Medicines, their uses and mode of administration : including a complete conspectus of the three British pharmacopoeias, an account of all the new remedies, and an appendix of formulae / by J. Moore Neligan ; with notes and additions, conforming it to the pharmacopoeia of the United States, and including all that is new or important in recent improvements by David Meredith Reese.

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MEDICINES,

THEIR USES

AND

MODE OF ADMINISTRATION;

INCLUDING

A COMPLETE CONSPECTUS OF THE THREE BRITISH PHARMACOPŒIAS,

AN ACCOUNT OF ALL THE NEW REMEDIES,

AND

AN APPENDIX OF FORMULÆ.

BY

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WITH NOTES AND ADDITIONS, CONFORMING IT TO THE PHARMACOPŒIA OF THE UNITED STATES, AND INCLUDING ALL THAT IS NEW OR IMPORTANT IN RECENT IMPROVEMENTS

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PREFACE

OF THE AMERICAN EDITOR.

In introducing the present work to the profession in America, the editor feels great confidence in the favourable reception it will receive, in view of its intrinsic merits, so soon as it can be examined by those competent to estimate its practical value. He regards it as condensing within small compass an amount of information, upon the several departments upon which it treats, surpassing in kind and extent that found in any other volume in the English language. For though the Conspectus of Dr. Thompson, lately republished here, is an approach to a somewhat similar plan, yet the present work is so much more ample in its scope, and exhibits so extensive a range of topics of a critical and practical character, that it would seem to be occupying a field of professional research hitherto unexplored.

As a "book of reference for the practitioner, and an outline of Materia Medica for the student," it is presented to the public by the author with an unpretending title, in reliance that his labours will be appreciated by his professional brethren, without the adventitious favour which an imposing name is wont to bespeak. And yet this single volume will be found to compress within its pages, not merely "medicines, their uses and modes of administration," but a compendium of *Chemistry*, *Pharmacy*, *Toxicology*, *Pathology*, and *Therapeutics*, so far as these several departments are connected with the details of Materia Medica; and an elucidation of the nature, physical and chemical properties, modes of preparation and administration, and methods of adaptation to morbid conditions of function or structure, of every individual agent employed in the art of healing. And so skilfully is this process of condensation elaborated to our hands, that at a single glance, and, for the most part, within the compass of a page, all these several aspects of the

individual articles of the Materia Medica may be summarily examined.

But, while this just meed of praise is frankly bestowed upon the scientific labours of the learned author, the editor has not scrupled to criticise, with the freedom characteristic of our fraternity, not only the classification of the work, and its innovations upon our burdened nomenclature, but many of the author's theoretical, and a few of his practical observations, to which exception is taken for the reasons found in the accompanying notes, which, in every instance, are designated by brackets [ ], and which, for the convenience of the student, are inserted *in loco*, instead of being placed at the foot of the page, or in an appendix.

The nomenclature and pharmaceutics of the volume have been conformed to the Pharmacopœia of the United States, that great national work being everywhere recognised in this country, and approved by our universities and medical colleges, as entitled to be ranked with the similar publications of London, Dublin, and Edinburgh, the three British authorities cited in the text.

So, also, a number of new remedies, and many officinal preparations, both old and new, omitted by the author, have been supplied by the editor, availing himself of details furnished by two of his friends belonging to the New-York College of Pharmacy, Messrs. Milhau and Dupuy, to whom he acknowledges his obligations.

In the hope that the reprint of this valuable compend of Professor Neligan will be regarded as worthy the patronage of the profession and the public, and that the improvements attempted may contribute to the promotion of medical literature, the undersigned bespeaks for both the candid examination of medical teachers, practitioners, and students.

D. M. Reese.

PREFACE.

The object of the author in the following pages has been to furnish a concise view, but as complete as possible, of the different substances, both simple and compound, which are deemed worthy of a place in the Materia Medica. While, therefore, sufficient attention has been bestowed on the different articles contained in the three British Pharmacopœias, an account is also given of those remedies of more recent introduction, which, although not officinal, are important agents in the treatment of disease.

The difficulty, in the present state of our knowledge, of accurately classifying medicines with reference to their therapeutical properties, has deterred many recent writers from adopting a physiological classification of the Materia Medica; but the great practical value of an arrangement which is based on the ultimate medicinal effects of remediate agents, has induced the author to adopt such a classification, in preference to either a natural-historical or alphabetical arrangement. In order, however, to afford a facility of reference, the chapters themselves, and the individual articles described in each chapter, are arranged in alphabetical order.

Although the author fully admits the interest attached to the study, and the advantage derived from a knowledge of the natural and chemical history of medicines, he has, nevertheless, thought that they might, not only with propriety, but with benefit, be omitted from a work of this character, which is intended as one of reference for the practitioner, and as an outline of Materia Medica for the student.

In describing each medicinal substance, the following plan is adopted:

1st. The officinal appellation and English name of each article is given; and, in the case of a vegetable substance, the native country and Botanical Classification of the plant from which it is obtained. For the advantage of the student, the most important characters of each medicinal plant are also concisely described.

2d. The Physical properties.

3d. The Chemical properties.

4th. The mode of preparation. Under this head the processes of the three British Pharmacopœias are given in full.

5th. The adulterations, and the manner in which they may be detected.

6th. The therapeutical effects, and the uses of the substance in the treatment of disease.

7th. The dose and mode of administration. Under this head all the officinal preparations of the British Pharmacopœias, as well as many of those ordered by the Continental and American colleges, are introduced.

8th. The incompatibles.

9th. In the case of poisons, the antidotes and mode of treatment.

The author has added an Appendix of Formulæ, which are principally confined to the new remedies described in the work, and also an extended Posological Table.

Leeson-street, Stephen's Green, Dublin.

TABLE OF THE ABBREVIATIONS EMPLOYED.

B. C.	Botanical Characters.
P. U. & M. of Prep. .	Part Used and Mode of Preparation.
P. P.	Physical Properties.
C. P.	Chemical Properties.
Prep.	Preparation.
Th. E.	Therapeutical Effects.
D. & M. of Adm. . .	Dose and Mode of Administration.
Pharm. Prep. . . .	Pharmaceutical Preparations.
Incomp.	Incompatibles.

PRELIMINARY OBSERVATIONS

BY THE

AMERICAN EDITOR.

The following table of contents, which the author has prefixed to his volume, exhibits a classification of the Materia Medica professedly "based on the ultimate medicinal effects of remediate agents." This is intended as an approximation to the *Physiological* classification, which all concur in regarding as desirable, and, indeed, necessary, in order to conform this department to the systematic arrangements so happily introduced into the other branches of medical science. The imperfection of our knowledge in respect to the laws of vitality, and the phenomena resulting from morbid and curative agencies, as applied to the living organization, does, indeed, present a formidable obstacle to such an arrangement of the multiplied articles of the Materia Medica as shall be unexceptionable, or which, in point of accuracy, shall be entitled to entire confidence. And, moreover, the improvements which are annually introduced in this department forbid the expectation that any classification can be made, in the present state of the science, which will not need to be modified, in order to keep pace with the march of discovery and improvement characteristic of the age. Still, however, there are certain great outlines, which may be seized upon, as having enough of fixity and permanence to furnish the basis of a systematized arrangement less faulty than any yet adopted.

Dr. Neligan has here arranged the whole Materia Medica into 22 divisions or chapters, alphabetically entitled as follows, viz.:

Antacids,
Anthelmintics,
Antispasmodics,
Astringents,
Cathartics,
Caustics,
Diaphoretics,
Diuretics,
Emetics,
Emmenagogues,
Emollients,
Epispastics,
Errhines,
Expectorants,
Narcotics,
Refrigerants,
Sedatives or Contra-stimulants,
Sialagogues,
General Stimulants,
Special Stimulants,
Tonics, and
Supplementary agents.

It may deferentially be objected to this classification, that it is inaccurate, hypercritical, and incomplete; and that while it innovates by proposing new technical distinctions, it does so still more exceptionably, by rejecting one or more significant and well-established terms, and substituting others of ambiguous and equivocal meaning. Besides, its last extended class or chapter of "supplementary agents," for which he found it impossible to provide a place in any one of his divisions, presents an insuperable objection to his classification.

For the most accurate, philosophical, and complete arrangement of the Materia Medica which has ever been published, the student is referred to the late publication on the subject by Professor Paine, of the New-York University, a brief analysis of which can only be presented here.

He divides the Materia Medica into eleven classes, viz.: 1. Antiphlogistics; 2. Permanent tonics; 3. Diffusible stimulants; 4. Cerebro-spinants or nervous agents; 5. Astringents; 6. Uterine agents; 7. Urinary agents; 8. Anthelmintics; 9. Errhines; 10. Chemical agents; 11. Diet and regimen, in a general sense.

The obvious merit of this arrangement consists in the fact of its entire completeness, embracing every remedial and auxiliary agent included either in the Materia Medica or Materia Alimentaria, all of which may be comprised under one or the other of these classes, without the unsightly appendage of a long list of "supplementary agents."

The first *class*, Antiphlogistics, he divides into nine *orders*, viz., Bloodletting, Cathartics, Emetics, Alteratives, Expectorants, Direct sedatives, Diuretics, Cutaneous and other local applications, Low diet, and Rest. And these, again, he divides and subdivides as they severally admit of such division. The group of *sialagogues*, including all the mercurials, &c., and *sudorifics*, comprising all the antimonials, &c., he places among the *General Alteratives;* while he assigns to the division of Limited Alteratives, Iodine, Bromine, Gold, Silver, Iron, Zinc, Mercury, &c., with their preparations, as also Strychnine, Veratria, Cicuta, Colchicum, Cod's liver oil, Sarsaparilla, &c., &c., together with all those agents, whether animal, vegetable, or mineral, which are included under the six subdivisions, as follows, viz.:

1. Adapted to scrofulous, and some other specific inflammations.
2. Adapted to syphilis, and certain other chronic inflammations.
3. Adapted to scrofula complicated with syphilis.
4. Adapted to rheumatic inflammation and gout.

5. Adapted to intermittent fevers and intermittent inflammations.
6. Adapted to obstinate and chronic cutaneous diseases, &c.

Under the head of "cutaneous and other local applications," and order of Antiphlogistics, he includes, as subdivisions, *Epispastics*, *Caustics*, *Emollients*, &c.; while *Narcotics*, *Antispasmodics*, &c., are comprised in his class of "Cerebro-spinants or Nervous agents;" and in the class of "Chemical agents" he places all the *Antacids*.

But without entering into farther details, for which reference must be had to the work of Professor Paine itself, enough is here exhibited to show its superiority over the arrangement of Professor Neligan. Attention is particularly invited to the fact that, in this work, the author has rejected the designation *Alteratives*, and in his classification substitutes the term "Special Stimulants." It will be seen by the other arrangement referred to, that a very large class of remedial agents are grouped among the Alteratives, and Professor Paine defines this term as including "all remedies which actually produce an influence upon disease;" and he cites the high authority of Pereira, who teaches that "this class includes nearly the whole of the articles comprising our Materia Medica." The substitute for the title of this class, as well as the rejection of the term alteratives, will be found animadverted upon in its proper place. The student is advised to estimate the merits of the two classifications by comparing them for himself.

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MEDICINES:

THEIR USES

AND

MODE OF ADMINISTRATION.

MEDICINES,

THEIR USES

AND

MODE OF ADMINISTRATION.

CHAPTER I.

ANTACIDS.

(Alkalines—Antilithics—Lithontriptics.)

Antacids are medicines which correct acidity of the stomach and digestive organs, by combining chemically with the free acid existing there, and neutralizing it. Their action is manifestly only temporary and palliative, as they do not correct that peculiar state of the digestive organs which favours the formation of acid; and their continued use produces a precisely similar disease of the alimentary canal. Antacids should, therefore, be prescribed in combination with the *vegetable tonics*, and in no case should their administration be long persisted n without occasional interruptions. One or two circumstances relating to the particular remedy of this class which should be employed, require to be noticed. Where the acid exists in the stomach in the gaseous state, ammonia and its carbonate should be preferred, as, in consequence of their volatility, a gaseous acid, which would elude the action of the fixed alkalies, will be neutralized by them. If the acidity be present in the lower bowels, as in the cœcum or colon, magnesia or lime should be preferred, as being less likely to be neutralized or absorbed before they reach that portion of the intestinal canal than the other antacids. Where the acid exists in the urinary organs, the alkalies will be found best adapted, as they have a tendency to act more directly on the kidneys; and where it is *lithic acid* that predominates in the urine, the preparations of potash should be preferred to those of soda, as the salt formed by the combination of the former with the acid in question is much more soluble than that formed with the latter.

[The suggestion here made, touching the danger of the long-continued use of antacids, is of great practical importance, for organic dyspepsia has often resulted from the incautious frequency of their employment, the tone of the stomach being permanently destroyed. The alkalies and alkaline earths, when used as ant-

acids, are strictly chemical remedies, and, when taken beyond the extent necessary to correct free acid, become irritants to the nerves of the stomach, and prove a source of numerous morbid mischiefs. The direction to combine them with vegetable tonics, while it mitigates the evil by taking the antidote and poison together, will fail to remove it. A much better practice for removing acidity is to rely upon antacids only as a palliative and temporary remedy, and employ suitable medication and regimen, especially the latter, for removing the cause upon which the generation of acid in the stomach depends. In a majority of cases, it will be found that functional indigestion or incipient dyspepsia is the source of acidity when its presence in the stomach becomes afflictive. The food, or any portion of it, remaining in the stomach undigested, becomes subject to chemical laws, and undergoes fermentation or putrefaction before passing the pylorus, and the generation of acids and gases is the result, which present us with the phenomena of flatulence and acidity, which usually coexist. In infant children, the improper quantity and quality of the food which is so often indiscreetly given is the source of the symptoms for which antacids are prescribed. In these, as well as in adults, therefore, proper abstinence and attention to regimen will soon correct the evil without medication, if treated early; but where the mischief has subsisted so long that the tone of the stomach is impaired, either by the disease or the treatment, the vegetable tonics may be resorted to, or any other agencies adapted to restore or improve the digestive function.]

Ammoniæ causticæ aqua, D. Ammoniæ liquor, L. Ammoniæ aqua, E. *Water of caustic Ammonia; Aqueous solution of Ammonia.*

P. P.—A colourless limpid fluid, with a pungent ammoniacal odour and a very acrid alkaline taste. The sp. gr. varies with the strength of the preparation; that of Dublin is directed to be ·950, that of London and Edinburgh ·960.

C. P.—A solution of gaseous ammonia in water. Ammonia is composed of N. H^3., or of 1 eq. of *amidogene* and 1 of hydrogen (Kane). At 32° F. water may be made to absorb 780 times its volume of the gas; the solution of the Dub. Phar. contains 10·5 per cent., that of Lond. and Edin. 8·3. per cent. of ammonia. It neutralizes acids, with which it forms salts; gives a brown colour to litmus paper, which is only temporary; and forms dense white fumes with the vapour of muriatic acid. Exposed to the air, in consequence of the volatility of the gas, part of it rapidly escapes, while the remainder, absorbing carbonic acid, is converted into carbonate of ammonia, which remains in solution. Cooled down to —40°, a strong solution freezes into long, silky needles; and at 50° it boils; the weak solution of the pharmacopœias boils at about 150°.

Prep.—*Dub.* "Muriate of ammonia, in powder, 3 parts; recently-burned lime, 2 parts; water, 10 parts; sprinkle one part of hot water on the quick-lime, put into

an earthen vessel, and cover it; dissolve the salt in the remainder of the hot water; put the lime, when it has fallen into powder and become cool, into a retort, and add the saline liquor, when cold, to it; with a medium heat, distil five parts into a refrigerated receiver." *Lond.* "Hydro-chlorate of ammonia, ℥x.; lime, ℥viij.; water, Oij.; put the lime slacked with water into a retort, then add the salt, broken into small pieces, and the remainder of the water; let f℥xv. distil." *Edin.* "Sal-ammoniac, ℥xiij.; quick-lime, ℥xiij.; water, f℥viiss.; distilled water, f℥xij.; slack the lime with the water; cover it up till it cools; triturate it well and quickly, with the sal-ammoniac previously in fine powder; and put the mixture into a glass retort, to which is fitted a receiver with a safety tube, and containing f℥iv. of the distilled water, but capable of holding twice as much. Connect with the receiver a bottle, also provided with a safety tube, and containing f℥iv. of the distilled water, but capable of holding twice as much. Connect this bottle with another loosely corked, and containing the remaining f℥viij. of the distilled water. The communicating tubes must descend to the bottom of the bottles at the farther end from the retort; and the bottles and receiver must be kept cool by snow, ice, or a running stream of very cold water. Apply to the retort a gradually-increasing heat till gas ceases to be evolved; remove the retort, cork up the aperture in the receiver where it was connected with the retort, and apply to the receiver a gentle and gradually-increasing heat, to drive over as much of the gas in the fluid contained in it, but as little of the water as possible. Should the liquid in the last bottle not have a density of 960, reduce it with some of the strong ammonia in the first bottle, or raise it with distilled water, so as to form aqua ammoniæ of the prescribed density. The strong aqua ammoniæ in the first bottle may be reduced, to form the weaker solution, by diluting it with two parts and a half of water."

Adulterations.—Solution of ammonia often contains carbonate of ammonia, which is known by its effervescing with acids; or muriate of ammonia, which is detected by solution of nitrate of silver causing a white precipitate with it, nitric acid having been previously added to saturation. That it is of the proper strength is indicated by its being of the prescribed density.

Th. E.—Ammonia acts as a direct antacid, by its neutralizing powers; it also stimulates powerfully the digestive organs. It is, therefore, to be preferred to the other remedies of this class, in cases where we wish to combine the effects of a stimulant and antacid, as in cardialgia, and flatulence arising from acidity of the stomach; but if there be any tendency to inflammation present, it should not be employed. As an antidote in poisoning with the mineral acids, it is not so valuable as the other alkalies; but in cases of poisoning with prussic acid, oil of bitter almonds, &c., it is only inferior to chlorine.

D. & M. of Adm.—Min. x. to min. xxx. in an ounce of water, sirup, or any bland liquid.

Incomp.—All acids; and the earthy and metallic salts, except those of potash, soda, lime, and baryta.

Ammoniæ bicarbonas, D. *Bicarbonate of Ammonia.*

P. P.—Large crystals of the right rhombic prism series, with a weak ammoniacal odour, and a saline taste.

C. P.—It is composed of 1 eq. of ammonia, 2 of carbonic acid, and 2 of water; or of 1 eq. of *amidogene*, 1 of hydrogen, 2 of carbonic acid, and 2 of water (Kane). It is permanent in the air; exposed to a strong heat, it evaporates, leaving no residue if pure; it is soluble in eight parts of water at 60°; boiling water decomposes it, driving off part of its carbonic acid and ammonia. The solution in cold water is faintly alkaline.

Prep.—*Dub.* "In a proper apparatus, expose any quantity of *water of carbonate of ammonia*, until the alkali is saturated, to the stream of carbonic acid gas, which escapes during the solution of white marble in dilute muriatic acid; then set it aside that crystals may be formed, which are to be dried without heat, and kept in close vessels."

Th. E.—This salt, though scarcely ever used in the present day, is an excellent antacid; it is free from the stimulating properties of ammonia or its carbonate, and also is more agreeable to the taste.

D. & M. of Adm.—Gr. v. to gr. xxv. It may be given in *cold* aqueous vehicles, or in any of the bitter infusions.

Incomp.—Same as for aqua ammoniæ.

