, Sanatogen, Somatose, Sodii Phosphas, Thymus Gland, Saccharated Wheat Phosphates, *Virogen*, Zinc Phosphide.

Ringworm.—See **Tinea.**

Saint Vitus's Dance.—See **Chorea**

Saliva, to promote. — Ether, Ginger, Horseradish, Iodides, Jaborandi, Mercurials, Most Emetics, Mustard, Pelletierine, Pepper, Physostigma, *Pyrethrum*, *Glyco-gelatin (Pastils of)*, Tobacco.

Saliva, to check excessive.—Acid. Hydroch. Dil., Atropine and Belladonna, Chlorates, Coto, Picrotoxin.
Acid. Boric., Alumen, Borax, Chlorates, Creosoti Vapor, Lysoform.

Sarcinæ.—Acid. Sulphuros., Calcii Chlorid., Betanaphthol, Salol, Sodii Hyposulphis, Sodii Sulphis, Sodii Salicylas.
Lavage.

Scabies.—*Acid. Oxy-Napthoic, Calcis. Sulphurat. Lotio, Cyllin, Epicarin, Hydrarg. Perchlorid. Ung., Liq. Carboni Detergens, Lysoform, Napthalin Ung., Naphthol Ung., Pigmentum Thymol, Potass. Sulphurat. Balnea, Stryacis Ung., Sulphur Ung., Sapo Viridis, Ung. Rusci Co.*, Ung. Thorii Oleat.

Scalds.—See **Burns.**

Scarlatina.—Acid. Salicylic., Aconite, Ammon. Carb., Antidiphtheritic Serum, Antistreptococcic Serum, Belladonna, Ozonic Ether, Potassii or Sodii Chloras, Eucalypti Tinctura.

Scar Tissue.—To relax and remove. From gullet, stomach, also uterine adhesions.—*Thiosinamin*, Fibrolysin.

Sciatica.—Acetanilide, Acetopyrin, Actæa and Cimicifugin, Agathin, Agurin, Alphol, Codein Sulphas., Colchicum and Colchicin, Conf. Guaiaci Comp., Lithii Citras, Methylene Blue, Morphinæ inj. hypod., Phenazone, Piperazine, *Piperazine, Glycerophosphates*, Potass. Iodid., Potassii Osmas, Pyranum, Quinine Salicyl., Salol, Sodii Salicylas, Strychnine, Terebinthinæ Ol., *Tylmarin*, Uricedin.
Aconitinæ Ung., Bellad. Linim., Chloroform Linim., Cocaine Ionisation, *Ether Spray, Ether injection*, Iohydrin, *Menthol*,

Menthol cum Camphora, Menthol Linim., Methyl Chloridum, Ol. Betulae, Oleogen Camphor, Oleogen Guaiacol, Oleogen Salicyl., Radiant Heat, *Veratrinæ Ung.*, 'X' Rays.

Scrofula.—Barii Chlorid., *Bismuth and Zinc Iodates,* Calcii Chlorid., Calcii Hypophosphis, Calcii Phosph., Calcii Sulphid., Calcinol, *Extract. Malti cum Iodinol,* Ferratin, Ferri et Calcii Phosph. Pil., Ferri Iodid. Syr., Ferri Phosph., Hydrarg. Iodid. Virid., Iodoform., Iodum., Maltolivin, Marrubin, Morrhuæ Ol., Morrhuæ Ol. Emuls., Ol. Olivæ c. Acid Oleic., Potassa Sulphurata, Quinine preps., Sodii Phosphas, Solveol, *Syrup. Iodo-Tannic, Syrupus and Vinum Tann-Iodo-phosphoratus,* Thorium Salts.

Scurvy.—Arsenic and Iron, Lime Juice, Lemon Juice, Phosphorus, Potass. Chloras and Citras, Sassafras.

Sea-Sickness.—Acid. Hydrobromic., Antipyrine, Amyl Nitris, *Atropine Drops in one eye,* Bisedia, *Bon Voyage,* Brometone, Chloralamide, Chloral Hydras, Chlorobrom, Chloroform and Tinct. Co., Cocainæ Hydrochlorid., Cocaine tablets and solutions, Eucalypti Troch., Hyoscine, Hyoscyamina, Morphinæ inj. hypod., Nitroglycerin Tablets ($\frac{1}{200}$ gr.), Orexine Tannate, Phenazone, Potass. Bromid., Sedeff, Sodii Bromid., Sodii Nitris.