Ammoniæ carbonas, D. E. Ammoniæ sesquicarbonas, L. *Carbonate of Ammonia; Sesquicarbonate of Ammonia.*

P. P.—A solid white salt, in semitransparent fibrous cakes or fragments; with a pungent ammoniacal odour, and a caustic alkaline taste. Sp. gr. ·966.

C. P.—It consists of 3 eq. of carbonic acid, 2 of ammonia, and 2 of water; or of 1 eq. of the bicarbonate, and 1 of a simple carbonate which consists of 1 of amidogene, 1 of hydrogen, and 1 of carbonic acid (Kane). Exposed to the air, it effloresces, and soon falls to powder: carbonate of ammonia is evolved, and the remaining powder is the bicarbonate. It is sublimed by heat, without any residuum if it be pure. It is soluble in four parts of water at 60°, but is decomposed by boiling water, and by alcohol; the solution is highly alkaline, but turmeric paper, which has been rendered brown by it, recovers its yellow colour on exposure to the air.

Prep.—*Dub.* "Muriate of ammonia, powdered and well dried; and dried carbonate of soda, of each, one part; mix, and put them into an earthen-ware retort: and sublime the carbonate of ammonia with a gradually-increasing heat into a receiver kept cool." *Lond., Edin.* "Hydrochlorate of ammonia (sal-ammoniac, E.), ℔j.; chalk, ℔jss.; reduce them separately to fine powder; mix, and (in a retort with a proper receiver, E.) sublime with a gradually-increasing heat."

Adulterations.—If this salt contain any fixed or insoluble impurity, it will not be entirely sublimed by heat, nor completely soluble in water. Sometimes, owing to bad preparation, it contains muriate or sulphate of ammonia; their presence is detected, the former by nitrate of silver, the latter by muriate or nitrate of baryta, causing a white precipitate in a solution of the salt, nitric acid having been previously added to saturation.

Th. E.—As an antacid, it may be employed in the same forms of dyspepsy as the solution of ammonia; but where flatulence is present, the use of the carbonate is objectionable. Carbonate of ammonia is also administered with much advantage in the lithic acid diathesis; and in diabetes it has been employed with much success by Dr. Barlow, of London.—(*Guy's Hosp. Rep.*, vol. v., p. 287.)

D. & M. of Adm.—Gr. v. to gr. xx. in pill, or in any *cold* aqueous vehicle. Gr. xxx. produces vomiting.—*Ammoniæ carbonatis aqua*, D. E. *Liquor ammoniæ sesquicarbonatis*, L. (Dissolve ʒiv. of carbonate (sesquicarbonate, L.) of ammonia in 15 parts (Oj., L. E.) of distilled water, and strain. "The density of this solution is 1090,"

Dub.) A convenient strength for medicinal purposes; dose, min. xxx. to min. lx., properly diluted.

Incomp.—Acids; calcareous salts; and the salts of iron, zinc, lead, and mercury; but sulphate of magnesia is not incompatible with carbonate of ammonia.

Calcis aqua, D. E. Calcis liquor, L. *Lime-water.*

P. P.—A transparent, colourless liquid; odourless, but having a disagreeable alkaline taste.

C. P.—Lime is only sparingly soluble in water; requiring 778 parts at 60° and 1270 parts of boiling water; being, therefore, more soluble in cold than in hot water, so that a saturated solution, when boiled, deposites a hydrate of lime. Exposed to the air, lime-water absorbs carbonic acid, and becomes covered with a thin crust of carbonate of lime. It acts faintly alkaline on vegetable colours; gives white precipitates with carbonic and oxalic acids, but does not precipitate with sulphuric acid.

Prep.—*Dub.* "Fresh burned lime, and boiling water, of each one part; sprinkle the water on the lime, in an earthen vessel, covered while the lime grows hot and falls to powder; then pour over it 30 parts of cold water; cover the vessel again, and agitate the mixture repeatedly for 24 hours; then, as soon as the lime has subsided, pour off the clear liquor, and keep it in well-stopped bottles." *Lond.* "Lime, ℔ss.; distilled water, Oxij.; upon the lime first slacked with a little of the water pour the remainder of the water, and shake them together; then immediately cover the vessel and set it by for three hours; afterward keep the solution with the remaining lime in stopped glass vessels; and when it is to be used, take from the clear solution." *Edin.* "Take any convenient quantity of water; pour a little of it over about a twentieth of its weight of lime; when the lime is slacked, add it to the rest of the water in a bottle; agitate well; allow the undissolved matter to subside; pour off the clear liquor when it is wanted, replacing it with more water, and agitating briskly as before."

Th. E.—Lime-water is a useful antacid in those forms of dyspepsy characterized by great irritability of the stomach, accompanied with constant secretion of acid. In America, a diet almost exclusively of lime-water and milk, in the proportion of one part of the former to two or three of the latter, is found to be a very effectual plan of treatment in dyspepsia accompanied with vomiting of food. In the acidity of stomach of the gouty and rheumatic diathesis, the alkaline antacids should be preferred to lime.

D. & M. of Adm.—f℥i. to f℥iv. It is most conveniently administered in milk, which conceals its disagreeable taste; but as this would be an injurious addition in many cases, it may be given alone. When lime-water has been administered for some time, its use should be occasionally discontinued.

Incomp.—The vegetable and mineral acids, tartar emetic, and most vegetable infusions and decoctions, as of calumba, cinchona bark, gentian, senna, rhubarb, sarsaparilla, &c.

Creta præparata, D. L. E. [and U. S. P.]. Calcis carbonas præcipitatum, D. *Prepared chalk; prepared carbonate of lime.*

P. P.—Prepared chalk is usually in small conical masses, of a dull, grayish white colour, opaque, and very friable; the powder is

soft and massive. It is odourless and tasteless, but adherent to the tongue. Sp. gr. about 2·3. Precipitated carbonate of lime is a snow-white, fine powder.

C. P.—It is composed of one eq. of carbonic acid, and one of lime. It is permanent in the air; exposed to a red heat, it parts with its acid, and is converted into quicklime. It is miscible with, but is not soluble in water; it dissolves in small quantity in water containing carbonic acid, from which, however, it is deposited on exposure to the air.

Prep.—*Creta præparata*, D. L. E. "Chalk, any quantity (℔ss. L.); add a little water to the chalk, and rub it to powder; put it into a large vessel with a sufficiency of water, and mix with frequent agitation; let it rest for a short time (until the coarser particles subside, D.), and pour off the supernatant liquor (still turbid, L. E.); (repeat the process, E.; frequently, D.): finally, collect on a filter the fine powder that has subsided from the poured-off liquor, and dry it for use (on a bibulous stone or on paper, D.)." "Oyster shells, first freed from impurities, and washed with boiling water, are prepared in the same manner," L.—*Calcis carbonas præcipitatum*, D. "Take of the water of muriate of lime, five parts; add three parts of carbonate of soda dissolved in four times its weight of distilled water; wash the precipitate thrice with water by subsidence and effusion; finally, collect it, and dry it on a chalk stone or on paper."

Adulterations.—Prepared chalk generally contains silica and alumina, and, from not having been sufficiently dried, moisture; those impurities are best detected by the tests of the *Edin. Pharm.*, which indicate the exact amount of pure carbonate of lime present: "A solution of gr. xxv. in ʒx. of pyroligneous acid, when neutralized by carbonate of soda, and precipitated by gr. xxxij. of oxalate of ammonia, continues precipitable after filtration by more of the test."

Th. E.—Chalk is employed with much benefit as an antacid in acidity of the stomach, especially when accompanied with diarrhœa, so frequently the case in infancy and childhood; for this purpose, it is advantageously combined with aromatics, or with opium. It is also employed as an antidote in poisoning with nitric, muriatic, or oxalic acids. Precipitated carbonate of lime is not employed in medicine, as it possesses no advantage over prepared chalk, and is much more expensive. It is used as an ingredient in tooth powders, and for the preparation of *mercury with chalk*.

D. & M. of Adm.—Gr. x. to ʒij. in powder or in mixture.—*Mistura cretæ*, D. L. E. ("Prepared chalk, ℥ss.; pure sugar, ʒiij.; mucilage of gum-arabic, ℥i.; water, *by measure*, ℔j.; mix;" D. "Prepared chalk, ℥ss.; sugar, ʒiij.; mixture of acacia, f℥iss.; cinnamon-water, f℥xviij.; mix;" L. "Prepared chalk, ʒx.; pure sugar, ʒv.; mucilage, f℥iij.; spirit of cinnamon, f℥ij.; water, Oij.; triturate the chalk, sugar, and mucilage together, and then add gradually the water and spirit of cinnamon," E.) Chiefly used in diarrhœa as a vehicle for more active medicines. Dose, f℥i. to f℥ij. *Pulvis cretæ comp.*, D. L. E. ("Prepared chalk, ℔ss.; cinnamon, ℥iv.; tormentil root, and gum-arabic, of each, ℥iij.; long pepper, ℥ss.; rub them separately to fine powder, and then mix them," D. L. "Prepared chalk, ℥iv.; cinnamon, in fine powder, ʒiss.; nutmeg, in fine powder, ʒi.; triturate them well together," E.) Ant-

acid and aromatic, principally employed in diseases of children; dose, gr. x. to gr. xxx. *Trochiscus cretæ*, E.—(Prepared chalk, ʒiv.; gum-arabic, ʒi.; nutmeg, ʒi.; pure sugar, ʒvi.; reduce them to powder, and beat them with a little water into a proper mass for making lozenges.) Antacid and aromatic, used in acidity of the stomach; dose, ʒi. to ʒij.

Incomp.—Acids, and acidulous salts.

Magnesia, D. L. E. *Magnesia; Calcined Magnesia.*

P. P.—A very light, soft powder, perfectly white, odourless and tasteless, slightly adherent to the tongue. Sp. gr. about 2·3.

C. P.—It consists of one eq. of magnesium, and one of oxygen. Exposed to the air, it absorbs carbonic acid and moisture: it is highly infusible. It is very slightly soluble in water, requiring 5142 times its weight of water at 60° for its solution; and, like lime, it is more soluble in cold than in hot water. It acts feebly alkaline on vegetable colours.

Prep.—"Expose any convenient quantity of carbonate of magnesia in a crucible to a full red heat for two hours (or till the powder, when suspended in water, presents no effervescence on the addition of muriatic acid, E.), and preserve it, when cold, in well-stopped glass bottles," D. E. "Carbonate of magnesia, ʒiv.; burn it for two hours in a very strong fire," L.

Adulterations.—Magnesia generally contains some carbonate, either from faulty preparation or bad keeping; its presence is indicated by its causing effervescence with dilute mineral acids. It is frequently adulterated with lime, silica, and alumina. If it contain silica, it will not dissolve completely in dilute muriatic acid; if alumina be present, the solution in dilute muriatic acid precipitates with excess of ammonia; and if lime be present, solution of oxalate of ammonia, or of the bicarbonate of potash, gives a white precipitate with the solution in the dilute acid.

Th. E.—As an antacid, magnesia is employed in dyspepsia attended with acidity of the stomach; in such cases it is generally preferred to the alkalies, as being less irritant, and as the combinations which it forms with the free acids of the stomach are gently laxative. In gastrodynia and heartburn, given in combination with some aromatic, a short time before the meals, it seldom fails to prove beneficial. It is also administered with much advantage in the acidity attendant on infantile diseases, and in persons of a gouty and rheumatic diathesis. Magnesia is also used as an antidote in poisoning with the mineral acids.

D. & M. of Adm.—Gr. x. to gr. xv., twice or three times daily. It may be given suspended in milk, or in some aromatic water.

Incomp.—Acids; acidulous salts; metallic salts; and muriate of ammonia.

Magnesiæ carbonas, D. L. E. *Carbonate of Magnesia.*

P. P.—A very white powder, light and bulky; inodorous and tasteless, varying in density, two sorts being commonly met with; the one very light, and either in very fine powder or in small cubical cakes (*light magnesia*); the other dense, and somewhat granular (*heavy magnesia*).

C. P.—According to Berzelius, it is a compound of hydrate of magnesia with hydrated carbonate of magnesia, consisting of 3 eq. of carbonic acid, 4 eq. of magnesia, and 4 eq. of water. It is permanent in the air; exposed to a red heat, it parts with its water and carbonic acid, magnesia being left. It is very sparingly soluble in water, requiring 2493 parts of cold, and 9000 of hot water for its solution. But water charged with carbonic acid gas dissolves it, in the proportion of 13½ grains to the ounce. It acts, on vegetable colours, feebly alkaline.

Adulterations.—They are similar to those of calcined magnesia, and may be detected by the same tests.

Th. E.—Carbonate of magnesia is employed as an antacid in the same cases as magnesia; but, owing to the carbonic acid which is disengaged in the stomach when it meets with the acids naturally present in that viscus, it is objectionable in many cases.

D. & M. of Adm.—Gr. xv. to ʒss.; it may be administered suspended in milk, or in some aromatic water. The most convenient form, however, for the exhibition of the carbonate of magnesia, is the solution in carbonated water, which was first introduced to the notice of the profession by Sir James Murray of Dublin. It is prepared by exposing distilled water, in which very pure carbonate of magnesia is suspended (in the proportion of 13½ grains of the latter to every fluid ounce of the former), to a stream of carbonic acid gas forced into it by means of steam power, until a complete solution is formed. It then constitutes *Aqua magnesiæ bicarbonatis*, and is given as an antacid in doses of fʒss to fʒiss. *Trochisci magnesiæ*, E. (Carbonate of magnesia, ʒvi.; pure sugar, ʒiij.; nutmeg, ℈i.; beat them in powder, with mucilage of tragacanth, to a mass, for lozenges.) In acidity of the stomach, *ad libitum*.

Incomp.—Acids; acidulous and metallic salts; muriate of ammonia; and lime-water.

Potassæ causticæ aqua, D. Liquor potassæ, L. Potassæ aqua, E. *Water of caustic potash; Solution of potash.*

P. P.—A transparent colourless liquid, with an oily appearance and a soapy feel; it is odourless, but has an intensely acrid alkaline taste. Its specific gravity is different in the three British Pharmacopœias; that of the *Dub.* preparation is 1·080, that of *Lond.* 1·063, and that of *Edin.* 1·072.

C. P.—A solution of potassa in water. Exposed to the air, it absorbs carbonic acid rapidly, and is converted into the carbonate of potash. By heat the water is driven off, but no farther change takes place. It reacts on vegetable colours powerfully alkaline. Solution of potash converts most oils and fats into soap. It does not effervesce with acids, but combines with them, forming salts.

Prep.—*Dub.* "Carbonate of potash, from potashes of commerce, and recently-burned lime, of each, two parts; water, fifteen parts; sprinkle one part of the water made hot on the lime in an earthen vessel, and as soon as it is slacked, mix with the salt, and add the remainder of the water. Put the mixture, when cool, into a well-stopped bottle, and agitate frequently for three days; as soon as the carbonate of lime has subsided, pour off the clear liquor, and preserve in carefully-stopped green-

glass bottles." *Lond.* "Carbonate of potash, ℥xv.; lime, ℥viij.; boiling distilled water, cong. j.; dissolve the carbonate of potash in half a gallon of the water; sprinkle a little of the water upon the lime in an earthen vessel, and the lime being slacked, add the rest of the water. The liquors being immediately mixed together in a close vessel, shake them frequently until they are cold; then set aside, that the carbonate of lime may subside. Lastly, keep the supernatant liquor, when poured off, in a well-stopped green-glass bottle." *Edin.* "Carbonate of potash (dry), ℥iv.; lime, recently burned, ℥ij.; water, f℥xlv.; let the lime be slacked, and converted into milk of lime with f℥vij. of the water; dissolve the carbonate in the rest of the water; boil the solution, and add the milk of lime in successive portions, about an eighth at a time, boiling briskly for a few minutes after each addition. Pour the whole into a deep, narrow glass vessel for twenty-four hours, and then withdraw with a siphon the clear liquid, which ought to amount to at least f℥xxxv., and should have a density of 1·072." As solution of potash corrodes flint glass, it is directed to be kept in green-glass bottles.

Adulterations.—Solution of potash as kept in the shops is frequently too weak; this is known by its not being of the density prescribed by the colleges. If it contain any carbonate, it will effervesce on the addition of a dilute acid. A white precipitate caused by carbonate of soda, in the solution neutralized with dilute nitric acid, indicates the presence of lime.

Th. E.—In dyspepsia, attended with acid eructations, cardialgia, and gastrodynia, solution of potash is employed with much benefit. It not only neutralizes the free acid, but also counteracts the morbid tendency of the stomach to acid secretion. Its beneficial action is especially manifested in various forms of chronic cutaneous disease, so often dependant on acidity of the digestive organs; in which cases it should be preferred to the other remedies of this class. In the acidity of the stomach of the gouty and rheumatic, and in deposites of lithic acid, or the lithates in the urine, solution of potash is also administered with much advantage.

D. & M. of Adm.—Min. x., gradually increased to min. xl.; it should be largely diluted. Fresh table beer, or veal broth, are said to conceal its nauseous taste, and, consequently, are frequently employed as vehicles for its administration. The combination with some aromatic bitter, as gentian, cascarilla, or calumba, is generally found highly beneficial.—*Brandish's alkaline solution* (best American pearlashes, ℔ij.; quicklime, recently burned, and wood ashes (from the ash), of each, ℔ij.; boiling water, cong. vj.; add first the lime, then the pearlashes, and afterward the wood ashes, to the boiling water; mix, and in twenty-four hours draw off the clear liquor, to every pint of which add oil of juniper, min. ij.). This solution has a less disagreeable taste than the officinal *aqua potassæ*, and is therefore more generally employed; it is, however, very liable to vary in strength. Dose, f3ss. to f3ij.

Incomp.—Acids; acidulous and metallic salts; and the preparations of ammonia.

Potassæ bicarbonas, D. L. E. *Bicarbonate of Potash.*

P. P.—Transparent, colourless crystals, the primary form of which is a right oblique-angled prism. It is inodorous, but has a mild alkaline taste, without any acridity.

C. P.—It is composed of one eq. of potassa, two of carbonic acid,

and one of water. It is permanent in the air; exposed to a moderate heat, part of the carbonic acid is driven off, and it is reduced to the state of carbonate. It is soluble in four parts of water at 60°, and in less than its own weight of boiling water; the solution is feebly alkaline. It is insoluble in alcohol.

Prep.—*Dub.* "Carbonate of potash, from potashes of commerce, one part; distilled water, two parts; dissolve; expose the solution, in a proper apparatus, to a stream of carbonic acid gas, produced by the solution of white marble in dilute muriatic acid; as soon as the liquor becomes turbid, filter, and again expose it to the stream of gas until the alkali is saturated; set the solution aside in a cool place till crystals form, which are to be dried without heat, and kept in well-closed bottles." *Lond.* "Carbonate of potash, lbvi.; distilled water, cong. j.; dissolve the carbonate of potash in the water; afterward pass carbonic acid through the solution to saturation; apply a gentle heat, so that whatever crystals are formed may be again dissolved. Then set aside, that crystals may be again produced; and the liquor being poured off, dry them. Carbonic acid is obtained from chalk, rubbed to powder, and mixed with water to the consistence of a sirup, upon which sulphuric acid diluted with an equal weight of water is then poured." *Edin.* "Carbonate of potash, ℥vj.; carbonate of ammonia, ℥iiiss.; triturate the carbonate of ammonia to fine powder; mix with it the carbonate of potash; triturate them thoroughly together, adding by degrees a very little water, till a smooth and uniform pulp be formed. Dry this gradually at a temperature not exceeding 140°, triturating occasionally towards the close; and continue the desiccation, till a fine powder be obtained, entirely free from ammoniacal odour.