Counter-irritants to stomach, Ice-bags to the spine.

Seborrhœa. — Locally — *Captol, Lysoform Ointment,* Resorcin Lotion and Ointment, Sulphur and Salicylic Acid Ointments, Thigenol, *Thorii Oleatum.*

Septicæmia and Pyæmia.—Acid. Salicylic, Anti-Streptococcic Serum *and Vaccine, Antistaphyloccic Vaccine, Echinacea,* Eucalyptus Globulus, Ferri Perchlor., Kairine, Levurin, Nuclein, Quinine preps., Resorcin, Salicin, Sulphites.

Shingles.—See **Herpes Zoster.**

Shock, Surgical.—Adrenalin, Brandy hypodermically, Ergot, Ether, Morphine, Saline transfusion, Suprarenal Extract, Strychnine.

Sickness.—See **Vomiting.**

Skin Diseases.—See **Eczema, Psoriasis, &c.**

Sleeping Sickness.—See **Trypanosomiasis.**

Sleeplessness.—See **Insomnia.**

Snake-bite.—See **Bites and Stings.**

Spasm.—Aconite, Æther, Ammon. Arom. Spt., Amyl Nitris, Atropinæ inj. hypod., Cajuput. Ol., Camphora, and Camphor. Spt. Fort., Chloroform, and inhaled, Chloromorphiæ Liq., Conina, Erythrol Nitrate Tablets, Mannitol Nitrate Tablets, Menth. Pip. Ol., Mistura Ætheris cum Ammonia, Opium, Piscidia.

Spermatorrhœa.—See **Incontinence of Semen.**

Spina Bifida.—*Iodine Liniment, Iodo-Glycerin injection.*

Sprains.—*Arnica, Fomentations (hot) of Poppy-head or Belladonna, or cold with vinegar, or spirit lotions, Lead and Opium Lotion, Lotio Ammonii Chloridi.* When chronic, *Liniments of Belladonna, Chloroform, Camph. Co., Lin. Tereb. Acet., Radiant Heat, 'X' Rays.*

Sprue.—Castor Oil, Cyllin, Koumiss, Milk diet, Pepsin, Santonin: Locally—Lysoform, Thorium Salts.

Stings.—See **Bites.**

Stomatitis.—Eucalypti Globuli Tinct., Hydrastis, Potassii Chloras, Sodii Chloras.

Acid. Boric., Acid. Carbolic, Acid. Salicylic, Acid. Sulphuros, Alumen, Borac. Glyc. and Mel., Calcis Aqua, Collutoria (see Index), *Cupri Sulph., Hydrogen Peroxide, Lysoform Mouth Wash, Myrrhæ et Boracis Tinct., Sodii Chloras.* — See **Pastils.**

Styptics.—See **Hæmorrhage.**

Sunburn.—See **Freckles.**

Sunstroke.—Ammon. Carb., Apomorphina, Atropinæ inj. hypod., Digitalis, Ergot, Morphinæ inj. hypod., Quinine, Veratrum.

Purgative enemata, Sinapis Emplastrum.

Sycosis.—*Ichthyol, Liq. Hydrarg. Perchlor., Sulphur,* Ung. Cupri Oleat 10%, *Ung. Hyd. Ammon., Ung. Hydrarg. Nit.,* Ung. Hydrarg. Sulph. Flav., 'X' Rays.

Syphilis, Constitutional.—Ammon. Iodid., Amyli Iodid., Auri Chlorid., Barii Chlorid., Carbolas, Condurango, Ferri Iodid. Syrup, Hydrarg. cum Cretâ, Hydrarg. Cyanid. Pil., Hydrarg. et Potass. Iodid., Hydrarg. Gallas, Hydrarg. Iodid. Rub., Hydrarg. Iodid. Viride, Hydrarg. Perchlorid., Hydrarg. Pil., Hydrarg. Subchlorid., Hydrarg. Salicylas, Succinimidum and Thymolacetas, Tannas, Hydriodol, Iodalbacid, Iodinol, Iodum, Manaca, Hydrargyri Benzoas, Mercurol, Phytolacca, Potass. Iodid., Quinine Periodide, Rubidii Iodid., Sarsaparilla preps., Sodii Iodid., Stillingia, Strontii Iodidum, Succus alterans, Syrupus Acidi Hydriodici. (*See* **Mercurial Injections** *for latest Hypodermic and Intravenous treatments.*)