Adulterations.—Bicarbonate of potash frequently contains carbonate of potash, from not having been sufficiently saturated with carbonic acid gas during the preparation; this is best detected by the action of corrosive sublimate on a solution in forty parts of water; if the salt contain even a trace of the carbonate, a brick-red precipitate is produced. If any sulphates or muriates be present, a solution supersaturated with nitric acid is precipitated white; with solution of muriate or nitrate of baryta, if the impurity be a sulphate; with solution of nitrate of silver, if the impurity be a muriate.

Th. E.—Bicarbonate of potash may be administered as an antacid in the same cases as solution of caustic potash, its operation being similar; but it is not so powerful as that preparation. It possesses the advantage, however, of being less unpleasant to the taste, and its employment may be continued without interruption for a longer period.

D. & M. of Adm.—Gr. x. to gr. xx., two or three times a day, usually given dissolved in some aromatic water.—*Liquor potassæ effervescens*, L. *Potassæ aqua effervescens*, E. (Bicarbonate of potash, ℥i.; distilled water, Oj.; dissolve the salt in the water, and pass into it carbonic acid under strong pressure, "more than sufficient for saturation; and keep the solution in a well-stopped vessel," L.) *Kali water;* an excellent and agreeable form for the administration of this salt; dose, f℥ij. to f℥viij. three times a day.

Incomp.—Acids; acetate and muriate of ammonia; lime-water; and most of the metallic salts, but not sulphate of magnesia.

Potassæ carbonas impura, L. Lixivum cinis, D. *Impure carbonate of potash; Pearlashes; Potashes.*—Potassæ carbonas e lixivo cinere, D. Potassæ carbonas, L. E. *Carbonate of potash,*

prepared from potashes.—POTASSÆ CARBONAS E TARTARI CRYSTALLIS, D. POTASSÆ CARBONAS PURUM, E. *Carbonate of potash, prepared from crystals of tartar; pure carbonate of potash.* Pearl-ashes or potashes are procured, by lixiviation, from the ashes of many trees and land plants. They are imported in large, deliquescent masses of a dirty bluish-white colour, packed in barrels. They are principally brought from America, where they are prepared in very large quantity from the trees cut down in the clearing of land: purified by the processes mentioned below, they are converted into pure carbonate of potash.

P. P.—Carbonate of potash is met with in the form of coarse, white, crystalline grains, inodorous, with an acrid alkaline taste.

C. P.—It is composed of one eq. of potassa, and one of carbonic acid, combined with an equivalent and a half of water. It attracts moisture from the air, rapidly deliquescing and becoming liquid. By a red heat it is fused, but is not decomposed. It is soluble in less than its own weight of water at 60°, but is insoluble in alcohol. It is highly alkaline, but not caustic.

PREP.—CARBONATE OF POTASH FROM POTASHES. *Dub.* "Potashes, in coarse powder, and cold water, of each, one part; mix with trituration, and macerate for a week in an open vessel, frequently agitating; filter and evaporate to dryness in a perfectly clean silver or iron vessel; towards the end of the evaporation, frequently stirring with an iron spatula; put the coarse powder thus obtained into close vessels. If the potashes be not sufficiently pure, before they are dissolved, roast them in a crucible until they become white." *Lond.* "Impure carbonate of potash, ibij,; distilled water, Oiss.; dissolve the impure carbonate of potash in the water, and strain; then pour it off into a proper vessel, and evaporate the water, that the liquor may thicken; then stir constantly with a spatula till the salt concretes. Carbonate of potash may be procured more pure from the crystals of bicarbonate of potash heated to redness." *Edin.* "Obtained from the potashes of commerce by lixiviation, evaporation, and granulation, by fusion and refrigeration." CARBONATE OF POTASH FROM CRYSTALS OF TARTAR, D. "Take any quantity of crystals of tartar, heat them to redness in a silver crucible lightly covered, until they cease to emit vapours; reduce the residue to a coarse powder, and roast for two hours, with frequent stirring in the same crucible uncovered; then boil it with twice its weight of water for a quarter of an hour; and after due subsidence, pour off the clear liquor; let this be done three times; filter the mixed washings, and evaporate in a silver vessel; reduce the residual salt while becoming dry, by frequent stirring, to a granular form; and then heat it to an obscure red. Before it has perfectly cooled, take it from the vessel, and preserve it in well-stopped bottles." PURE CARBONATE OF POTASH, E. "More readily obtained by heating crystallized bicarbonate of potash to redness in a crucible; but more cheaply by dissolving bitartrate of potash in 30 parts of boiling water, separating and washing the crystals, which form on cooling, heating these in a loosely-covered crucible to redness, so long as fumes are discharged, breaking down the mass and roasting it in an open crucible for two hours, with occasional stirring, lixiviating the product with distilled water, filtering the solution thus obtained, evaporating the solution to dryness, granulating the salt towards the close by brisk agitation, and heating the granular salt nearly to redness. The product of either process must be kept in well-closed vessels."

Adulterations.—As commonly met with in the shops, carbonate of potash contains much water; the quantity present may be known by the loss of weight which the salt suffers when exposed to a red heat; the *Lond. College* state that this should not be more than 16 per cent.; the *Edin. College*, 20 per cent. The presence of sulphates or muriates may be detected by the same tests as those given for the bicarbonate of potash.

TH. E.—As an antacid, it may be employed in the same cases as

the bicarbonate; but in consequence of its unpleasant taste and irritant, even poisonous properties, it is not much used in medicine. In pharmacy it is employed for the preparation of caustic potash, the bicarbonate, &c. When this salt has been taken in poisonous doses, the best antidotes are vinegar, lemon juice, or fixed oil.

D. & M. OF ADM.—Gr. v. to gr. xx., largely diluted.—*Potassæ carbonatis aqua*, D.—*Liquor*, L. (Carbonate of potash (from crystals of tartar, D.), one part (ʒxx., L); distilled water, 2 parts (Oj., L.); dissolve and strain. "Sp. gr. 1320," D.). A convenient strength for internal use; dose, min. x. to fʒi., in milk or in some aromatic water.

INCOMP.—Same as the bicarbonate; but sulphate of magnesia is decomposed by the carbonate.

SODÆ BICARBONAS, D. E. SODÆ SESQUICARBONAS, L. *Bicarbonate of soda; Sesquicarbonate of soda.*

P. P.—Usually in the form of a fine, white powder, but sometimes it is met with in small, indistinct crystals; it is inodorous, but has a mild alkaline taste.

C. P.—It is composed of one eq. of soda, two of carbonic acid, and one of water. It is permanent in the air; by a moderate heat, the water and one eq. of carbonic acid are expelled, and it is reduced to the state of carbonate. It requires 13 parts of water at 60° for its solution, but a much less quantity of boiling water; in the latter it loses one fourth of its acid, and becomes the sesquicarbonate. The solution is faintly alkaline; it effervesces with acids, but does not precipitate with the salts of magnesia.

PREP. — *Dub.* "Carbonate of soda, two parts; water, five parts; dissolve; expose the solution in a proper apparatus to the stream of carbonic acid gas procured from the solution of white marble in dilute muriatic acid, until it ceases to absorb the gas, and set it aside, that crystals may form; evaporate the liquor at a temperature not above 120°, and crystallize by cooling; mix those crystals with the former; dry, and preserve in a close vessel." *Edin.* "Fill with fragments of marble a glass jar, open at the bottom, and tubulated at the top; close the bottom in such a way as to keep in the marble without preventing the free passage of a fluid; connect the tubulature closely by a bent tube and corks with an empty bottle, and this in like manner with another bottle filled with one part of carbonate of soda, and two parts of dried carbonate of soda, well triturated together; and let the tube be long enough to reach the bottom of the bottle. Before closing the last cork closely, immerse the jar to the top in diluted muriatic acid, contained in any convenient vessel; when the whole apparatus is thus filled with carbonic acid gas, secure the last cork tightly; and let the action go on till next morning, or till gas is no longer absorbed by the salt. Remove the damp salt which is formed, and dry it either in the air without heat, or at a temperature not above 120°." SESQUICARBONATE OF SODA, *Lond* "Carbonate of soda, ℔vij.; distilled water, cong. j.; dissolve, and strain; then pass carbonic acid into the solution to saturation, that the salt may subside; dry this with a gentle heat, wrapped and pressed in cloth."

Adulterations.—The only one of importance is with the simple or monocarbonate, and this is seldom wanting; it may be readily detected by the action of solution of corrosive sublimate, which gives a reddish-brown precipitate with a solution of the bicarbonate in 40 parts of distilled water, if it contain so much as a hundredth part of the carbonate.

TH. E.—In the various forms of dyspepsia attended by secretion

of acid and vomiting, no remedy is employed so frequently as the bicarbonate of soda. It is usually taken in solution with excess of carbonic acid. In lithiasis, and in gout and rheumatism where there is excessive secretion of uric acid and the urates, it is not so well adapted as the potash preparations, for the salt formed with soda and uric acid is extremely insoluble, being, in fact, the composition which is deposited in the joints of persons who suffer from repeated attacks of gout.

D. & M. OF ADM.—Gr. x. to ʒss., dissolved in water.—*Aqua carbonatis sodæ acidula*, D. *Liquor* (*Aqua*, E.) *sodæ effervescens*, L. E. (Bicarbonate (carbonate, D.) of soda, ʒi; water (distilled, L.), *by measure*, ℔j. (Oj., L. E.); dissolve; and, in a proper apparatus, pass into it a stream of carbonic acid gas (obtained from the solution of white marble in muriatic acid diluted with six parts of water, D.) until it is more than saturated: keep in well-stopped vessels.) This constitutes *soda-water*, the form in which the bicarbonate is most generally used; as met with in the shops, however, soda-water is seldom anything more than a simple solution of carbonic acid in water, not containing any carbonate of soda; this may be easily known by adding tartaric acid to the solution; when it has ceased to effervesce after being poured from the bottle, no farther effervescence will take place, unless the alkaline carbonate be present. Dose, fʒvj. or fʒviij., two or three times a day. *Trochisci sodæ bicarbonatis*, E. (Bicarbonate of soda, ʒi.; pure sugar, ʒiij.; gum-arabic, ʒss.; pulverize them; and with mucilage beat them into a proper mass for making lozenges.) In acidity of the stomach, *ad libitum*.

INCOMP.—Acids; lime-water; muriate of ammonia; metallic salts, except those of magnesia.

SODÆ CARBONAS VENALE, *sive*, BARILLA, D. SODÆ CARBONAS IMPURA, L. *Impure carbonate of soda; Barilla.* SODÆ CARBONAS, D. L. E. *Carbonate of soda.*—Impure carbonate of soda or barilla is obtained by burning to ashes several terrestrial plants which belong to the natural family *Chenopodiaceæ*, and which usually grow on the seashore. It is imported in the form of hard, grayish-blue masses, not deliquescent, packed in barrels. It is chiefly brought from Sicily, France, and the East Indies. It is only employed for yielding carbonate of soda by the processes mentioned below. In the present day, however, carbonate of soda is prepared on the large scale from sulphate of soda by a complicated process, the details of which will be found in all modern works on chemistry.

P. P.—Carbonate of soda occurs in large, transparent crystals, or fragments of crystals, the primary form of which is an oblique rhombic prism. They are inodorous, but have a disagreeable, alkaline, somewhat caustic taste. Sp. gr. 1·623.

C. P.—It is composed of one equivalent of soda, one of carbonic acid, and ten of water. It effloresces when exposed to the air; by heat it is fused in its water of crystallization, which is expelled, and a white anhydrous salt left, which again becomes liquid at a red

heat, but is not decomposed. The crystals are soluble in twice their weight of water at 60°, and in their water of crystallization at 212°. The solution is powerfully alkaline.

Prep.—*Dub.* "Barilla, reduced to powder, one part; water, two parts; boil the barilla in the water for two hours, occasionally stirring; strain the liquor, and, having triturated what remains of the barilla, boil again with the same quantity of water; repeat this procedure a third time. Evaporate the filtered and mixed washings in an open iron vessel to dryness, avoiding so high a heat as might again liquefy the salt; stir with an iron spatula until the mass becomes white; then dissolve in boiling water, and evaporate the liquor to a specific gravity of 1220, and expose to the air at a temperature of about 32°, that by cooling crystals may be formed, which are to be dried and kept in a well-closed vessel. If the salt should not be sufficiently pure, repeat the solution and crystallization." *Lond.* "Impure carbonate of soda, ℔ij.; distilled water, Oiv.; boil the salt in the water, and strain it while yet hot; lastly, set it aside, that crystals may be formed." In the *Edin. Pharm.*, carbonate of soda is an article of the Materia Medica.

Adulterations.—The impurities usually met with in carbonate of soda are sulphates and muriates; they may be detected in the manner indicated, when they are present in carbonate of potash (which see).

Th. E.—Carbonate of soda is not employed as an antacid so frequently as the bicarbonate, in consequence of its disagreeable taste; it may, however, be used in the same cases.

D. & M. of Adm.—Gr. x. to ʒss.; dissolve in water.—*Sodæ carbonas siccatum*, D. E. *Sodæ carbonas exsiccata*, L. (Heat any quantity of crystallized carbonate of soda in a proper (silver, D.) vessel (stirring frequently, D.) till it is dry (afterward heat to redness, L. E.); reduce to powder, and keep in well-stopped bottles.) Thus dried, carbonate of soda may be given in the form of powder or pill; it has a very caustic taste; therefore, when given in powder, especially to children, it should be combined with some bland substance, as tragacanth, to conceal its acrimony. Fifty-four grains of the dried carbonate of soda are equal to 144 grains of the crystallized salt. Dose, gr. v. to gr. xx.—*Sodæ carbonatis aqua*, D. (Carbonate of soda, any quantity; dissolve it in water, so that the specific gravity of the solution may be to that of distilled water as 1024 to 1000. A liquor of this specific gravity may be obtained by dissolving ʒi. of carbonate of soda in ℔i., *by measure*, of distilled water.) A convenient strength for internal use; dose, fʒss. to fʒj.

Incomp.—Acids, and their salts; lime-water; and magnesia.

CHAPTER II.

ANTHELMINTICS.

(Vermifuges.)

Anthelmintics are remedies which possess the property of destroying worms, or expelling them from the intestinal canal. Besides the specific, or more immediate anthelmintics, which are only

described in this division, many of the more active cathartics will effect this purpose; and they should always be administered in conjunction with the specific remedies, the efficacy of which they tend much to increase. As the action of those remedies, however, is merely temporary, it will be requisite, as soon as the worms are expelled, to employ means calculated to restore the digestive organs to a healthy action, and to correct that peculiar state of them which promotes the generation of intestinal worms. The means best calculated for this purpose are, keeping the surface of the body warm by proper clothing, a light but nutritious diet with a moderate use of common salt, and, at the same time, the administration of bitter tonics with gentle aperients, and, if anæmia be present, the preparations of iron.

[There is no topic upon which the profession is so justly chargeable with uncertainty and palpable error as it is with reference to the treatment of diseases attributed to worms in the alimentary canal, by remedies denominated anthelmintics, to which the specific property of destroying worms is ascribed. It is well known that the existence of living worms in the stomach and bowels is often found to be consistent with otherwise sound health, and that they often spontaneously escape from the body per os and per anum, when no previous evidence of their existence has been discernible, and when no other disturbance of health can be detected. This is often observed in schoolboys who partake freely of unripe fruit; and these worms are of the variety called lumbrici, and they are often found in the bowels of persons who have been killed when in high health. Still, however, this same kind of worms is found in children and persons of bad general health, and sometimes accumulating in such numbers as to become a source of disease, and require remedies for their destruction and removal. In most cases, however, even of this character, the worms are often the *effect* of pre-existing disease, and by no means its primary *cause*, notwithstanding their presence may now be the only apparent source of mischief. Especially will it be found in children that their digestive organs have been impaired for a long time and their health frail and feeble, before any suspicion of worms could be gathered from the symptoms. And in a multitude of examples, anthelmintics, supposed to be specific in their action, are given for weeks and months, when there is not only no proof of the existence of worms, but when the ultimate history of the patient proves that he has only suffered from the suspicion of being troubled with worms, while his malady has been all the while of another and a different character. This discovery is, however, very often delayed until all the articles of this class and many more have been tried in vain, and until mothers, nurses, doctors, and quacks have drugged the patient to surfeiting with worm nostrums and vermifuges of every variety.

The author has judiciously stated in the preceding paragraph, that the action of anthelmintics is "merely *temporary*," even when they act at all. This is true, so far as the worms are concerned, when there happen to be any in the case; but the patient who has

taken "an ounce of garlic swallowed whole," or an equal quantity of "*tin filings*," and followed these with a drachm of cowhage or a draught of "two ounces of spirits of turpentine," will be slow to confess that their action upon his stomach and bowels has been "merely temporary," and is often condemned to find the results disastrously permanent; even when taking these worm medicines has only proved, as it often does to the satisfaction of the physician, that there are no worms in the case, and that anthelmintics are uncalled for.

The truth is, that no certain diagnosis of worms other than their appearance in the discharges is worthy of confidence, and hence, without this ocular proof, the use of anthelmintics is of equivocal propriety. And even where the symptoms of intestinal irritation lead to the suspicion of worms, to "restore the healthy action of the digestive organs," and correct the morbid state which "promotes the generation of intestinal worms," these are the true indications. It need scarcely be said, that the medicines arranged under this class are not those best adapted to this purpose, but are correctly pointed out by the author in the last sentence of the preceding paragraph.

It is only when the presence of worms is definitely ascertained that any of the specific anthelmintics, as they are here called, are at all adapted to the case, and then only for merely "temporary" purposes, and quickly followed by cathartics, unless they possess this property in common with their specific virtue. The turpentine will be found to be the most successful of any, especially in tape-worm and in ascarides, in which latter case it should be used as an enema, as this species only infest the rectum.]

Allium sativum, D. L. E. *Garlic.* A native of Italy, Sicily, and the South of France, commonly cultivated in our gardens; belonging to the class *Hexandria*, order *Monogynia* in the Linnæan arrangement, and to the natural family *Liliaceæ*.

B. C.—Stem a foot and a half to three feet high, surrounded with many linear grass-like leaves, and bearing a head of many whitish flowers emerging from a membranous spatha.

P. U. & M. of Prep.—The bulb; it is dug up for use in the month of August, cleaned and dried in the sun, and kept in bunches in a dry place.

P. P.—The bulb, as it is termed, consists of several small bulbs, called cloves, grouped together within a common membranous covering; when dry, of a dirty whitish colour, and a withered aspect; the cloves, which have each their proper covering, are white and succulent, of a strong, disagreeable, peculiar odour, and an acrid, pungent taste.

C. P.—Garlic consists of an acrid volatile oil, fecula, albumen, and a saccharine matter; its medical properties depend on the volatile oil, which is heavier than water, of a yellowish colour, and a very penetrating odour; it contains some sulphur.

Th. E.—Garlic, though now seldom employed as an anthelmintic in regular practice, is an excellent remedy in ascarides. Roque states that he has met with great success by giving the infusion by

the mouth and in clyster, and, at the same time, causing friction to be made with a liniment over the abdomen.

D. & M. OF ADM.—In substance, ʒss. to ʒj. swallowed whole, or made into pills with soap; of the expressed juice, min. xx. to min. xxx. on sugar; of an infusion prepared by infusing ʒss. of the bulb in fʒij. of water or milk, fʒij. to fʒiij. two or three times daily.—*Sirup of Garlic* (Garlic, one part; boiling water, eight parts; sugar, sixteen parts); dose, fʒss. to fʒj.

ARTEMISIA SANTONICA, SEMINA, D. *Worm-seed.* The substance which is met with in the shops under this name is imported from Barbary and the Levant, and appears to be a mixture of fragments of flower-buds and their footstalks. It is incorrectly stated by the Dublin College to be the seeds of the plant above named.

P. P.—The fragments are smooth, of a greenish-yellow colour; have a strong, aromatic odour, and a bitter taste.

C. P.—It contains a bitter, resinous, extractive matter, and an acrid volatile oil.

TH. E.—Not much employed now in this country, though still considered a very excellent anthelmintic in several parts of the Continent. It is used in cases of ascarides and lumbrici.

D. & M. OF ADM.—Gr. xx. to gr. xxx., made into an electuary with honey, may be given to children night and morning, followed by a brisk purge.—*Vermifuge powder*, P. (Worm-seed; Corsican moss; wormwood; tansy; scordium; senna; and rhubarb, of each equal parts); dose, ʒss. to ʒi.—*Vermifuge bolus*, P. (Worm-seed, gr. viij.; calomel, gr. ij.; camphor, gr. vj.; sirup, q. s for one bolus). Dose, one to two daily.

GEOFFROYA INERMIS, CORTEX, D. ANDIRA INERMIS (KUNTH). *Cabbage-tree bark.* A native of Jamaica, belonging to the class *Diadelphia*, order *Decandria*, and to the natural family *Leguminosæ*.

B. C.—A tree of considerable size, with pinnate leaves, and reddish-lilac flowers in panicles, with short pedicles.

P. P.—In rather thick fibrous pieces, of a brownish-ash colour. It has a heavy odour, and a mawkish bitter taste; is pulverulent, the powder resembling jalap.

C. P.—It contains a brownish-yellow, crystalline, very bitter, alkaline substance, which has been named *Jamaicina*, and on which its medicinal properties depend, colouring matter, gum, fecula, woody fibre, &c.

TH. E.—A powerful anthelmintic, especially in cases of the lumbrici; but in consequence of its frequently producing vomiting, hypercatharsis, and even delirium, it is now seldom employed; administered with due caution, however, it is an excellent vermifuge. Brera states that he has found it peculiarly efficacious when combined with valerian.

D. & M. OF ADM.—It should be commenced in small doses; of the powdered bark, gr. xv. to gr. xxx.—*Decoctum Geoffroyæ*, D. (The bark, bruised, ʒj.; water, *by measure*, ℔ij.; boil down to ℔j.;

and to the strained liquor add sirup of orange, ʒij.) Dose, for an adult, fʒss. to fʒi.; for a child, fɜss. to fɜiss. If fever, delirium, or other disagreeable effects arise from its use, warm water should be first given, then castor oil, followed by opiates.

Gigartina Helminthocorton. *Corsican Moss.* A native of the shores of the Mediterranean about Corsica. The substance known in the shops as Corsican moss consists of fragments of a great variety of Algæ; Decandolle enumerates no less than five-and-twenty. A small, though the most essential part of the mixture, is the plant above named.

P. P.—Corsican moss, as met with in commerce, consists of brownish filaments mixed with broken, irregular fronds, having whitish or greenish articulations; it has a nauseous odour, and an acrid, bitter taste.

C. P.—It consists of vegetable jelly, the nature of which is not well known, vegetable fibre, salts of lime and soda, a trace of iron, manganese, and silica. Its active principle is soluble in water.

Th. E.—Corsican moss has been used by the natives of Corsica for several centuries, as a remedy for intestinal worms; it appears to be useful in cases of lumbrici. Bremser speaks highly of its anthelmintic properties, which he ascribes to the chloride of sodium it contains.

D. & M. of Adm.—In powder, gr. x. to ɜij., made into an electuary with honey or treacle.—*Infusion of Corsican moss* (Corsican moss, ʒiss.; boiling water, fʒiv.). Dose, fɜij. to fʒss., in a cupful of water or milk. *Jelly of Corsican moss*, P. (Corsican moss, ʒj.; sugar, ʒij.; white wine, fʒij.; isinglass, ɜss.; boil and strain). Dose, ɜj. or ɜij.

Mucuna pruriens, L. E. [and U. S. P.] Dolichos pruriens, D. *Cowitch.* A native of the West Indies, belonging to the class *Diadelphia*, order *Decandria*, and to the natural family *Leguminosæ*.

B. C.—A twining shrub, bearing purplish flowers, with a disagreeable, alliaceous odour, in axillary racemes, succeeded by coriaceous legumes, each containing three to five seeds.

P. U.—The spiculæ, or hairs, of the legumes.

P. P.—The entire legumes, with the hairs attached, are usually imported; they are shaped like the letter *f*, of a brownish colour, from two to four or five inches long, thickly clothed with strong brown bristles, or setæ, which, examined by the microscope, appear finely acuminate and serrated towards the point; these bristles separate easily, and adhere obstinately to the skin, producing intolerable itching, accompanied with intense heat, and sometimes pain and swelling.

C. P.—The hairs contain tannin, according to Martius, but no acrid principle.

Th. E.—The operation of cowitch, as an anthelmintic, seems to be completely mechanical; the minute hairs wounding and irritating the worms, thus obliging them to let go their hold on the coats of the intestine, which is protected from injury by its mucous se-

cretion. It is chiefly serviceable in cases of ascarides and lumbrici, having but little effect on the tape-worm; indeed, by many practitioners it is esteemed, and not without reason, as the best vermifuge for the lumbrici.

D. & M. of Adm.—The legumes are dipped in sirup, and then scraped, so as to remove the setæ; this process is repeated with fresh legumes until the sirup acquires the consistence of honey; of this a teaspoonful is given to a child, or a table-spoonful to an adult, for three successive mornings before breakfast, and the last dose followed by a brisk purge.

Nephrodium filix mas, E. Aspidium filix mas, D. L. *Male Shield Fern.* Indigenous; belonging to the Linnæan class and order *Cryptogamia Filices*, and to the natural family *Filices.*

B. C.—Rhizome, or underground stem, large, tufted, scaly; producing in spring beautiful fronds or leaves, pinnate, with oblong, serrated, obtuse leaflets.

P. U. & M. of Prep.—The rhizome; it should be dug up in summer, cleared of root fibres, &c., but not washed, and dried quickly and thoroughly in the open air without heat, in the shade; the tufts, and those parts of the root-stock which are greenish internally, should alone be kept; they should be reduced to powder immediately, and preserved in well-stoppered bottles; the druggists' stock should be renewed annually, as in two years it loses its medical properties.

P. P.—The powdered root is of a greenish-yellow colour, of a rather disagreeable odour, and a nauseous, bitter, somewhat astringent taste.

C. P.—It contains a small portion of volatile oil, on which its anthelmintic properties seem to depend; some fixed oil, fecula, uncrystallizable sugar, gum, and woody fibre.

Th. E.—The powder of the male fern-root is perhaps the most efficacious anthelmintic we possess in the treatment of tænia; and as an indigenous remedy, it is especially worthy of attention. Bremser, however, in his treatise on intestinal worms, states that, "though an excellent remedy against *Bothriocephalus latus* (the tape-worm of the Swiss), it is not so efficacious against *Tænia solium* (the tape-worm of this country)." It acts as a poison to the worms, as they are discharged dead in all cases.

D. & M. of Adm.—Powder, ʒi. to ʒiij.; it should be given in the morning early, and followed in two hours afterward by a brisk purge. *Oleum Filicis Maris*, Dr. Peschier. (The tufts of the rhizome are reduced to a moderately fine powder, exhausted with ether and the ethereal liquor distilled.) Dose, min. xx. to min. xxx., dropped on sugar, or made into an emulsion with almond mixture; half of this dose is given at bedtime, and the remainder on the following morning; if it do not purge, an active cathartic should be given in the afternoon of the same day.

Petroleum Barbadense, D. L. E. *Petroleum; Rock oil; Barbadoes tar.* A mineral production, found floating on the waters of springs and lakes in several of the West India islands.

This substance, though still retained in the British pharmacopœias, is altogether discarded from practice. It was formerly em-

ployed in cases of tape-worm, both inwardly, in form of emulsion, and externally, by friction over the abdomen.

PUNICA GRANATUM., RADICIS CORTEX, D. GRANATI RADIX, E. *Pomegranate bark; Bark of the root of Punica Granatum.* A native of the North of Africa, introduced into the South of Europe, where it now grows freely; belonging to the class *Icosandria*, order *Monogynia* in the Linnæan arrangement, and to the natural family *Myrtaceæ*.

B. C.—A small, handsome tree, growing to the height of twenty feet, with a brownish bark, and smooth leaves on short footstalks; it produces in July, at the extremities of the young branches, splendid rich scarlet flowers, which are succeeded by the orange-like fruit, crowned with the hardened persistent calyx.

P. P.—Pomegranate bark is usually met with in short quills, or portions of quills, of a grayish-yellow colour externally, yellowish internally, brittle, not fibrous, with a faint odour, and an astringent taste.

C. P.—According to Mitouart's analysis, it consists of tannin, wax, a sweetish substance (part of which is soluble in alcohol, and part in water; the former crystallizable, the latter having the characters of Mannite), and free gallic acid in large quantity.

Adulterations.—The root bark of the common barberry (*Berberis vulgaris*), and of the box-tree (*Buxus sempervivens*), are said to be sometimes substituted for that of the pomegranate: the fraud is easily detected, as neither of these substances, although very bitter, possesses the least astringency.

TH. E.—The bark of the root of the pomegranate is an excellent vermifuge in cases of tape-worm, and is much employed in various parts of Europe; but it is chiefly used in India, where it is said scarcely ever to fail, if properly administered: some practitioners state that it should not be employed unless joints of the worm have already come away naturally.

D. & M. OF ADM.—Two ounces of the bruised bark are macerated for twenty-four hours in two pints of water, then boiled to one half, and filtered; this is given in three doses, with an interval of half an hour between each dose: vomiting frequently occurs after the first or second dose; but this should not prevent us from administering the third. Soon afterward the patient passes many stools, in which joints of the worm are expelled. The doses should be occasionally repeated for four or five days after fragments of the worm have ceased to come away.

SABADILLA, L. E. *Cevadilla.* [U. S. P. *Veratria.*] *Fruit of Helonias officinalis*, L.; *of Veratrum Sabadilla, of Helonias officinalis, and probably of other Melanthaceæ*, E.; *of Asagræa officinalis*, LINDLEY. A native of Mexico, belonging to the class *Polygamia*, order *Monœcia* in the Linnæan arrangement, and to the natural family *Melanthaceæ*.

B. C.—A bulb, sending up numerous grassy leaves, from the centre of which springs an annual stem, about six feet in height, terminated by a spike of small white flowers, succeeded by numerous trifollicled capsules.

P. P.—The fruit consists of three follicles, oblong, adherent at the base, about half an inch in length; they are composed of a thin, yellowish, elastic membrane, containing from one to three shining black seeds; the seeds have little odour, but when powdered and snuffed into the nostrils, they produce violent sneezing and discharge of mucus: they have an acrid, intensely bitter taste, which is very permanent.

C. P.—Cevadilla consists of fatty matter, *cevadic acid*, wax, *veratria* combined with gallic acid, yellow colouring matter, and gum.

Th. E.—Although possessed of highly poisonous properties, cevadilla has been employed internally as an anthelmintic with much success in cases of tape-worm and of ascarides; its use has been hitherto almost entirely confined to the Continent, and from the numerous instances of its successful employment recorded by different practitioners, it appears deserving of a high character as a vermifuge.

D. & M. of Adm.—Powder, gr. iij. for eight successive mornings fasting, followed on the ninth day by an active purge, in cases of tænia.—*Enema of cevadilla* (Cevadilla, ʒij.; water fʒx; milk, fʒviiij.: the cevadilla is boiled in the water until it is reduced to seven ounces, then filtered, and the milk added). To be administered in cases of ascarides.

Spigelia, L. E. Spigelia Marilandica, radix, D. *Carolina pink; root of Spigelia Marilandica.* A native of the United States, belonging to the Linnæan class and order *Pentandria Monogynia*, and to the natural family *Gentianaceæ.*

B. C.—A perennial root, sending up numerous simple stems, bearing, in the month of July, rich, carmine-coloured flowers, in racemes.

P. P.—Usually met with in bundles about twenty inches long, consisting of numerous slender, yellowish-brown fibres, proceeding from a small, dark-brown rhizome: they have a faint odour, and a bland, somewhat nauseous taste.

C. P.—The root consists of acrid resin, tannin, bitter extractive, and woody fibre, with a trace of fixed oil.

Th. E.—Spigelia root, in consequence of its being much more active in the recent state than when dried, bears a higher character as an anthelmintic in America than in Europe. It is the most popular vermifuge in the United States for the expulsion of lumbrici, possessing, however, little or no powers over any other species of intestinal worm.

D. & M. of Adm.—In powder, gr. x. to gr. xx. for children. *Infusum spigeliæ*, U. S. (Spigelia root, ʒss.; boiling water, fʒxvj.; macerate for two hours and strain.) Dose, fʒss. to fʒi. for a child; four times the quantity for an adult. However administered, it should be always followed by a strong mercurial purge.

Stanni pulvis, D. L. E. *Powder of Tin.*—Tin is found in nature chiefly in the form of peroxide, existing in large quantities in Cornwall, in South America, and in the East Indies.

P. P.—Metallic tin is of a bluish-white colour, brilliant, soft, and malleable, with but little tenacity; it emits a slight peculiar odour when rubbed. Sp. gr. 7·3.

C. P.—It melts at 442° F.; if the heat be increased, it oxydizes rapidly, and at a red heat burns brightly; it dissolves slowly in dilute muriatic acid, but rapidly if the acid be strong and boiling: nitric acid, slightly diluted, acts on tin with great violence; heat is produced, orange fumes disengaged, and pure peroxide of tin is formed.

Prep.—The metal is separated from the impurities which exist with it in the ore by smelting and liquation. For medical purposes, it is reduced to powder by agitating it while in a state of fusion in a wooden box, the inside of which has been rubbed with chalk (in a mortar previously heated, triturating briskly as it cools, E.), and separating the finer particles by means of a sieve.—*Dub.*, *Edin.*

Adulterations.—Pewter filings are sometimes substituted for tin filings in commerce; and Christison says that lead powder is not unfrequently sold for powder of tin. These adulterations may be detected by first acting on the specimen with nitric acid, so as to convert it into the peroxide, boiling the powder thus obtained with distilled water, when, should the tin be pure, the water will not precipitate with solution of sulphate of magnesia.

Th. E.—Powder of tin is a most effectual anthelmintic, especially for children, in cases of lumbrici; not so useful in cases of ascarides, and producing little or no effect in cases of tænia. It appears to act mechanically, and, consequently, its administration should be always followed by an active cathartic.

D. & M. of Adm.—℥ss. to ʒi. made into an electuary, with an equal quantity of honey or treacle.

Tanacetum vulgare, folia, D. *Common Tansy.*—Indigenous; belonging to the class *Syngenesia*, order *Polygamia superflua*, in the Linnæan arrangement, and to the natural family *Compositæ*.

B. C.—Stem two to three feet high, bearing a corymb of yellow flowers.

P. P.—The whole plant has a disagreeable, camphoraceous odour, and a nauseous, bitter, aromatic taste.

C. P.—The only important constituents of the plant are bitter resin and volatile oil.

Th. E.—Though rarely employed in regular practice, it is frequently administered as a vermifuge with much benefit as a domestic remedy; it is only applicable for cases of lumbrici.

D. & M. of Adm.—In powder, ℈i. to ʒi. *Infusum Tanaceti* (leaves, ʒij.; boiling water, Oj.; macerate for an hour). Dose, fʒi. or fʒij.

Terebinthinæ oleum, D. L. E. *The volatile oil distilled from the liquid resinous exudation* (Terebinthina vulgaris, D. L.) *of various species of Pinus and Abies* (Edin.). *Of Pinus sylvestris* (Dub., Lond.). *Oil of Turpentine; Spirits of Turpentine.*—The trees from which the varieties of common turpentine met with in commerce are procured are inhabitants of the forests of the colder

regions of Europe and North America, and most of them are cultivated in the British Isles; they are placed in the natural family *Coniferæ*, and in the Linnæan class and order *Monœcia Monadelphia*.

Prep.—*Common Turpentine, Terebinthina vulgaris*, is procured in America by cutting off the outer bark near the root of the tree, and making an incision through the inner bark into the wood; as the turpentine exudes, it flows into a hole dug in the earth, whence it is removed into casks. *Volatile oil of turpentine* is an article of the Materia Medica in the L. and E. P.s, being always prepared by the manufacturer on the large scale. The Dublin College gives the following formula for its preparation: "Common turpentine, *by weight*, ℔v.; water, *by measure*, ℔iv.; distil the oil from a copper alembic; yellow resin will remain after the distillation." This oil is farther directed to be purified; *Oleum Terebinthinæ purificatum*, L. E.—*rectificatum*, D. (Oil of turpentine, *by measure*, ℔ij. (Oj., L. E.); water, *by measure*, ℔iv. (Oiv., L. E.); distil till ℔iss. *by measure* of the oil be obtained (distil the oil cautiously, L. E.).

P. P.—Oil of turpentine is a transparent, colourless, limpid fluid; of a peculiar, penetrating, balsamic odour; and a pungent, bitter, disagreeable taste. Sp. gr. ·872 at 50° F.

C. P.—It is composed of C^{20} H^{16}. It is very soluble in ether, less so in alcohol, and very sparingly soluble in water. Exposed to the air, it gradually absorbs oxygen, thickens, and becomes yellowish. It boils at 314°, and cooled down to —17° it deposites white crystals *stearopten*, which are heavier than water. Oil of turpentine is very inflammable, burning with a heavy, yellowish flame, and much smoke; in chlorine gas it takes fire spontaneously.

Not liable to adulteration.

Th. E.—As the most effectual remedy we possess for the expulsion of tape-worm, oil of turpentine stands deservedly in high repute. It operates as a specific poison to the parasite, causing its immediate death, and afterward, in consequence of its cathartic properties, expelling it from the body. It has also been used with much benefit in the form of enema for ascarides in the rectum.

D. & M. of Adm.—*As an anthelmintic;* for adults, f℥ss. to f℥ij.; for children, f℥i. to f℥ss. It may be given either floating on the surface of water, or made into an emulsion with mucilage (of which it requires equal portions), or with yolk of egg (one to every ounce). *Enema Terebinthinæ*, D. L. E. (Common turpentine, ℥ss. (oil of turpentine, f℥j., L. E.); yolk of one egg (a sufficiency, L. E.); water (of a temperature not exceeding 100°, D.), (decoction of barley, L.), f℥x. (f℥xix., L. E.); rub the oil and the yolk together, and add the water gradually, D.E.—Mix, L.).

CHAPTER III.

ANTISPASMODICS.

Antispasmodics, as their name indicates, are medicines which counteract irregular or inordinate muscular action—*spasm*. This deranged state of the system depends on so many different causes, and is produced by so many different sources of irritation, that its

successful treatment will very frequently depend on the employment of remedies calculated to remove the more immediate cause or source of irritation by which the spasmodic affection is produced. It follows, therefore, that under peculiar circumstances, the remedies which will be found most successful in counteracting spasm must be derived from very different divisions of the Materia Medica; and thus the term Antispasmodic will become applicable to a *narcotic*, a *sedative*, a *stimulant*, a *cathartic*, or a *tonic*. There are, however, certain medicines which appear to exert a direct control over spasmodic action independent of any influence upon its exciting causes, and these will form the subject of our inquiry in the present chapter.