Hydrargyri Lanolinum, Hydrarg. Oleat. and cum Morphinâ Hydrarg. Ung., Kataphoresis of Potassium Iodide, and of Lithium Iodide Solutions. Ung. Prophylaxis (capsules of) Metchnikoff L.i/06,1629.

Syphilis, Skin Diseases.—*Europhen, Hydrarg. Ammon. Ung., Hydrarg. Emplast., Hydrarg. Nit. Ung., Hydrarg. Oleat., Hydrarg. Perchlorid. Ung., Hydrarg. Subchlorid. Fumigation and Ung., Hydrarg. Ung., Iodoformi Gossypium and Ung.,* Iodates, *Iodinol, Resorcin,* Thiol.

Syphilitic Sore Throat.—*Alum Garg., Borax Garg. and Mel Boracis, Chlorine or Sodii Chloras Garg. and Troch., Hydrarg. Cyanid. Garg., Hydrarg. Perchlorid. Garg. and Pastil., Insufflatio Iodoformi Comp. and Pastil., Potass. Chlorat. Garg., Pastil. and Troch.*

Syphilitic Ulcers.—*Acid. Chromic., Aristol, Collod. Salicylic. c. Hydrarg. Perchlor., Di-iodo-thio-resorcin, Dusting powder of Calomel and Bismuth, Europhen, Hydrarg. Acid. Nit. Liq., Hydrarg. Flava and Nig. Lotio,* Hydrarg. Iodas. *Hydrarg. Naphthol, Hydrarg. Oleat. and cum Morphina, Hydrarg. Subchlorid., Iodoform, and Collodium cum Iodoformo*

Iodoform Wool, Iodoformi Ung., Iodol, Resorcin, Thio-resorcin. Zinci Chlorid. Iodid. and Nitras, Calcii Iodidum (internally), —B.M.J. ii./06, 138.

Tabes Dorsalis.—See **Locomotor Ataxy.**

Tachycardia.—Amyl Nitrite, Atropine, Cactus, Convallaria, Digitalin, Nitroglycerin, Sparteine, Strychnine.—*See also* B.M.J.ii./04,109.

Tænia.—See **Parasites, Intestinal.**

Tetanus.—Acid. Carbolic., Anæsthetics (to relax spasm), Antitoxin, Amyl Nitris, Bromides, Cannabis, Chloral Hydras, Coninæ Hydrobromid., Curara, *Eucaine Lactate,* Gelsemium, Hydrogen Peroxide, *Intracerebral injections,* Liquor Arsenicalis, Magnesium Sulphate or Sodium Chloride injections, Morphine, Opium, Pelletierine, Phenol inj. hyp., Physostigmine, Pilocarpina, Strophanthus, Urethane.

Thirst, to Relieve.—Acid. Citric., Acid Drops, Acid. Phosph. Dil., Acid. Sulph. Aromat., Acid. Tartaric., *Ammonium Iodide,* Coca, Elixir Acid., Haustus Imperialis, Pot. Chlor. Tablets, Pot. Cit., Potass. Tart. Acidus.

Throat, Inflammation of, and Tonsillitis.—Acid. Salicylic., Aconiti Tinct. and Pastil, Antimony, Antipyrine, Belladonna, Ferri Salicylas, Guaiacol, Jephson's powder, *Lichenoids,* Liq. Ferri Perchlor, Quininæ Salicylas, Salicylates, Sodii Benzoas, Solubes (various), see Index.

Benzoin. Tinct. Vapor, Chlorates in Troch., Cocaine (Pigment of), Formalin Pigment, Guaiacum Trochisci, Iodi Vapor, Monsel's Solution, Thymaglycin, Juniperi Ol. Vapor.