[The foregoing remarks are discriminating and judicious, and yet no allusion is made to three of the most potent means which our art recognises among its resources for subduing spasm, and without which neither of those here named can always be relied on. *Emetics* are among our most useful and efficient antispasmodics, and even when given only in nauseating doses, often without being carried far enough to excite vomiting, by relaxing the muscular fibre, upon the constriction of which spasmodic diseases depend, will afford speedy relief. But the *lancet* is our most certain, speedy, and effectual antispasmodic, and a *full bleeding* drawn from a large orifice, the patient being placed in an erect position so as to favour syncope, will be found best adapted to relieve those violent and rapid spasms which endanger life, and even when all the rest may have been used in vain. The *warm bath*, of which valuable remedy in spasm no mention is made, though it may be called "non-medical," is, nevertheless, an agent of great importance singly employed, and invaluable as an auxiliary in severe and protracted spasm, especially when the bowels are involved in the disease.]

Assafœtida, D. L. E. *Gummy, resinous exudation of Ferula assafœtida; probably, also, of Ferula Persica* (Edin.).—A native of Persia, especially the provinces of Khorasan and Laristan; belonging to the Linnæan class and order *Pentandria Digynia*, and to the natural family *Umbelliferæ*.

B. C.—The root is long, tapering, of the thickness of a man's leg, black externally, white and juicy internally; of a powerful alliaceous odour, sending up many radical leaves, about two feet long; and after some years a round stem, clothed with leafless sheaths, eight or nine feet high, and bearing yellow flowers in umbels, succeeded by flat, thin, reddish-brown fruit. The whole plant dies after it has once flowered and ripened its seed.

M. of Prep.—When the plant is four years old, the root-leaves are removed, and in forty days afterward the top of the root is sliced off; a fetid juice exudes, which concretes in a couple of days, is then scraped off, and a fresh slice of the root made; more juice exudes, is collected as before, and the same process repeated from ten to twelve times within six weeks, until the root is completely exhausted. The juice is exposed to the sun to become harder, packed in casks and cases, which are sent, by way of Bombay, to Europe.

P. P.—Assafœtida is met with in commerce in irregular lumps from half a pound to three pounds in weight; of a pinkish-yellow and reddish-brown colour externally; when recently cut, of a

pearl-white colour with a waxy lustre; but, on exposure to the air, rapidly acquiring a rose tint. It has a powerfully disagreeable, peculiar, alliaceous odour, and a strong, bitter, acrid taste. Sp. gr. 1·31 to 1·35.

C. P.—It is composed of 48·85 per cent. of resin, 4·60 of volatile oil, 19·40 of gum with traces of saline matters, 9·70 of sulphate and carbonate of lime, with some bassorin, extractive, lignin, &c. (Brandes). The resin and volatile oil are the medicinal principles. Exposed to the air, it is apt to become very hard, owing to the presence of the sulphate of lime, the *setting* of which is supposed to be the cause. Assafœtida softens with a moderate heat; and is inflammable, burning with a fuliginous flame. It is partially soluble in alcohol, ether, and vinegar; and it may be formed into an emulsion with water. It is reduced to powder with difficulty, unless triturated with carbonate of potash.

Th. E.—Assafœtida is a powerful stimulating antispasmodic, especially adapted for the spasmodic nervous diseases of females, as hysteria, and some forms of chorea and epilepsy. No remedy we possess is so successful in the treatment of hysteria, administered either during the paroxysm or in the interval; in a hysteric paroxysm, we are frequently unable to administer medicines by the mouth; when, given in the form of enema, assafœtida is found to be very effectual. In the convulsions of infants, especially when dependant on flatulence, and in the flatulent constipation of the aged, few remedies are more efficacious. It has also been employed with much benefit in the chronic spasmodic stage of hoopingcough, in pure spasmodic asthma, and in that peculiar spasmodic difficulty of breathing, so frequently the attendant of chronic catarrh. Assafœtida has been also used as a vermifuge.

D. & M. of Adm.—Gr. x. to ʒss., in pills or emulsion. *Mistura Assafœtidæ*, D. L. (Assafœtida, ʒi. (ʒv., L.); pennyroyal water, fʒviij. (water, a pint, L.); rub the assafœtida with the water, gradually poured in, until an emulsion is formed.) Dose, fʒss. to fʒiss.; used also as an enema for children.—*Tinctura Assafœtidæ*, D. L. E. (Assafœtida, ʒiv. (ʒv., L. E.); rectified spirit, *by measure*, ℔ij. (Oij., L. E.); (water, fʒviij., D.); macerate for 14 (7, E.) days, and filter.) Dose, fʒss. to fʒij.—*Æther Assafœtidæ*, P. (Assafœtida, 1 part; sulphuric ether, 4 parts; dissolve.) Dose, min. xx. to min. xxx.—*Spiritus Ammoniæ fœtidus*, D. E. (Spirit of ammonia, *by measure*, ℔ij. (fʒxss., E.); assafœtida, ʒi¼ (ʒss., E.); macerate for three days; distil ℔iss., *by measure*, D. Macerate for 12 hours; distil fʒxss., E.)—L. (Hydrochlorate of ammonia, ʒx.; carbonate of potash, ʒxvj.; rectified spirit, and water, of each, Oiij.; assafœtida, ʒv.; distil with a slow fire three pints). Dose, fʒi. This is merely a solution of the volatile oil of assafœtida in the spirit of ammonia. —*Pilulæ Galbani comp.*, D. L. (Assafœtida, ʒss.; myrrh and sagapenum, of each, ʒiss.; galbanum, ʒj.; treacle (syrup. L.), a sufficiency.) — *Pilulæ Assafœtidæ*, E. (Assafœtida, galbanum, and myrrh, of each, three parts; conserve of red roses, four parts, or a sufficiency.) Dose, gr. x. to ℈j.—*Pilulæ fœtidæ*, Den. (As-

safœtida and castor, of each, 9 parts; camphor, 3 parts; Dippel's animal oil, 1 part; tincture of myrrh, a sufficiency.) Dose, gr. vj. to gr. xij. *Enema fœtidum*, D. E. (Add two drachms of tincture of assafœtida to the *enema catharticum*.)—*Emplastrum Assafœtidæ*, E. (Litharge plaster and assafœtida, of each, ʒij.; galbanum and bees' wax, of each, ʒi.; liquefy the gum resins together, and strain them, then add the plaster and wax also, in the melted state, and mix all thoroughly.) Applied externally in hysteria, flatulence, and hoopingcough.

Castoreum, D. L. E. *A peculiar secretion from the præputial follicles of Castor fiber; Castor.* The beaver, an inhabitant of the northern parts of Europe, and of North America, is placed by Cuvier in the class *Mammalia*, order *Rodentia*. Both the male and female beavers are furnished with castor sacs. In the living animal the secretion contained in them is fluid, but when removed from the animal it rapidly concretes.

P. P.—As met with in commerce, North American castor (the only kind now imported into Britain) consists of the two sacs united together by a kind of natural ligament; they are wrinkled; of a reddish-brown colour externally, paler internally; breaking with a somewhat resinous fracture; sometimes quite hollow in the centre. They have a strong, peculiar, disagreeable odour, and a somewhat aromatic, bitter taste.

C. P.—It contains volatile oil, resin, albumen, a peculiar principle discovered by Brandes and named by him *Castorine*, and to which he says it owes its properties, fatty matter, mucus, carbonate of ammonia, and salts of soda and potash. Castor yields its active principles almost entirely to alcohol.

Th. E.—Formerly in high esteem as an antispasmodic, but nearly fallen into disuse, its employment being restricted to some of the milder forms of hysteria, in which any benefit it produces is owing to its nauseous smell and taste.

D. & M. of Adm.—In substance from ʒi. to ʒij.—*Tinctura Castorei*, D. L. E. (Castor, powdered (bruised, E.), ʒij. (ʒiiss., L. E.); proof spirit, *by measure*, ℔ij. (rectified spirit, Oij., L. E.); macerate for seven (fourteen, L.) days, and strain; "may also be prepared by percolation," E.) Dose, fʒij. to fʒiv.—*Tinctura Castorei comp.*, E. (Castor bruised, ʒiiss.; assafœtida in small fragments, ʒx.; spirit of ammonia, Oij.; digest in a well-closed vessel for seven days, strain, and express strongly the residuum, and filter.) Dose, fʒi. to fʒij.—*Antispasmodic pills*, Paris H. (Castor, gr. vj.; valerian, gr. xxx.; oxyde of zinc, gr. xx.; sirup, q. s. for iij. pills.) No., 3 a day.

Fuligo ligni, *wood soot*, formerly contained in the British Pharmacopœias, is still much used on the Continent, and, within the last few years, has been employed, with excellent effect, as an antispasmodic, by some eminent physicians in Dublin. It has been found most beneficial in the latter stages of hoopingcough in children,

and in some forms of hysteria. It is prepared by burning wood under a small flue, and collecting the soot which is deposited in the chimney. It consists of a peculiar extractive matter called *pyretin*, some acetic acid, acetates of soda, potash, magnesia, and ammonia, creasote, &c. It yields its active properties partly to water, but more completely to alcohol. The preparations of soot that have been employed are as follows: *Decoctum Fuliginis* (wood soot, ʒiv.; boiling water, Oiss.; boil down to Oj. and strain). Only used as an external application to chronic eruptions of the scalp, and to obstinate ulcers.—*Tinctura Fuliginis* (wood soot, ʒij.; assafœtida, ʒi.; proof spirit, ʒxxxij.; digest for three days and strain). Dose, fʒj. to fʒij.—*Spiritus Fuliginis* (wood soot, one part; proof spirit, five parts; water, fifteen parts; distil four parts). Dose, min. xx. to min. xxx.

Galbanum, D. L. E.—*Concrete gummy resinous exudation of an unascertained plant (probably of a species of Opöidia*, E.—*of Bubon Galbanum*, D.—*of Galbanum officinale*, L.). It is imported from India, and from the Levant.

P. P.—It occurs in both tears and in lump; the tears are globular, irregular, about the size of a pea, usually agglutinated into masses of a pale greenish-yellow colour, somewhat translucent, having a strong peculiar odour, and an acrid, disagreeable, bitter taste; the lump variety is of a darker colour, rather opaque, with a less powerful odour and taste; when exposed to cold, both kinds become brittle, and may be readily reduced to powder.

C. P.—Galbanum consists chiefly of resin and gum, with a small proportion of volatile oil, and some bassorine. It is nearly entirely soluble in proof spirit, and partially so in rectified spirit and in ether; it forms an emulsion with water, and is rendered softer, but not melted by heat.

Th. E.—Galbanum is employed in the same cases as assafœtida, with which it is generally combined, being less energetic than that substance. It is more frequently employed externally, as a stimulating antispasmodic, in consequence of its consistence being better suited for plasters.

D. & M. of Adm.—In substance, either in pill or emulsion, gr. x. to gr. xx.—*Tinctura Galbani*, D. (Galbanum, in small fragments, ʒij.; proof spirit, *by measure*, ℔ij.; digest for seven days and filter.) Dose fʒi. to fʒij.—*Emplastrum Galbani*, D. (Litharge plaster, ℔ij.; galbanum, ℔ss.; yellow wax, ʒiv.; add the litharge plaster and the wax to the melted galbanum, and then melt all together with a medium heat.)—L. (Galbanum, ʒviij.; lead plaster, ℔iij.; common turpentine, ʒx.; resin of the spruce fir powdered, ʒiij.; add first the resin, then the plaster melted with a slow fire to the galbanum and turpentine melted together, and mix them all.) Applied externally, spread on leather.

Moschus, D. L. E.—*Inspissated secretion from the præputial follicles of Moschus moschiferus; Musk.* The musk deer, an inhab-

itant of the mountains of Eastern Asia, especially frequenting the steppes of the Altai, the banks of the River Irtysch, Mongolia, Thibet, and Butan, as far as Tonquin, is placed by Cuvier in the class *Mammalia*, order *Ruminantia*. In the male animal, immediately in front of the præputial orifice, is situated a small sac, filled with a viscid fluid, which, in the dry state, constitutes musk.

P. P.—The musk-bag, or, as it is commonly called, musk-pod, is somewhat oval, about $2\frac{1}{2}$ inches long, and $1\frac{3}{4}$ inches broad, smooth and bare on one side, somewhat convex, and covered with stiff, brownish-yellow hairs on the other, containing from ʒiss. to ʒiij. of musk. Musk is in the form of small unctuous grains, of a deep reddish-brown colour, mixed with whitish hairs; it has a strong, peculiar, diffusible, very persistent odour, and a bitter, aromatic taste.

C. P.—Musk consists of ammonia, stearine, elaine, cholesterine, acid oil combined with ammonia, volatile oil, an undetermined acid, gelatin, albumen, fibrine, carbonaceous matter, and numerous salts (*Guibourt and Blondeau*). It yields its active principles partially to water, but more completely to alcohol.

Adulterations.—Grain musk is usually adulterated; dried bullocks' blood is employed for this purpose; it may be detected by adding to an infusion of the suspected drug solution of corrosive sublimate; if it be genuine, it will not precipitate. Spurious musk-bags are said not to be uncommon in commerce.

Th. E.—Musk is not much prescribed now, in consequence of its high price; it is, nevertheless, a stimulating antispasmodic of great power, and is administered with excellent effect in hysteria, in chorea, and in the subsultus tendinum and hiccough of fevers and other diseases assuming a typhoid type. In cases of hysteria of long standing, so nearly allied to epilepsy as to be scarcely distinguishable from it, I have obtained very beneficial results from the employment of musk.

D. & M. of Adm.—In substance, gr. x. to gr. xx.—*Mistura Moschi*, L. (Musk, gum-arabic, sugar, of each, ʒiij.; rose-water, Oj.; rub the musk with the sugar, then with the gum, the rose-water being gradually poured in.) Dose, fʒi. to fʒij.—*Tinctura Moschi*, D. (Musk, in powder, ʒij.; rectified spirit, *by measure*, ℔j.; macerate for seven days, and filter.) Too weak for medical use.—*Pulvis Moschi comp.*, R. (Musk, 8 parts; valerian, 10 parts; camphor, 3 parts, mix.) Dose, gr. x. to gr. xx.—*Musk pills*, Paris H. (Musk, 2 parts; oxyde of zinc, 1 part; sirup, q. s.) Dose, gr. v. to gr. viij.—*Antihysteric pills*, Paris H. (Musk, extract of valerian, of each, ℈j.; extract of opium, gr. xij.; divide into 12 pills.) Dose, No. 2–3.

Opoponax, D. L. *Gum-resin of Opoponax chironium*, L; *of Pastinaca Opoponax*, D. This plant is a native of the South of Europe. It belongs to the class and order *Pentandria Digynia*, and to the natural family *Umbelliferæ*. Opoponax is obtained by incisions into the root; it occurs in reddish-yellow tears, possessing

a somewhat fetid but faint odour, with a bitterish, acrid taste; it consists chiefly of gum and resin, with a small quantity of volatile oil, starch, and extractive matter. This substance is quite obsolete in medical practice; it was formerly employed in the same cases as assafœtida and galbanum, which it resembles in its physiological properties.

Ruta, L. E. Ruta graveolens, folia, D. *Rue; leaves* (*and unripe fruit*, E.) *of Ruta graveolens.*—A native of the South of Europe, cultivated in our gardens. It belongs to the natural family *Rutaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A small branching shrub, with glaucous, bluish-green leaves, and yellow flowers in umbellate racemes.

P. & C. P.—Although the leaves only are ordered by the Dublin and London Colleges, the entire plant is met with in the shops. It has a strong, disagreeable, somewhat aromatic odour in the fresh state, much of which is lost in drying, and a bitter, acrid, unpleasant taste. Its medicinal properties depend on volatile oil and bitter extractive; the former, *Oleum Rutæ*, is officinal in the Dub. & Edin. Phar.; it is obtained by distilling the fresh herb with water. Oil of Rue is of a rich yellow colour, becoming darker by age; it has the peculiar odour of the plant in a marked degree, and a bitter, acrid, warm taste; its sp. gr. is 0·911. Rue yields its active properties to boiling water, but by decoction the volatile oil is dissipated.

Th. E.—Rue is a stimulating antispasmodic of some power, although not much employed in the present day. It has been administered with benefit in the spasmodic colic and general convulsions of children; and, in the hands of some practitioners, is said to have proved useful in hysteria and idiopathic epilepsy.

D. & M. of Adm.—Preparations of the fresh herb should always be employed, as the infusion (prepared by infusing ʒi. of the herb in Oj. of boiling water, in a covered vessel, for an hour) or the oil; the dose of the former is fʒi. to fʒij.; of the latter, min. ij. to min. v., in some agreeable sirup.—*Extractum Rutæ*, D. (Prepared as the simpler extracts.) A useless preparation, the volatile oil being dissipated in the process. Dose, gr. x. to gr. xx.—*Conserva Rutæ*, D. *Confectio Rutæ*, L. (Rue (dried, L.), caraway, bay berries, of each, ʒiss.; sagapenum, ʒss.; black pepper, ʒij.; despumated honey, ʒxvj. "Rub together to a very fine powder, and having added the honey, mix all well," D. "Rub the dry ingredients together to a very fine powder, and preserve them; then, whenever the confection is to be used, add the honey to them, and mix them all," L.) Only used in enemas, in the spasmodic affections of infants and children. From ℈j. to ʒj. is added to fʒvj. or fʒviij. of thin gruel.

Sagapenum, D. L. *Gum-resin, obtained from an unascertained plant* (*species of Ferula*, Lond.). Imported from the Levant.

P. P.—It occurs in semi-translucent masses of a dark brownish-

yellow colour, consisting of numerous tears agglutinated together; it has a fetid odour, weaker than assafœtida, and a hot, acrid taste; it breaks with a horny fracture.

C. P.—According to the analysis of Pelletier, sagapenum consists of gum, resin, volatile oil, bassorin, and some salts.

Th. E.—Sagapenum produces effects precisely similar to, but weaker than assafœtida; it is, consequently, scarcely ever employed now.

D. & M. of Adm.—In substance, given in the form of pill, gr. v. to gr. xx.—*Pilulæ Sagapeni comp.*, L. (Sagapenum, ʒj.; aloes, ʒss.; sirup of ginger, q. s.; beat together until they are incorporated.) Dose, gr. v. to gr. xx. A useful purgative and antispasmodic in the flatulent colic of dyspepsia.

Succinum, D. L. *Amber.*—An oil (*Oleum Succini*), and an acid (*Acidum Succinicum*), are still retained in the Dublin, and the oil in the London Pharmacopœia, but, although once highly esteemed in medicine as antispasmodics, they really possess such feeble medicinal properties, and are so little employed in the present day, that we may very well omit any account of them here.

Valeriana, D. L. E. *Root of Valeriana officinalis.*—An indigenous plant, belonging to the class *Triandria*, order *Monogynia*, in the Linnæan arrangement, and to the natural family *Valerianaceæ.*

B. C.—The root is tuberous, perennial, sending up a smooth, erect, furrowed stem, from two to four feet high, which produces rose-coloured flowers in a somewhat panicled corymb.

P. P.—The root, which should be dug up in autumn when the leaves have decayed, or in spring before the stem rises, consists of a short tuberous root-stock, and numerous root-fibres from two to six inches long, yellowish brown externally, whitish internally, of a strong, penetrating, characteristic odour, and a bitter, acrid, somewhat aromatic taste. Cats are remarkably fond of the odour. The roots of those plants which grow on the banks of rivers are useless.

C. P.—It consists of woody fibre, resinous extractive, gummy extractive, resin, and a little more than one per cent. of volatile oil; a peculiar acid has also been recently discovered to exist in it, which has been named *valerianic acid.* Valerian imparts its properties to both water and rectified spirit. Magnesia combined with valerian completely removes its odour, which may be again restored by the addition of sulphuric acid.

Th. E.—Medical practitioners differ much in opinion as to the powers of this substance, it being generally regarded as a medicine of little virtue. In several cases of epilepsy and of hysteri in which I employed it, I have found it decidedly beneficial; however, I have at the same time remarked that, by repetition, even though the dose be increased, it soon loses its antispasmodic powers.

D. & M. of Adm.—In powder, ʒss. to ʒj.—*Infusum Valerianæ*, D. L. (Valerian, ʒij. (ʒss., L); boiling (distilled, L.) water, fʒvij.

(Oj., L.); digest for an hour (half an hour, L.), and strain.) Dose, f℥j. to f℥ij.—*Tinctura Valerianæ*, D. (Valerian, in powder, ℥iv.; proof spirit, *by measure*, ℔ij.; macerate for seven days, and filter.) L. E. (Valerian bruised, ℥v.; proof spirit, Oij.; macerate for fourteen (seven, E.) days, and strain; "or prepare by percolation," *Edin.*) Dose, f℥ij. to f℥iv.—*Tinctura Valerianæ Ammoniata*, D. (Valerian, in powder, ℥ij.; spirit of ammonia, *by measure*, ℔j.; macerate for seven days, and filter.) L. E. (Valerian bruised, ℥v. (aromatic, L.); spirit of annonia, Oij.; macerate for fourteen days (seven, E.), and strain; "or prepare by percolation," *Edin.*) Dose, f℥j. to f℥ij.

CHAPTER IV.

ASTRINGENTS.

(Styptics—Desiccants—Constringents.)

Astringents may be defined, substances which produce contraction and condensation when they come in contact with living matter. The more immediate effect of astringents is to diminish secretion and excretion; ultimately they exert a tonic influence on the human body. Hence, then, they appear to be very nearly allied to *tonics;* indeed, in many instances the most powerful tonics will be obtained from the division astringents. Much difference of opinion exists as to the *modus operandi* of this class of remedial agents. Since the time of Cullen, this has been generally explained by a reference to their action in *tanning;* for the same substances which, by a peculiar chemical action, harden and condense dead animal matter, operate as astringents on the living system. This hypothesis may, to a certain extent, hold good as to the local action of astringents when applied to a morbidly secreting surface; that is to say, they act by constringing the extreme vessels of the part. But this will not account for their power in checking discharges from remote parts, when they are introduced into the system through the digestive organs; in the latter case, we must suppose that they produce some peculiar change in the living principle of the structure generally, which is incompatible with excessive secretion or discharge. In cases where the use of astringents is indicated, it will be always necessary, in the first instance, to ascertain the cause by which the morbid discharge is produced, as it often arises in diametrically opposite states of the system, and therefore very different remedies will, in different cases, assume the character of an astringent. Thus, where irritability exists, opium, taken from the division narcotics, will often prove our most useful remedy, given either alone or as an adjuvant to some more immediate astringent. If a state of plethora of the vascular system exist, bleeding and other depletory measures will be indicated

or if the discharge, as in some forms of diarrhœa, be caused by acrid or acid matter, emollients or demulcents, and antacids must be employed.

[Many of the articles relied on for internal exhibition as astringents, and especially useful in controlling hœmorrhage, are dependant for their utility, not upon their astringent powers upon the stomach, sympathetically transferred to the remote seat of the hœmorrhage, but upon their nauseating properties, thus retarding the general circulation, and diminishing both the force and frequency of the pulse. It is to this that dry salt, or salt and water, owes its reputation as a popular remedy in hæmoptysis, and not to any fanciful astringent action.]

ACETUM, L. ACETUM VINI, D. ACETUM GALLICUM ET BRITANNICUM, E. *Vinegar prepared by fermentation* (Lond.). *Wine vinegar* (Dub.). *French or British vinegar* (Edin.).

P. P.—Vinegar is of a pale reddish-yellow colour, transparent; with a sharp, peculiar odour (*acetous*), and an acidulous, refreshing taste. Sp. gr. from 1·006 to 1·019. French, or wine vinegar, is generally of a deeper colour, and has a more fragrant odour than British, or malt vinegar; its density also is greater, being from 1·014 to 1·022.

C. P.—It is composed of acetic acid, colouring matter, mucilage and water, and a trace of alcohol; British vinegar also contains sulphuric acid, manufacturers being allowed by law to add a thousandth part by weight of that acid; wine vinegar may be distinguished from malt vinegar by "ammonia in excess, causing a purplish muddiness, and slowly a purplish precipitate with it" (*Ed. Ph.*); in addition to the constituents mentioned above, it generally contains some bitartrate and sulphate of potash. The odorous principle of vinegar is conjectured to be acetic ether. Its medicinal virtues depend on the acetic acid it contains.

PREP.—Vinegar is an article of the Materia Medica in the three British Pharmacopœias. In France it is prepared from the lighter wines, by exposing them to the air in large wooden vessels placed in a room, the temperature of which is raised to between 68° and 80° F. In Britain, various kinds of malt liquor, cider, raw sugar dissolved in water, &c., are substituted for wine. Of late years, a greatly-improved process has been introduced in Germany, by which vinegar may be made in thirty-six hours: Strong alcohol is diluted with five or six parts of water, and about a thousandth part of yeast, honey, or impure vinegar added to it; the mixture is heated to 75° or 80°, and made to trickle slowly through a mass of beechwood shavings, contained in a tall cask, narrowed at the bottom, and pierced with small holes at the top and lower part, to allow a circulation of air: as soon as the mixture is passed through the barrel three or four times, it is converted into vinegar; the change being effected by the alcohol absorbing oxygen from the atmospheric air, the process taking place very rapidly, owing to the great surface of the liquid which is exposed.

Adulterations.—Vinegar varies much in strength, and also frequently contains many impurities. The density, as first shown by *Mollerat*, does not indicate accurately the quantity of acetic acid present; this is more correctly ascertained by its neutralizing power over crystallized carbonate of soda, 144 grains of the salt being equal to 51 grains of real acetic acid. The strongest vinegar pre-

pared, which is termed *proof vinegar*, is estimated to contain five per cent. of real acid. In the application of this test, however, care must be taken to allow for any sulphuric acid present. The impurities most commonly met with in vinegar are metallic matter, generally copper or lead; some acrid vegetable substance, as capsicum, grains of paradise, &c., and sulphuric acid. If the colour be altered on the addition of sulphuretted hydrogen, it contains metallic matter: the presence of any acrid substance may be detected by the taste, the vinegar having been first neutralized with carbonate of soda; the quantity of sulphuric acid contained is indicated by the extent of the precipitate produced with solution of muriate or nitrate of baryta.

Th. E.—Vinegar is an excellent refrigerating astringent, and as such is employed with much benefit in the colliquative sweating and diarrhœa of hectic; taken largely diluted with water, as the usual drink of the patient, it will seldom fail to diminish the excessive discharges. As a local astringent, it is used to check hœmorrhage from the nose, from the uterus, from hœmorrhoidal tumours, and from ulcers; in intestinal hœmorrhage, enemas containing vinegar have been employed with much advantage, particularly when the bleeding proceeds from the large intestines. In relaxation of the uvula and tonsils, it forms an excellent addition to astringent gargles; and in chronic ophthalmia, diluted with water, it is beneficially employed as a collyrium. Finally, in poisoning with the alkalies, or alkaline carbonates, vinegar is one of the best antidotes that can be employed; but in poisoning with most other substances, for which at one time it was very generally used, its administration is in general productive of harm.

D. & M. of Adm.—f℥ij. to f℥ss. For an enema, f℥i. to f℥ij. As a drink in hectic, f℥iij., diluted with Oiss. of distilled water, may be taken in the course of the day.—*Acetum destillatum*, D. L. E. ("Wine vinegar, *by measure*, 10 parts; distil 8 parts, *by measure*, with a gentle heat in glass vessels, rejecting the first part which comes over. The specific gravity of this acid should be 1·005," D. "Take of vinegar, conj. j.; let the vinegar distil in a sand bath, from a glass retort into a glass receiver. Keep the Ovij. first distilled for use," L. "Take of vinegar (French by preference), 8 parts; distil over with a gentle heat, 7 parts; dilute the product, if necessary, with distilled water, till the density is 1·005," E.) This preparation is preferred to common vinegar for external use in lotions, eye-washes, &c.—*Oxymel*, D. L. ("Honey, *by weight*, ℔ij.; distilled vinegar, *by measure*, ℔j.; boil down with a gentle heat to the consistence of sirup, removing the scum," D. "Honey (clarified), ℔x.; acetic acid, Oiss.; mix the acid with the honey made hot," L.) An excellent addition to gargles.—*Acetic gargle*, P. (Vinegar, f℥ij.; honey of roses, ℥i.; barley-water, f℥iv.; mix.) An excellent gargle in relaxed sore throat.

Acidum sulphuricum venale, D. Acidum sulphuricum, L. E.

Commercial sulphuric acid (*specific gravity*, 1·850, D.; 1·845, L. E.); *Oil of Vitriol.*

P. P.—It is a heavy, oily-looking liquid, transparent, colourless when pure (the commercial acid generally has a brownish-yellow tinge), inodorous, with an intensely acid, burning taste; when much diluted with water, the taste is merely styptic.

C. P.—It is composed of one equivalent of sulphuric acid (SO^3) and one of water; it boils at 620°, and freezes at —29°. It has a great affinity for water, which it absorbs from the atmosphere; during its combination with water great heat is evolved; a mixture of 4 parts, by weight, of strong acid with one of water raises the temperature to near 300°. Sulphuric acid is one of the most powerful acids of chemistry, supplanting nearly all others from their combinations. It chars and destroys most animal and vegetable substances. Its best characteristic is the heavy white precipitate, insoluble in either acids or alkalies, which it produces with solution of the muriate or nitrate of baryta.

Prep.—The method of preparing sulphuric acid is described in all elementary works on chemistry. The Dublin and Edinburgh Colleges have given formulæ for purifying the acid, in order to obtain it free from the impurities usually met with in the commercial sort; it is then termed *Acidum Sulphuricum purum*: "Commercial sulphuric acid, ℔j.; put it into a retort of flint glass, attach a receiver of the same kind, and with the joinings left open, apply heat until a twelfth part shall have distilled over; this is to be rejected, as it contains water: having again applied heat, distil the residue to dryness. A few slips of platina put into the retort prevent the ebullition from becoming too violent: the specific gravity of the distilled acid should be 1·845. Let it be kept in well-closed vessels," D. "If commercial sulphuric acid contain nitrous acid, heat f℥viij. of it with between gr. x. and gr. xv. of sugar, at a temperature not quite sufficient to boil the acid, until the dark colour at first occasioned shall nearly, or altogether disappear. This process removes nitrous acid. Other impurities may be removed by distillation, which, on the small scale, is easily managed by boiling the acid with a few platinum chips, in a glass retort, by means of a sand-bath or gas-flame—rejecting the first half ounce," E.

Adulterations.—If the acid contain water, it will not be of the prescribed density. The impurities usually present in commercial sulphuric acid are sulphate of lead, nitrous acid, and oxyde of arsenic. Dilution with distilled water will precipitate the white sulphate of lead, if it be present; the smallest trace of nitrous acid will be detected by pouring gently over the specimen to be examined a solution of the protosulphate of iron; if nitrous acid be contained in it, a deep-red colour will be produced at the line of contact. The arsenic adulteration can be easily detected by adding the diluted acid to pure zinc in *Marsh's apparatus*, and proceeding as for that substance (see Arsenic); or by passing a stream of sulphuretted hydrogen through the dilute acid, when a yellow sulphuret of arsenic will be formed.

Th. E.—Sulphuric acid is a most powerful corrosive poison, destroying the animal tissues wherever it comes in contact with them. Properly diluted, it is an excellent tonic astringent, and is employed with very beneficial results in all forms of passive hœmorrhages, and to check excessive discharges, when they are dependant on debility. Thus, it is used with much advantage in hœmoptysis, in epistaxis, in slight but protracted bleedings from the

uterus, the stomach, or intestines, in purpura hœmorrhagica if very great debility be present, and in the colliquative sweating and diarrhœa of hectic. As a topical astringent, sulphuric acid largely diluted was at one time much used to foul and indolent ulcerations of the mouth and fauces, but in consequence of its liability to injure the teeth, it is scarcely ever employed in such cases at present. The internal use of this acid, if continued for any length of time, is apt to derange the digestive functions, causing cardialgia, griping pains, and emaciation.

D. & M. OF ADM.—*Acidum sulphuricum dilutum*, D. L. E. (Sulphuric acid (pure, D.), one part (f℥iss., L.; f℥j., E.); distilled water, 7 parts (f℥xivss., L.; f℥xiij., E.); add the acid to the water gradually, and mix. Sp. gr., 1·084, D.; 1·090, E.). Dose, min. x. to min. xxx. in f℥i. to f℥ij. of some mild liquid; it is usually given in the acid infusion of roses.—*Acidum sulphuricum aromaticum*, D. E. (Sulphuric acid (commercial, E.), *by weight*, ℥vj. (f℥iiiss., E.); rectified spirit, *by measure*, lbij. (Oiss., E.); add the acid gradually to the spirit, digest the mixture with a very gentle heat for three days in a close vessel; then add cinnamon bruised, ℥iss., and ginger bruised, ℥j.; digest for six days more, and "filter through paper placed in a glass funnel," D. "Strain; or the mixed powders may be moistened with a little of the acid spirit, and after 12 hours the powders may be exhausted by percolation with the rest of the spirit," E.) This preparation is used in the same cases as the dilute sulphuric acid, for which it forms an agreeable substitute. Dose, min. x to. min. xx. in a wine-glass of water.—*Unguentum acidi sulphurici*, D. (Sulphuric acid, ℥i.; prepared hog's lard, ℥i.; mix.) Not much employed at present; said to be useful in scabies.

INCOMP.—The alkalies, and their carbonates; most metals, and their oxydes; some of the earths, and their carbonates; acetate of lead; and chloride of calcium.

In poisoning with this acid, the best antidotes are the alkaline bicarbonates, or carbonate of magnesia. Chalk and magnesia, though generally recommended, should not be employed, as with the former sulphate of lime is formed, and the combination of sulphuric acid with the latter produces a considerable degree of heat. External parts burned with it should be washed with soap and water.

ALUMEN; ALUMINÆ ET POTASSÆ SULPHAS, D. L. ALUMEN, E. *Alum; sulphate of alumina and potash.*

P. P.—As met with in the shops, alum is in transparent, colourless, crystalline masses, void of odour, having a sweetish, astringent taste. Sp. gr., 1·700. By solution and crystallization, it may be readily obtained in regular octahedres.

C. P.—It is composed of one eq. of sulphate of potash, one of tersulphate of alumina, and 24 of water ($KO, SO^3 + Al^2 O^3, 3 SO^3 + 24 HO$). The crystals effloresce slightly in the air; heated, they fuse in their water of crystallization, all of which they part

with, and are converted into a light, porous mass, known as *dried* or *burned alum*. Alum dissolves in 18·4 parts of cold water, and in 0·75 parts of boiling water: the solution is decidedly acid. By a red heat alum is deprived of most of its sulphuric acid, and converted into a mixture of sulphate of potash and pure alumina.

This salt is not liable to adulteration.

Th. E.—Alum is a powerful astringent, and as such is employed with benefit in the treatment of many diseases, both as a general and topical remedy. Administered internally, it is found useful in the treatment of chronic diarrhœa and dysentery, in atonic mucous discharges, in passive hœmorrhages, in the colliquative sweating of hectic, &c. In *pyrosis*, given in large doses frequently repeated, it has proved very successful in the hands of many practitioners; and it has also been found to be an excellent remedy in the treatment of *colica pictonum*, given in full doses combined with opium. As a topical astringent, it is employed to arrest bleeding from minute vessels, as in epistaxis, in menorrhagia, in hœmorrhage from leech bites, &c.; *dried alum* in fine powder is an excellent application in the early stages of the inflammatory sore throat of scarlatina, measles, and smallpox, and in diphtheritis; it is best applied by insufflation, that is, by placing some of it in a glass tube, and blowing it into the throat. Dissolved in water, alum is also used with much advantage, as a gargle, in relaxation of the uvula and tonsils, in chronic ulcerations of the mouth and fauces, and in excessive salivation; as a collyrium, in chronic ophthalmia; and as an injection in gleet and fluor albus.

D. & M. of Adm.—*Internally*, gr. x. to ʒss. in powder, or made into pill with extract of liquorice, or it may be given in solution in some aromatic water.—*Pulvis aluminis comp.*, E. (Alum, ʒiv.; kino, ʒi.; mix them and reduce them to fine powder.) A useful astringent in chronic diarrhœa, and in passive hœmorrhages from the stomach and bowels; dose, gr. xij. to ℈ij. It has also been applied externally to flabby, ill-conditioned ulcers.—*Alum whey*. (Alum, powdered, gr. x.; new milk, fʒij.; boil together for ten minutes, and strain, to separate the curd.) Sufficient for one dose. *Externally*, gr. xxx. to ʒij. dissolved in Oi. of water.—*Cataplasma aluminis*, D. (Agitate together, so as to form a coagulum, the whites of two eggs and a drachm of alum.) In chronic or purulent ophthalmia, applied to the eye between two folds of linen.—*Alumen siccatum*, D.—*exsiccatum*, L. E. (Take any convenient quantity of alum; liquefy it in an earthen (or iron, E.) vessel over the fire, increase the heat till the ebullition has ceased; then reduce it to powder.) For external use only.—*Liquor aluminis comp.*, L. (Alum and sulphate of zinc, of each, ʒi.; boiling water, Oiij.; dissolve the salts together in the water, and strain.) An excellent astringent lotion, collyrium, or injection.

Incomp.—Alkalies and their carbonates; lime and magnesia, and their carbonates; tartrate of potash; acetate of lead; vegetable extractive matter; and substances containing tannin.

Catechu, D. L. E. *Catechu; Extract of the wood of Acacia Catechu*, D. L.—*Extract of the wood of Acacia Catechu: of the kernels of Areca Catechu, and of the leaves of Uncaria Gambir; probably, too, from other species*, E.—*Acacia Catechu* is a native of several parts of the East Indies; it belongs to the natural family *Leguminosæ*, and to the Linnæan class and order *Polygamia Monœcia*. *Areca Catechu* inhabits most of the Indian continent and islands; it belongs to the natural family *Palmaceæ*, and to the Linnæan class and order *Monœcia Hexandria*. *Uncaria Gambir* is a native of many of the islands of the Indian Archipelago; it is placed in the natural family *Cinchonaceæ*, and in the Linnæan class and order *Pentandria Monogynia*.

B. C.—*Acacia Catechu*; stem, 15–20 feet high, with a brown, scabrous bark, and a hard, heavy wood, dark-red in the centre; flowers numerous, pale-yellow; legumes, 8 seeded.—*Areca Catechu*; a beautiful palm between 40 and 50 feet high; leaves, 15 feet in length, crowded at the extremity of the stem; flowers in numerous clusters, appearing from among the leaves; fruit, a handsome orange-coloured ovoid drupe.—*Uncaria Gambir*; a stout scandent shrub; leaves ovato lanceolate; flowers green and pink, in loose heads, on opposite axillary peduncles.

Prep.—From the acacia, catechu is obtained by boiling the red heart-wood, cut into chips, for some hours in water, until the decoction is sufficiently concentrated to become, on cooling, a tough extract; it is then divided into small masses, and dried slowly in the shade. In the interior of the fruit of the *Catechu palm* is contained a roundish, conical nut, marbled internally brown with whitish veins, commonly known by the name of *betel nut*, and which, with lime and the leaves of the *Piper betel*, constitute the celebrated masticatory of the East, called *Betel*. These nuts contain a large quantity of tannin, and a decoction of them concentrated and dried forms some of the inferior catechus of commerce. The leaves of the *Uncaria gambir* are boiled in water immediately after they are pulled from the tree, the decoction concentrated, and run into square or parallelopiped moulds, to constitute the catechu in cubes of commerce.