Throat, Relaxed Sore.—

Acid. Carbolic. Pastil., Acid. Tannic Garg. and Glycerin., Alumen and Glyc. Aluminis, Ammonii Chloridi Vapor, Argent. Nit., Benzoin. Tinct. Vapor, Bismuth. Pastil., Catechu Insuffl., Eucalyptus Gum Insuffl., Ferri Perchlorid., Pigment., Ferro. Alumen, Geranium Ext. in gargle or pastil, Guaiaci Troch., Hydrastis Tinct. and Rhus Tinct. or as gargle, Lichenoids, *Pini Sylvest. Vapor, Uranii Nitras, Solubes (various),* see Index.

Thrush.—See **Aphthæ.**

Tinea Favosa and Sycosis.—*Acid. Carbolic. Glycerin, Acid Sulphuros, Anacardium, Croton Oil (Alder-Smith), Chrysarobinum,* Cupri Oleat. Ung., *Formaldehyde, Hydrarg. Oleat.* Hydrarg. Iodas, *Hydrarg. Perchlorid. Lotio., Iodi Linim, Lanoline,* Nicotinæ Salicylas, *Picrotoxin Pigment, Pyrogallol,* Resorcin, *Sodii Hyposulphitis Lotio,* 'X' Rays.

Tinea Tarsi.—See **Ophthalmia Tarsi.**

Tinea Tonsurans and Circinata.—As for **T. Favosa** and—*Anacardii Oleum, Anthrarobin, Cantharid. Pigment, Chrysarobin. Coster's Paste,* Cupri Oleas, *Formaldehyde, Hyd. Oleat. Ung., Hydrarg. Nit. Acid. Ung., Hydronaphthol Plaster, Iodi et Olei Picis Pigment., Iodized Phenol,* Iohydrin, *Izal, Lysoform, Pyrogallol,* Sphagnol, *Salicylic Acid, Sulphur, Ung., Hyd. Iodid. Rub., Ung. Potass. Sulphurat.,* 'X' Rays.

Tinea Versicolor.—*Acid. Chrysophanic., Acid. Sulphuros. Borac. Glycerin., Formaldehyde, Gynocard. Ol., Lotio Calcii Sulphurati, Sodii Hyposulph. Lotio.*

Toothache.—Acid. Hydrobromic, Butyl-Chloral Hydras Delphinine, Gelsemina., Gelseminæ Hydroch., Gelsemii Tinctura Morphinæ inj. hypod., Piscidiæ Ext. Fluid., Quin. Tinct Ammon.

Acid. Arsenios., Acid. Carbolic. with Collodion, Butyl-Chloral cum Menthol, Caryophyll. Ol., Chloroform cum Camph., Chloroform cum Mastic, Cocaina, Creosotum, Eugenol, Iodi et Aconiti Tinct., Liq. Sodii Carbolatis, Menth. Pip. Ol., Opii Tinct., Pasta Arsenicalis, Potassii Permanganas, Pyrethri Tinct., Resina Carbolica, Sodii Peroxidum.

Tonsilitis.—See Throat and Pharyngitis.

Toxæmia.—Alcohol (Brandy Sterules) hypodermically, Ether, Purgatives, Diuretics, Jaborandi, Sal Volatile Stimulants, Strychnine.

Trichinosis.—Ergota, Ergotin, Sclerotic Acid, Liquor Arsenicalis.

Trypanosomiasis and Tick Fever. — *Antitoxic Serum*, Arsenic (Sodium Arsenate), *Atoxyl, Chrysoidine, Malachite Green, Methylene Blue, Trypanroth.*

Tuberculosis.—See Phthisis.

Tuberculosis, Laryngeal.—See B.M.J.ii /05,1188.—*Acid Lactic Spray or Pigment, Borax, Borax and Opium Gargle, Boric Acid Insufflated, Cocaine (Lozenges and Spray), Iodoform, Iodol, Iodine Inhalation, Menthol 20% in Olive Oil, Morphine, Orthoform Insufflated, Pastils of Cubebs, Potassium Chlorate or Ipecac., Silver Nitrate Spray, Vapor Olei Pini Sylvestris.*