P. P.—A great many varieties of catechu occur in commerce; but we shall confine our attention to the two sorts most usually met with in druggists' shops, the remainder being chiefly employed for tanning. 1st. *Brown Catechu in irregular masses.* This is the produce of the Acacia Catechu; it occurs in irregular masses, weighing from three or four ounces to a pound or more each, of a chocolate-brown colour, very friable, with an astringent, bitter taste. 2d. *Catechu in cubes* (*Gambeer*, *Terra Japonica*, *Cubical resinous Catechu*). This variety is obtained from the Uncaria Gambir; it occurs in cubes, whose faces are about an inch square; it is of a yellowish-brown colour, with a paler, dull, earthy fracture; is void of odour, but has a very astringent taste, becoming feebly sweetish.

C. P.—The different varieties of catechu consist principally of *tannin*, and a peculiar acid, which has been named *catechuic acid*. Their astringency depends on the tannin, of which the finer qualities contain 55 per cent., while some inferior specimens do not yield more than 28 per cent. Catechu does not dissolve completely in boiling water, but, when of good quality, is almost entirely soluble in alcohol. The watery infusion is of a dark reddish-brown colour, and reddens litmus paper faintly; it gives a blackish precipitate with sulphate of iron.

Adulterations.—The varieties of catechu are so numerous, so different in quality, and many of them so very impure, that the only satisfactory test of their relative value is to ascertain the quantity of tannin which is contained in them. This may be readily done by acting on a given weight with ether, evaporating the ethereal solution to dryness, treating the extract thus obtained with cold water, and again evaporating, when the proportion soluble in both ether and water should amount at least to from 38 to 40 per cent. of the specimen.

Th. E.—Catechu is a simple, but very efficacious astringent, and, consequently, is in general use. It may be administered in all cases of increased mucous discharges, where there is no inflammation present. Thus, it is employed with benefit in chronic cystirrhœa, in leucorrhœa, in gleet, in chronic catarrh, and in old-standing cases of diarrhœa and dysentery, in which it is usually given in combination with opiates. It is also an excellent remedy in passive hœmorrhages from the intestines or uterus; as a topical astringent, it is one of the most useful applications in relaxation of the uvula and tonsils, in slight ulcerations of the mouth, and in chaps or excoriations of the nipple in nurses; for the latter purpose, the tincture should be applied with a camel's-hair pencil repeatedly in the course of the day. Public speakers and singers employ catechu lozenges, with much benefit, as a preventive of hoarseness, and as a remedy for it when it exists.

D. & M. of Adm.—Gr. x. to ʒj. in powder with sugar, or made into a bolus with honey or treacle.—*Infusum Catechu*, E. *Infusum Catechu comp.*, D. L. (Extract of catechu (powdered, L.), ʒiiss. (ʒvi., L.); cinnamon, bruised, ℥ss. (ʒi., L.); boiling water (distilled, L.), ℔ss. (Oj., L.); digest (macerate, L.) for an hour in a covered vessel, and strain (through linen, D.), D. L.—"Catechu, powdered, ʒvj.; cinnamon powdered, ʒi.; sirup, f℥iij.; boiling water, f℥xvij.; infuse the catechu and cinnamon with the water for two hours, strain through linen or calico, and add the sirup," E.) Dose, f℥i. to f℥ij. two or three times a day, or the same quantity may be added to an astringent enema.—*Tinctura Catechu*, D. L. E. (Catechu (in moderately fine powder, E.), ℥iij. (℥iiiss., L. E.); cinnamon, bruised, ℥ij. (℥iiss., L. E.); proof spirit, *by measure*, ℔ij. (Oij., L. E.); macerate (digest, E.) for 7 (14, L.) days (strain and express strongly, E.), and filter. "This tincture may be also prepared by the process of percolation, the mixed powders being put into the percolator without being previously moistened with the spirit," E.) Dose, fʒi. to fʒij., usually employed as an adjunct to astringent mixtures in diarrhœa.—*Electuarium Catechu*, E. *Elect. Catechu comp.*, D. (Catechu, ℥iv.; cinnamon, ℥ij. (℥i., E.); kino, ℥iij. (℥iv., E.); (nutmeg, ℥i., E.); reduce these to powder, and add opium (Turkey, D.) diffused in a little sherry, ʒiss.; and sirup of ginger, boiled down to the consistence of honey, ℔ij$\frac{1}{2}$ (Oiss., E.); and beat them thoroughly to a uniform mass.) A useful astringent in chronic diarrhœa and dysentery. Dose, ℈i. to ʒij. One ounce (Dub.) contains gr. iiss. of opium.—*Catechu lozenges*, P. (Catechu,

1 part; sugar, 4 parts; mucilage of gum-tragacantn, sufficient to form into a proper mass; divide into lozenges of gr. xij. each.)

INCOMP.—The alkalies; salts of iron and of lead; gelatine; and all vegetable substances whose active principle is an alkaloid, as an insoluble tannate of the alkaloid will be formed; Christison, however, states that it is probable that the alkaloidal tannates are sufficiently soluble in the acids of the gastric juice.

CREASOTON, L. CREASOTUM, E.—*An oxyhydrocarburet, prepared from pyroxylic oil* (Lond.).—*Creasote* (Edin.). Creasote exists in pyroligneous acid, wood smoke, and in wood tar, from the latter of which it is usually prepared. Different processes are followed by different manufacturers for the preparation of creasote; and as they are very complicated, and can only be successfully executed on the large scale, I must refer to some of the modern works on chemistry for an account of them.

P. P.—Pure creasote is a colourless, transparent, oily-looking liquid, having a smoky odour, and a bitter, acrid, somewhat caustic taste. Its sp. gr. at 68° F. is 1·037 (Reichenbach); 1·066 (Edin. Phar.).

C. P.—It is a compound of $C^7H^{4\frac{1}{2}}O$. It boils at a temperature of 397·4, and is not congealed at —16·6°; at a temperature a little above its boiling point it is decomposed; it is inflammable, and burns with a very sooty flame. Creasote forms two different compounds with cold water: one, a solution of 1·25 parts of creasote in 100 parts of water; the other, a solution of 10 parts of water in 100 of creasote. It mixes with acetic acid in all proportions, as also with alcohol and ether. It coagulates albumen; and has a powerful preservative property with respect to animal substances, whence its name is derived (*κρεας σωζω*).

Adulterations.—Creasote, from being badly prepared, frequently contains a number of peculiar principles which exist in tar, and it is commonly adulterated with the fixed and volatile oils; its purity may be known by its being colourless, by its complete solubility in acetic acid, by its density not being too high, and "by its leaving no translucent stain on white filtering paper, when dropped on it, and exposed to a temperature of about 212° for ten minutes."—*Ed. Ph.*

TH. E.—As an astringent, creasote is only employed externally. Its principal uses are, as a styptic, to arrest hœmorrhage, which it does very effectually when the bleeding proceeds from small vessels, as in cuts or abrasions, from leech bites, or from ulcerated surfaces; and as an application to indolent ulcers, especially when accompanied with a sanious discharge, to chronic venereal or phagedenic ulceration, to ulcerated chilblains, and in chronic skin diseases, particularly those of the scalp. In the external application of creasote in the form of wash, its little solubility in water should be remembered, for if an excess be present it will float on the surface, and being thus directly applied, will produce an effect very different from what was intended. For a wash, min. ij. to min. vj.

may be dissolved in f℥i. of water; or the following ointment may be employed: *Unguentum Creasoti*, L. E. (Creasote, f℥ss. (f℥i., E.); axunge, ℥i. (℥iij., E.); "rub and mix them," L. "Melt the axunge, add the creasote, stir them briskly, and continue to do so as the mixture concretes on cooling," E.)

[Creasote is much used in the United States, not only as an astringent, but as a caustic, a gargle in ulcerations of the throat, and especially in certain diseases of the ear. For this latter purpose, one drachm is added to three drachms of oil of almonds, and introduced by a camel's-hair pencil in purulent discharges from the ear, attended with deafness. Or it may be diluted with twelve times its quantity of the oil, and then poured into the ear. It has acquired a merited popularity by its success in these cases.]

Creta, *Chalk* (described in the division Antacids), is employed as an astringent in the various forms of diarrhœa; its beneficial effects, however, depend on its antacid properties (see p. 29). Chalk mixture is very generally used as a vehicle for more active astringents. The following preparation is admirably adapted for the simpler forms of diarrhœa unattended with inflammation: *Pulvis cretæ comp. cum opio*, D. L. *Pulvis cretæ opiatus*, E. (Compound chalk powder, ℥viss. (℥vj., E.); hard opium, powdered, ℈iv.; mix them.) Dose, for adults, gr. xx. to gr. xl.; for children, gr. ij. to gr. x. Forty grains (D. L.), thirty-seven (E.), of this powder contain one grain of opium.

Cupri sulphas, D. L. E. *Sulphate of copper. Blue vitriol.*

P. P.—This salt usually occurs in fragments of large crystals, of the oblique rhombic prism series, semitransparent; of a beautiful blue colour; without odour, but having a styptic, metallic taste. Sp. gr. 2·2.

C. P.—The crystals are composed of 1 eq. of protoxide of copper, 1 of sulphuric acid, and 5 of water ($CuO, SO^3, HO+4\,HO$). They effloresce slightly in dry air; at a temperature of 212°, they part with 4 eq. of water; at 400° they become anhydrous and white; and at a red heat they fuse and lose part of their acid. Sulphate of copper is soluble in 4 parts of cold, and in 2 of boiling water; it is insoluble in alcohol. It has an acid reaction.

Prep.—It is an article of the Materia Medica in the three British Pharmacopœias. On the large scale, it is usually prepared by roasting copper pyrites, *sulphuret of copper*, exposing it to the air and to moisture until it is oxydated, dissolving out the sulphate thus formed, evaporating and crystallizing.

Not liable to adulteration.

Th. E.—Sulphate of copper in large doses, if it be not rejected by vomiting, is a powerful irritant poison, producing inflammation of the parts with which it comes in contact, and acting remotely on the nervous system, causing death, with coma and convulsions. In small but repeated doses, it operates as a tonic and astringent; with the latter intention, it is employed alone in chronic diarrhœa and dysentery, in which it will often succeed in checking the dis-

charges, when vegetable astringents completely fail. Externally, a solution of sulphate of copper is used with benefit as a stimulating astringent to indolent and ill-conditioned ulcers accompanied with excessive discharge, as a collyrium in chronic ophthalmia, and as an injection in chronic mucous discharges from the urethra or vagina. In the early stages of gonorrhœa, if the inflammation does not run very high, a weak solution, gr. i. to f℥i. of water, injected three or four times a day, will often succeed in checking the disease.

D. & M. of Adm.—Gr. ss. to gr. ij. or gr. iij., made into pill with conserve of roses. For a lotion, gr. ij. to gr. x. in f℥i. of water. For an injection, gr. i. to gr. iv. to f℥i. of water.

Incomp.—The alkalies and their carbonates; acetate of lead; nitrate of silver; all the salts of iron except the sulphate; and most astringent vegetables.

In poisoning with this salt, the best antidote is albumen, as the whites of eggs; and in their absence, wheaten flour. Sugar has also been found beneficial, and iron filings have been recently proposed, so as to precipitate the copper in the metallic state.

Ferri pernitras. *Pernitrate of iron; Persesquinitrate of iron.*

P. P.—A transparent liquid, of a fine orange-brown colour, with a weak nitric acid odour, and an acid, styptic taste.

C. P.—From this solution, large transparent, colourless crystals may be procured; according to Pelouze, their composition is 2 atoms of peroxide of iron ($Fe^2 O^3$), 3 of nitric acid, and $1\frac{1}{2}$ of water. If kept in a bottle not quite filled, or by exposure to heat, the solution is decomposed, peroxide of iron thrown down, and nitrous acid is evolved; in which state it is unfit for medical use.

Prep.—Nitric acid and distilled water, of each, equal parts; clean iron cut into small fragments, a sufficiency; mix the acid with the water in a capacious glass vessel, and add the iron gradually, and in small quantities at a time, as long as any is dissolved. Preserve the solution in well-stoppered glass bottles.

Th. E.—Solution of the pernitrate of iron is an admirable astringent, possessing also tonic properties. It will be found particularly useful in chronic cases of mucous diarrhœa, where there is much emaciation and loss of appetite. In such cases I have derived much benefit from its employment, after many other remedies had failed. My friend Dr. Montgomery, of Dublin, informs me that he has used it extensively in the treatment of mucous discharges from the vagina, and that, in such cases, he considers it the best of the ferruginous preparations.

D. & M. of Adm.—Min. xx. to min. xxx. for adults; min. v. to min. xv. for children. It is best administered in water, sweetened with *simple* sirup.

Incomp.—All astringent vegetable infusions, decoctions, or sirups.

Ferri sulphas, D. L. E. *Sulphate of protoxyde of iron; Green vitriol.*

P. P.—Commonly met with in large transparent, pale, bluish-green crystals, the primary form of which is the oblique rhombic

prism. They are inodorous, but have an acid, disagreeable, styptic taste. Sp. gr., 1·82.

C. P.—The crystals are composed of 1 eq. of protoxide of iron, 1 of sulphuric acid, and 7 of water (Fe O, SO^3, HO+6 HO). They effloresce slightly in dry air, but if moisture be present, they attract oxygen, and become covered with a brownish-yellow crust of the sesquioxyde of iron. Heated, it fuses in its water of crystallization, 6 eq. of which it parts with at a temperature of 238° ; at a red heat it is decomposed, the sulphuric acid driven off, and the red peroxyde, *colcothar*, left. Sulphate of iron requires for its solution once and a half its weight of cold water, and a third of its weight of boiling water. It is insoluble in alcohol. The solution reddens litmus paper.

Prep.—*Dub.* "Iron filings, 4 parts ; sulphuric acid, 7 parts ; water, 60 parts; dissolve the metal with the aid of heat, and filter the liquor through paper. Then, after due evaporation, set aside, that crystals may form by slow cooling." *Lond.* "Iron filings, ʒviij. ; sulphuric acid, ʒxiv. ; water, Oiv. ; mix the acid with the water, and add the iron ; then apply heat, and when bubbles have ceased to escape, strain the liquor, and set it aside, that crystals may be formed ; evaporate the liquor poured off, that it may again yield crystals. Dry them all." An article of the Materia Medica in the Edinburgh Pharmacopœia.

Adulterations.—The presence of the sesquioxyde, which is very common in the commercial salt, is known by the yellowish-brown colour of the crystals. It often is contaminated with copper, which may be readily detected by immersing a polished plate of iron in a solution of the salt, on which the copper will be deposited, if any be present.

Th. E.—Sulphate of iron, taken in small doses frequently repeated, acts as a tonic and astringent ; with the latter intention it is employed in passive hœmorrhages, in chronic diarrhœa and dysentery, and in atonic mucous discharges. As a topical remedy, it is used to check bleeding from many small vessels, and in solution as an astringent lotion or injection, to ulcers, in chronic ophthalmia, and in chronic discharges from mucous membranes, as in leucorrhœa and gleet.

D. & M. of Adm.—Gr. j. to gr. v., in pill.—*Ferri sulphas exsiccatus*, E. (Expose sulphate of iron to a moderate heat in an unglazed earthen vessel till it becomes white and perfectly dry.) A more convenient preparation for internal use than the crystallized salt ; three grains are equal to nearly five of the crystals. Dose, gr. ss. to gr. iij.—*Pilulæ sulphatis ferri*, E. (Dried sulphate of iron, 2 parts ; extract of taraxacum, 5 parts ; liquorice-root powder, 3 parts ; conserve of roses, 5 parts ; beat them together into a proper mass, which is to be divided into five-grain pills.) Each pill contains $\frac{5}{6}$ of a grain of dried sulphate of iron. Dose, one to three pills. For external use, gr. ij. to gr. x. may be dissolved in fʒi. of water.

Incomp.—The alkalies, and their carbonates ; nitric acid ; lime-water ; nitrate and tartrate of potash ; iodide of potassium ; borax ; muriate and nitrate of baryta ; acetate of lead ; the soaps ; and all vegetable astringents.

Gallæ, D. L. E. *Galls ; gall-nuts ; Excrescences* (*diseased*

buds, L.) *of Quercus infectoria*.—This tree is a native of Asia Minor; it belongs to the natural family *Cupuliferæ*, and to the Linnæan class and order *Monœcia Polyandria*. Galls are formed on the young branches, in consequence of the irritation produced by the puncture of a hymenopterous insect, the *Diplolepis Gallæ tinctorum*, which punctures the bark for the deposition of its eggs.

P. P.—Galls vary in size from that of a large pea to that of a cobnut. They are of a grayish-green colour, tuberculated on the surface, the tubercles and intervening spaces smooth; hollow, and of a yellowish-white colour internally. They have an intensely-astringent taste, but no odour. Galls are imported principally from Constantinople and Smyrna, but some are brought from the East Indies. In commerce, two kinds of galls are commonly met with, blue or green galls, and white galls: the former are gathered before the escape of the insect, and are the best; the latter are perforated with a small circular hole, through which the insect has escaped, are larger, of a paler colour, but are much inferior in astringency.

C. P.—Galls are composed of about 26 per cent. of tannin, with a trace of gallic acid, extractive matter, a compound of pectic acid and tannin insoluble in cold water, tannates and gallates of potash and of lime (*Berzelius*). They yield their astringent property to water, proof-spirit, alcohol, and ether. Of these, water is the best solvent; the solution gives a curdy precipitate with solution of gelatine (*tannate of gelatine*, the basis of leather), and a bluish-black precipitate with salts of the sesquioxyde of iron (*tanno-gallate of iron*, the basis of ink).

Galls are not liable to adulteration in English trade.

Th. E.—Galls are among the most powerful vegetable astringents we possess; nevertheless, they are but seldom employed internally; in medicine they may be used in passive hœmorrhages, in chronic diarrhœa or dysentery, in gleet, and in leucorrhœa. They are the best antidote in poisoning, with tartar emetic, ipecacuanha, emetina, and the vegetable alkaloids generally. Externally, galls are employed as topical astringents in the milder forms of hœmorrhoids, in relaxation of the uvula and tonsils, in chronic ulcerations of the mouth and fauces, and in atonic mucous discharges.

D. & M. of Adm.—*Internally*, in powder, gr. v. to ℈j.—*Infusum Gallæ*. (Galls, powdered, ʒiv.; boiling water, fℨvj.) Dose, fℨss. to fℨij.—*Tinctura Gallarum*, D. E. *Tinctura Gallæ*, L. (Powdered galls, ℨiv. (℥v., L.; ℨij., E.); proof-spirit, *by measure*, ℔ij. (Oij., L.; Oj., E.); macerate for seven (fourteen, L.) days, and filter; "or may be prepared by percolation, as tincture of capsicum," E.) Dose, fʒss. to fʒij. *Externally*, ʒij. infused in Oj. of water, for a gargle, lotion, or injection.—*Unguentum Gallarum*, D. (Galls, in fine powder, ℨj.; lard, ℨviij.; mix.—*Unguentum Gallæ compositum*, L. E. (Galls, finely powdered, ʒij.; hard opium, in powder, ʒss. (ʒi., E.); lard, ℨij. (ℨj., E.); triturate well together.) The opium in the L. and E. formulæ is an excellent addition to this ointment; a drachm of camphor is also often added with benefit.

INCOMP.—The mineral acids; salts of iron and lead; sulphate of copper; nitrate of silver; carbonate of potash; lime-water; tartar emetic; and infusions of cinchona, calumba, cusparia, ipecacuanha, opium, &c.