Typhoid Fever.—Acid. Salicylic. and Salicylates, Ammon. Carb., Anti-Typhoid Inoculation, Aristochin, *Cinnamon Oil*, Carbolic Acid, Cinchona Alkaloids, Eucalypteol, Eucalyptus Globulus, Hydrarg. Naphtholacetas, Subc lor. and Perchlor. Hydrogen Peroxide, Iodopyrin, *Iodates, Kryogenin, Magnesii Salicylas*, Mistura Chlori cum Quinina, Naphthalene, Naphthol, Olive Oil. Quinine, Salol, *Sodii Acid. Sulph. as water disinfectant*, Sodii Chloras, Soda Chlorinata, Sulphurous Acid, Thallin, Thymol, Tribromophenol, Turpentine Oil, Zinc Sulphocarbolate, Guaiacol.—Notes on Treatment, *see* B.M.J. i. /05,415.—Hæmorrhage, Intestinal from: Calcium Chloride, *Crocq's Pill*, Argenti Nitras, Ergot, Pil Plumbi Acetatis cum Opio.

Ulcers.—*Acid. Boric. Lotio and Ung., Acid. Carbolic. Lotio and Ung., Acid. Salicylic. Gossypium and Ung., Actol, Argent. Nit., Belladonnæ Glycerin., Bismuthi Oxyiodid., Carbonis Cataplasm., Chartazinc, Collodium*, Cupri Acetas, *Cupri Oleat. Ung., Sal Alembroth gauze, Eucalypti Ung., Eucalyptus Sawdust, Fermenti Cataplasm., Hamamelis, Hetocresol, Hydrogen Peroxid.*, Iodates, *Iodoform, Iodol, Itrol, Izal*, Linimentum Æruginis, *Lysoform, Naphthalin, Orthoform, Oxygen, Plumbi Subacet. Glycerin. and Ung., Potass. Permang., Potassium Permanganate Pencils*, Quinine Lygosinate, *Resinæ Ung. and Res. Ung. cum Chlorof., Resorcin, Salol, Sanitas, Sanoform, Solutol, Ung. Pheno-Boric*, Ung. Thorii Oleat., *Zinci Chlorid., Zinci Oleat. Ung., Zinci Sulph. Lotio.* Calcii Chloridum (internally), 15 grs., *t.d.s.*—*See* B.M.J. ii./05, 138.

Uric Acid Diathesis.—See Gout, Rheumatism.

Urinary Calculi.—See Calculi.

Urine, Incontinence of.—See Incontinence.

Urine, Tests for Albumin.—See page 828 *et seq.*

Urine, Tests for Sugar.—See page 842 *et seq.*

Uræmia.—Aconite, Amyl Nitris, Apocynum Cannabinum, Atropine, Bromides, Caffeine, Digitalis, Elaterin, Pulv. Co., *Erythrol Nitrate*, Hydrarg. Subchlor., Jaborandi and Pilocarpine, Jalapæ Pulvis Co., Lithii Hippuras, Nitroglycerin, Saline Purgatives, *Saline Solution*, Scilla, Scoparii Succus, Sodii Benzoas, Thialion, Urosin, Veratrin.

Uræmic Convulsions.—Bromides, Chloral, Chloroform, Jaborandi, Morphine, Pilobrom. Saline Solution may prolong life.

Urticaria.—Antipyrine, Apis Mellificæ Tinct., Bromides, Cream of Tartar, Magnesia Cream, Mistura Alba, Sodii Bicarb., Sulphur.

Acid. Benzoic. Lotio, Acid. Boric. Lotio, Acid. Carbolic Lotio, Acid. Hydrocyanic Dil. Lotio, Bromocoll, Chloroform. Ung., Cocainæ Ceratum, Plumbi cum Lacte Lotio, Sodii Carb. Balnea, Zinc and Starch Powder.

Uterus, Catarrh of.—See Catarrh, Uterine.

Uterus, To cause Contraction of.—Borax, Caulophyllin, Cimicifuga, Cornutine, Ergota, Ergotin, Ergotinine, Gossypii Rad. Cortex., Hamamelis, Hydrastis, Sclerotic Acid, Ustilago Maidis.

Uvula, Relaxed.—*Gargles of Alum, Capsicum Tinct., Catechu, Ferric Chloride, Kino, Pigment of Glycerol of Tannin, Potass. Chloras, Rhatany, Kino or Tannin Lozenges, Zinc Sulphate* or *Zinc Chloride Gargle and Pigment.*

Vasodilators.—Amyl Nitrite, Benzoates, *Cinnamates, Coumarates*, Erythrol Nitrate, Hippurates, Mannitol Nitrate, Nitroglycerin, Thyroid Extract.

Variola, To prevent pitting.—*Acid. Boric. Ung., Acid. Carbolic Ol., Amyli. Glyc., Argent Nit., Calcis Linim., Collodium, Finsen Red Light, Hydrarg. Ung., Phenol pure, Styptic Colloid., Zinci Oleat. Ung.*

Venereal Diseases.—See Syphilis, Gonorrhœa, Chancroid.

Vertigo. — Acid. Hydrobromic, Ammon. Spt. Arom., Auri Bromid., Caffeine, Guarana, Quininæ Valerian., Strychnine, Zinci Valerianas.

Vomiting.—Acetanilide, Allium Juice, Arsenic, Acid. Carbolic, Acid. Hydrocyanic. Dil., Ammon. Bromid., Beef Essence (Brand's), *Bisedia*, Bismuth Preps., Calcii Chlorid., Calcis Aqua, Cerium Salts, Chloral, Chloroform preps., Coca and Cocaina, Ingluvin, Liquor Sodæ Effervescens, Magnes. Carb. Liq., Morphinæ inj. hypod., Nitroglycerin, Nux Vomica, Potass. Bicarb. cum Acid. Citric. Mist. Efferves.,

Sedeff, Sodii Phosph. Effervescens., *Stovaine*, Vin. Ipecacuanhæ in minim doses, Normal Saline per rectum.—B.M.J. i./05,1350. Of infancy, Sodium Bicarbonate; of Pregnancy, see Pregnancy.

Warts and Corns.—*Acid. Acetic Glaciale, Acid Carbolic., Acid. Chromic., Acid Nit., Acid Picric, Acid. Trichloracetic. Anacardium, Collodium Callosum, Collodium Salicylicum, Collodium Salicylicum c. Acid. Lactic, Formalin, Hydrarg. Nitras, Iodi Linim., Papayotin, Paraform Collodion, Potassæ Liquor, Liquor Sodii Ethylatis, Thuja.*

Water, Purification. — *See* Antithyroid Tablets, *Copper*, Iodine, Permanganates, *Potassium Iodate.* Silver Fluoride, *Sodium Persulphate.*

Whites.—See Leucorrhœa.

Whooping-Cough. — Acid. Benzoic. and Benzoates, Acid. Carbolic, Acid. Hydrocyanic Dil., Alumen, Amyl Nitris, Anemonin, Antipyrine, Antispasmin, Antitussin, Apomorphinæ Hydrochlorid. (minute doses), Aristochin, Atropine, Auri et Sodii Chlor., Belladonna, Benzol. Bromides, Bromoform, Bryonia, Calcis Aqua, Camphor. Elixir, Camphora Monobrom., Cannabis, Chloral, Codeine Jelly, Conium, Ergot, *Fluoroform*, Gelsemium, Glycaphorm, Grindelia, *Koumiss*, Lobelia, Morphine preps, *Ol. Succini*, Ozonic Ether, Phenacetin, Phenazonum, Quinine, Rubidium-Ammonium Bromide, Senega, Sodii Benzoas, Stramonium, Syrup cum Narceina, Zinci Oxid. and Sulphas.

Inhalation of Acid. Fluoric., Formalin or Naphthalene, or Pyridine, Carbon Dioxide per rectum, Himrod's Cure, Hyoscyamus, Succini Ol. as Liniment, Vapor Coninæ. Fumigate room with Sulphurous Acid, Resorcin as Nebula.

Worms (Intestinal):—

Ascarides (Threadworms).—Enemas of Vinegar or of Aloes, Sodium Chloride, Salicylic Acid, Thymol or Quassia.

Lumbrici (Round Worms).—Anacardium, Areca, Cambogia, Calomel, Jalap, Naphthalene, Santonin, *Santoninoxim*, Scammony, *Spigelia*, Turpentine, *Chenopodium, Azedarach.*

Tænia (Tapeworm).—Areca, Cousso, Filix Mas, Kamalal Mucuna, Pelletierine, Calomel, *Pepo*, Thymol, *Embelia Ribes*, Terebene, *Filicic Acid.*

Wounds.—See Antiseptics. Surgical specialties are—*Glass Splints, Animal Membrane*, Silver Leaf, Silver Plates Soluble Glass, Collodions, *Celloidin Solution.*

Zoster.—See Herpes.

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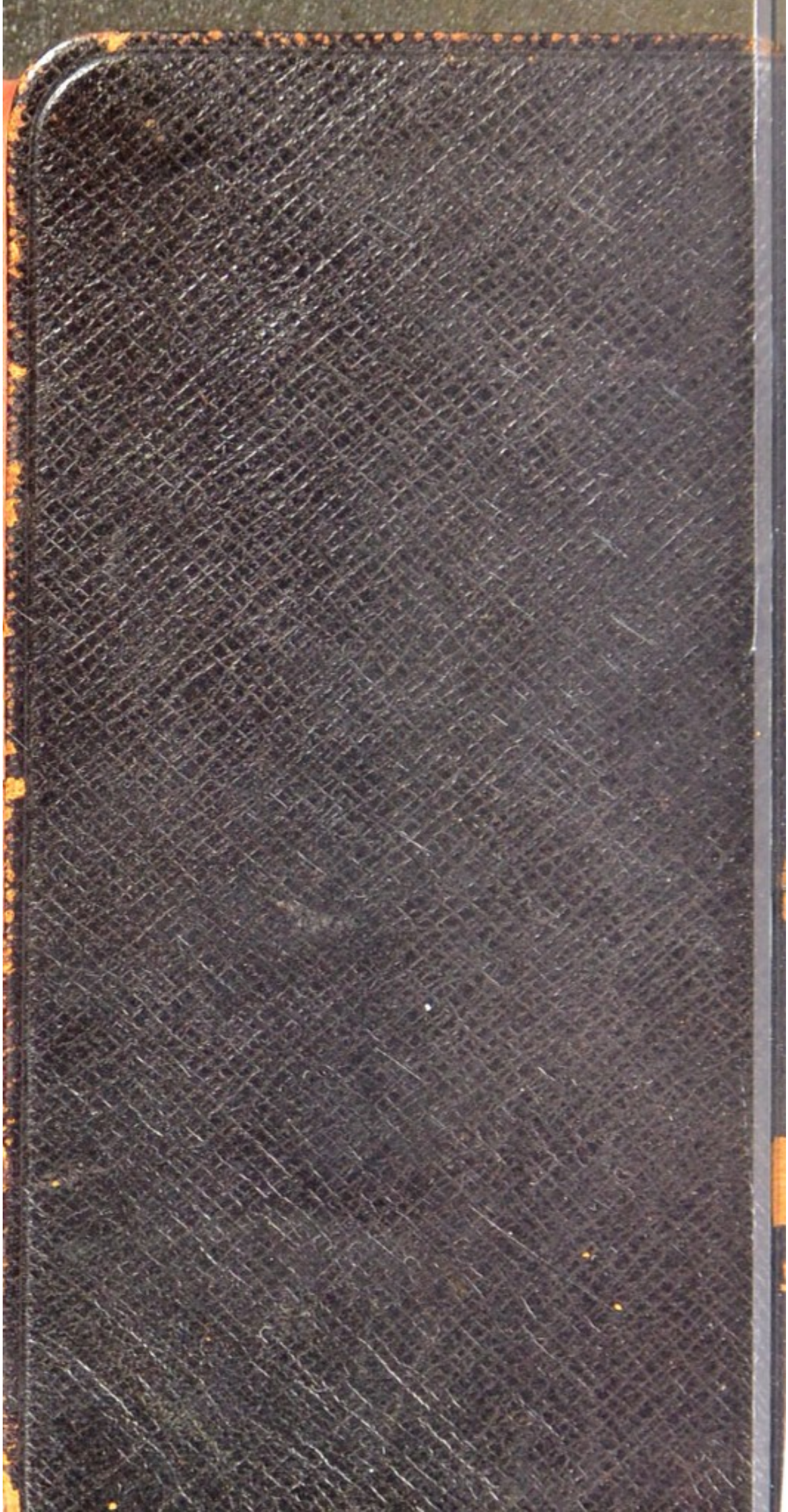

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