GEUM URBANUM, RADIX, D. *Root of Geum Urbanum, or Common Avens.*—Indigenous; belonging to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia.*

B. C.—Root of many brown fibres; stem, 6–18 inches high, herbaceous; leaves green, hairy; flowers yellow, terminal, solitary.

P. U. & M. of PREP.—The root; it should be dug up in spring, and dried with a moderate heat.

P. P.—Geum root consists of numerous small fibres, proceeding from a root-stalk about two or three inches in length; it is dark-brown externally, reddish internally; has an aromatic, clove-like odour in the recent state, which is lost by drying; its taste is aromatic and astringent.

C. P.—The principal constituents of the root are tannin, resin, and a trace of volatile oil.

TH. E.—As an astringent, this root was formerly much employed in various diseases, and still bears a high character in many parts of the Continent; in Ireland, though retained in the Dublin Pharmacopœia, it is only used as a domestic remedy.

D. & M. OF ADM.—In powder, 3ss. to 3i. *Decoctum Gei radicis.* (Geum root, bruised, ℥i.; boiling water, Oi.; boil down to f℥xij.). Dose, f℥ss. to f℥i.

INCOMP.—All substances incompatible with tannin.

HÆMATOXYLON, E. HÆMATOXYLUM, L. HÆMATOXYLUM CAMPECHIANUM, LIGNUM, D. *Logwood; Wood of Hæmatoxylum Campechianum.*—A native of Campeachy in Central America, now naturalized in Jamaica. It belongs to the natural family *Leguminosæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—Stem crooked, about 8 inches in diameter, and 40 or 50 feet high; leaves large, pinnate; flowers yellow, in racemes.

P. P.—The heart-wood of the tree, which is of a dark-red colour, is alone employed, the bark and alburnum being chipped off. It is imported in billets, which are dense and hard, have a weak, agreeable odour, and a sweetish, astringent taste.

C. P.—Logwood contains a peculiar red, crystalline, bitter principle, which has been named *hæmatin*, or *hæmatoxylin*, resin, volatile oil, some tannin, acetic acid, and various salts. *Hæmatin* is often found in the fissures of the wood, in beautiful, large, red crystals. Logwood yields its active principles to both water and alcohol; the solutions are of a fine purple colour, which is changed to violet by the alkalies; with alum, or acetate of lead, a blue precipitate is produced; a dark brown, with the salts of iron; and a reddish with gelatine.

Adulterations.—Various red-coloured woods are substituted for logwood, from which they may be readily distinguished by not possessing the same agreeable odour.

Th. E.—Logwood is an excellent astringent in chronic diarrhœa and dysentery, for which it is peculiarly adapted, as, although it checks the excessive discharge, it does not produce constipation. It has also been used in the profuse sweating of phthisis, and in diabetes.

D. & M. of Adm.—*Decoctum Hæmatoxyli*, D. E. (Logwood, in fine chips, ʒiss. (ʒi., E.); cinnamon, bruised (powdered, E.), ʒj.; water, *by measure*, ℔ij. (Oi., E.). Boil the logwood in the water down to one half, adding the cinnamon towards the close; and strain.) Dose, fʒi. to fʒij. *Extractum Hæmatoxyli*, D. L. E. ("Prepared as the simpler extracts," D. "Logwood, powdered (in chips, E.), ℔iiss. (℔j., E.); boiling water (distilled, L.), cong. ij. (cong. i., E.); macerate for 24 hours, then boil down to cong. j. (Oiv., E.), strain while hot, and evaporate in the water-bath (vapour-bath, E.) to a proper consistence.) Not much used; it becomes so hard by keeping, that pills made of it pass through the bowels unchanged. Dose, gr. x. to gr. xxx.

Incomp.—The mineral acids; acetic acid; lime-water; sulphates, and acetates.

Kino, D. L. E. *Kino; Extract of Pterocarpus erinaceus*, L. *Concrete exudation of Pterocarpus erinaceus, and of other undetermined genera and species*, E.—African kino (which I believe to be the variety usually met with in British commerce) is obtained from the Pterocarpus erinaceus, a native of Gambia and Senegal; belonging to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Decandria*. East India Kino, which, according to Pereira, is always regarded in commerce as *genuine gum Kino*, is the extract of a plant not yet positively ascertained, probably another species of the genus Pterocarpus. Botany Bay Kino, also sometimes met with, is the inspissated juice of the Eucalyptus resinefera, a native of Australia and Van Dieman's Land; belonging to the natural family *Myrtaceæ*.

Prep.—African Kino is procured from incisions made into the trunk and branches of the tree, whence the juice exudes, and gradually concretes into brittle tears. Botany Bay Kino is obtained in a similar manner. East Indian Kino is said to be procured by boiling down the leaves and young branches, and thus forming an extract.

P. P.—Kino occurs in the form of small angular fragments or tears, none of them larger than a pea, opaque, glistening, and of a reddish-black colour. They are very brittle; when chewed they adhere to the teeth, and give the saliva a blood-red colour. They are void of odour, but have an intensely astringent taste.

C. P.—Kino is composed of 74 per cent. of tannin and a peculiar extractive containing catechuic acid, 24 of red gum, and 1 of insoluble matter. It is only very partially soluble in cold or boiling water; but alcohol dissolves nearly two thirds of it, and is therefore the best menstruum for its administration in medicine.

Adulterations.—Other astringent substances, which bear a general resemblance to kino, but are of inferior quality, are frequent-

ly substituted for it in commerce; none of them, however, have the same glistening, reddish-black colour, which is so well seen in the smaller fragments of kino; the sophistication, therefore, may be readily detected by the eye.

Th. E.—Kino is an admirable astringent, possessing nearly similar properties to catechu, and may be employed in the same diseases. It is generally supposed to be better adapted for menorrhagia and leucorrhœa; and as it is more tonic, owing to the extractive which it contains, it should be preferred where great debility exists.

D. & M. of Adm.—In powder, gr. x. to ʒss. *Pulvis Kino comp.*, D. L. (Kino, ʒxv.; cinnamon, ʒss.; hard opium, ʒi.; rub separately to fine powder, and mix.) An excellent astringent in chronic diarrhœa and dysentery; it has also been highly praised in pyrosis; gr. xx. contain gr. i. of opium; dose, gr. x. to gr. xxx.—*Tinctura Kino*, D. L. E. (Kino, bruised (in (moderately fine, E.) powder, L. E.), ʒiij. (ʒiiiss., L. E.); proof (rectified, L. E.) spirit, *by measure*, ℔ij. (Oij., L. E.); macerate (digest, E.) for 7 (14, L.) days, and filter. "This tincture cannot be conveniently prepared by percolation," E.) Dose, fʒj. to fʒij.

Incomp.—The mineral acids; carbonates of the alkalies; sulphate of iron; nitrate of silver; acetate of lead; and gelatin.

Krameria, L. E. Krameria triandra, radix et extractum, D. *Rhatany; The root (and extract, D.) of Krameria triandra.*—A native of Peru, belonging to the natural family *Polygalaceæ*, and to the Linnæan class and order *Tetrandria Monogynia.*

B. C.—Stem shrubby, procumbent; leaves villous-silky, oblong, sessile; flowers solitary, reddish; stamens 3, whence the specific name.

P. P.—Numerous, long, woody root branches, to which the common root-stock, about an inch in length, is often attached; they consist of a reddish-brown, smooth bark, nearly an eighth of an inch in thickness, and a yellow, hard, woody centre (*Meditullium*); they are inodorous, the bark has an intensely astringent, somewhat bitter taste, but the woody centre is nearly tasteless.

C. P.—The bark of rhatany root consists of nearly 43 per cent. of tannin, a trace of gallic acid, 56 per cent. of gum, extractive, and colouring matter, and a small quantity of a peculiar acid which has been named *Krameric acid.* It yields its active principles to cold water and to alcohol.

Th. E.—Rhatany root is a powerful astringent and tonic, and as such is employed with much benefit in the treatment of chronic diarrhœa and of dysentery, in passive hœmorrhages, in menorrhagia, and in atonic mucous discharges. As a topical astringent, it may be applied in the form of powder to indolent ulcers with excessive discharges; and as a styptic, to arrest hœmorrhage, when it proceeds from very small vessels. Rhatany root finely powdered is a constituent of most tooth powders; it reddens and consolidates the gums, and whitens the teeth.

D. & M. of Adm.—In powder, gr. x. to ʒss.—*Extractum Kra-*

meriæ, D. E. (An article of the Materia Medica, D.—"Prepared in the same way as extract of liquorice," E.) Dose, gr. xx. to gr. xl.—*Infusum Krameriæ*, L. (Rhatany, ʒi.; boiling distilled water, Oi.; macerate for 4 hours in a vessel lightly covered, and strain.) Dose, fʒi. to fʒij. This infusion becomes quite turbid on cooling, and would be better made with cold water by the process of percolation.

Incomp.—All substances incompatible with tannin.

Lythrum salicaria, herba, D. *Purple Loosetrife.*—An indigenous plant, belonging to the natural family *Lythraceæ*, and to the Linnæan class and order *Dodecandria Monogynia.*

The whole of this herb possesses mildly astringent properties; it was formerly much employed in chronic diarrhœa and dysentery, but at present it has fallen completely into disuse.

Monesia.—Under this name, a few years since, an astringent extract was imported into France from South America; it was said to have been obtained from the bark of a tree, a native of Brazil, but the name of which is not known. The extract was brought over in large cakes, which were purified by dissolving in water, filtering, and evaporating; the purified extract is in small fragments resembling kino in appearance, but it has not the peculiar ruby lustre of that substance; the taste is at first sweetish, then astringent, and the odour feebly aromatic; it dissolves readily in water, affording a dull brown, somewhat opaque solution. According to the analysis of MM. Derosne and Henry, it consists of tannin, red colouring matter, glycirrhizine, and a peculiar acrid principle, which they have named *Monesine.*

Like numerous other medicines when first introduced, Monesia was extravagantly lauded as a remedy possessing powerfully astringent properties; experience has, however, proved that it is much inferior to either kino or catechu, and it probably may take an intermediate station between those substances and extract of rhatany. It has been used in all cases where astringents are admissible, both externally and internally, but the disease in which it appears to have been most serviceable is chronic diarrhœa.

D. & M. of Adm.—In substance, gr. v. to gr. xv.—*Tinctura Monesiæ*, Donovan. (Extract of monesia, ʒi.; proof spirit, fʒixss.; water, fʒij.; mix, and when the fæces have subsided, pour off the tincture.) Dose, fʒi. to fʒij.—*Mistura Monesiæ.* (Extract of monesia, ℈ij.; water, fʒviiss.; compound tincture of cardamoms, fʒss.; mix.) Dose, fʒss. to fʒij. two or three times a day.

Incomp.—Mineral acids; salts of iron, zinc, and lead; opium; and sulphate of quina.

Plumbi acetas, D. L. E. *Acetate of Lead; Sugar of Lead.*

P. P.—Usually met with in irregular white masses of acicular crystals, having an acetous odour, and a sweetish, astringent taste; the crystals are quadrangular prisms with dihedral summits.

C. P.—Acetate of lead consists of 1 eq. of protoxide of lead, 1 of acetic acid, and 3 of water (Pb O ($C^4H^3O^3$)+3 HO). It effloresces slowly by exposure to the air, losing part of its acetic acid, and attracting carbonic acid, thereby becoming partially insoluble. By heat, the salt fuses in its water of crystallization, which is all driven off; and if the heat be increased, decomposition takes place. It is soluble in less than twice its weight of water at 60°, in less of boiling water, and in 8 parts of alcohol. The solution reddens litmus paper.

Prep.—*Dub.* "Carbonate of lead (*cerusse*), any quantity; distilled vinegar, ten times its weight; digest in a glass vessel, till the vinegar becomes sweet; pour off the liquor and add more vinegar, as long as it continues to be sweetened; filter the liquors, and, by alternate slow evaporation and cooling, obtain crystals, which are to be dried in the shade." *Lond.* "Oxyde of lead rubbed to powder, ℔iv. ʒij.; acetic acid and distilled water, of each, Oiv.; mix the acid with the water, and add the oxyde of lead to them, dissolve with a gentle heat, and strain; lastly, evaporate, so as to form crystals." *Edin.* "Pyroligneous acid, of the density 1034, Oij.; distilled water, Oj.; litharge, ʒxiv.; mix the acid and water, add the litharge, dissolve it with the aid of a gentle heat, filter, and concentrate the solution sufficiently for crystallization on cooling."

Adulterations.—This salt is usually met with in commerce sufficiently pure for medical use. In the Edinburgh Pharmacopœia, the following tests are given by which a hundredth part of impurity may be easily detected: "Entirely soluble in distilled water, acidulated with acetic acid: 48 grains thus dissolved are not entirely precipitated by a solution of 30 grains of phosphate of soda."

Th. E.—Acetate of lead taken in large doses acts as an irritant, causing inflammation of the stomach and intestines, with intense pain and vomiting. In medicinal doses it operates as a sedative-astringent, and as such is employed with benefit in the treatment of disease, where the indication is to lower the circulation, and at the same time check excessive discharge. In all forms of passive hœmorrhage it proves singularly serviceable; and when the bleeding is of an active character, it may be beneficially employed in conjunction with antiphlogistic treatment. In the autumnal cholera of this country, acetate of lead, combined with opium, is the remedy on which most reliance is to be placed; and this combination has been highly spoken of by many practitioners for the treatment of Asiatic cholera. In chronic diarrhœa and dysentery it also proves serviceable; but for diminishing expectoration, and checking the colliquative sweating and diarrhœa of phthisis, it is much inferior to dilute sulphuric acid. As a topical remedy, a solution of this salt is employed with benefit in most forms of superficial inflammation of a phlegmonous character, in ophthalmia, in gonorrhœa, gleet, and leucorrhœa, and in cutaneous eruptions attended with surrounding inflammation. A collyrium of the acetate of lead should not be employed in any form of ophthalmia when the cornea is ulcerated, as it produces an indelible white stain, which becomes imbedded in the substance of the cornea; an observation first made by Dr. Jacob, of Dublin.

D. & M. of Adm.—Gr. ij. to gr. viij., in the form of pill, twice or thrice daily.—*Pilulæ plumbi opiatæ*, E. (Acetate of lead, 6 parts;

opium, 1 part; conserve of red roses, about one part; beat them into a proper mass, which is to be divided into four-grain pills. This pill may be made, also, with twice the quantity of opium.) This forms a most useful astringent combination; each pill contains 3 grains of acetate of lead and half a grain of opium; dose, 2 or 3 pills, three times a day.—*Unguentum* (*Ceratum*, L.) *plumbi acetatis*, D. L. E. ("Ointment of white wax, ℔iss.; acetate of lead, ʒi.; make an ointment," D. "Acetate of lead, powdered, ʒij.; white wax, ʒij.; olive oil, fʒviij.; dissolve the wax in fʒvij. of the oil, then to these add gradually the acetate of lead separately rubbed with the remainder of the oil, and stir with a spatula till they unite," L. "Simple ointment, ʒxx.; acetate of lead, in fine powder, ʒi.; mix them thoroughly," E.) A soothing and astringent application to irritable ulcers or excoriated parts.

Incomp.—Hard water; the mineral acids, and their salts; citric, tartaric, and carbonic acids, and their salts; the alkalies; lime-water; iodide of potassium; tincture of galls; opium; albuminous liquids; and various vegetable infusions.

When an overdose of acetate of lead has been taken, sulphate and phosphate of soda, and sulphate of magnesia, are the best antidotes; their administration should be succeeded by emetics, and afterward by active purgatives and opium.

Plumbi carbonas, D. L. E. *Carbonate of Lead, White Lead; Cerusse.*

P. P.—A heavy, white, obscurely-crystalline powder; sometimes met with in grayish-white, chalk-like masses; inodorous and tasteless.

C. P.—It is composed of 1 eq. of protoxyde of lead, and 1 of carbonic acid (PbO, CO^2). Exposed to heat, it parts with its carbonic acid, and is converted into the yellow oxyde of lead. It is insoluble in water, but dissolves in nitric acid with effervescence.

Prep.—An article of the Materia Medica. On the large scale, it is generally prepared by exposing bars or plates of lead to the fumes of strong acetic or pyroligneous acid, disengaged from the iron pots in which it is contained, by placing them in a mixture of dung and tanners' refuse. The carbonate forms on the surface of the lead, and is detached by rolling the plates under water. On the Continent it is also frequently prepared by transmitting a current of carbonic acid gas through a solution of acetate of lead.

Adulterations.—Carbonate of lead is very much adulterated; the impurities generally found in it are chalk, sulphate of baryta, and sulphate of lead; the two latter may be detected by their insolubility in dilute nitric acid. The presence of chalk may be discovered by dissolving the suspected specimen in dilute nitric acid, throwing down the lead from the solution by sulphuretted hydrogen, filtering, and adding solution of oxalate of ammonia; when, if any chalk had been present, a white precipitate (oxalate of lime) will be produced.

Th. E.—Carbonate of lead is more apt to produce lead-colic than any other of the preparations of this metal; it is, consequently, never used internally. Topically, it acts as a sedative-astringent, and is employed in the form of ointment to promote the cicatrization of

excoriated parts and slight ulcerations. Spread on leather, it is said to prove useful applied over the seat of the pain in local neuralgia.—*Unguentum plumbi carbonatis*, D. E. ("Carbonate of lead, in very fine powder, ʒij.; ointment of white wax, ℔j.; make into an ointment," D. "Simple ointment, ʒv.; carbonate of lead, ʒi.; mix thoroughly," E.)

Plumbi diacetatis (subacetatis, D.) liquor, D. L. Plumbi diacetatis solutio, E. *Solution of Diacetate of Lead; Gowlard's Extract; Extract of Saturn.*

P. P.—This solution is transparent and colourless; it has a weak acetous odour, and a sweetish, astringent taste. Sp. gr., 1·118 at 68° (D.); 1·260 at 62° (L.).

C. P.—It is an aqueous solution of diacetate of lead, which salt may be obtained in a crystalline form by evaporation; crystallized diacetate of lead is composed of 1 eq. of acetic acid, 2 of protoxyde of lead, and ten of water ($2\ PbO, (C^4H^3O^3)+10\ HO$). Exposed to the air, it deposites a white precipitate of carbonate of lead; the same effect is produced by adding a solution of carbonic acid or a carbonate.

Prep.—*Dub.* "Semivitrified oxyde of lead, 1 part; distilled vinegar, 12 parts; boil down the mixture in a glass vessel, until 11 parts remain; set aside the liquor, and when the impurities have subsided, filter." *Lond.* "Acetate of lead, ℔ij. ʒiij.; oxyde of lead, rubbed to powder, ℔j. ʒiv.; water, Ovi.; boil them for half an hour, frequently stirring, and when the liquor is cold, add of distilled water as much as may be sufficient to measure with it, Ovi.; lastly, strain the solution." *Edin.* "Acetate of lead, ʒvj. ʒvi.; litharge, in fine powder, ʒiv.; water, Oiss.; boil together, stirring occasionally; when the solution is cold, add water, if necessary, to make up Oiss.; and then filter. Preserve the solution in well-closed bottles."

Th. E.—This solution is not used internally; externally, it is employed, properly diluted, in the same cases as a solution of acetate of lead; the only advantage it possesses over which is, that it does not dry up so quickly.—*Plumbi subacetatis liquor comp.*, D. *Liquor plumbi diacetatis dilutus*, L. (Solution of subacetate (diacetate, L.) of lead, ʒi. (fʒiss., L.); distilled water, ℔i. (Oj., L.); proof spirit, ʒi. (fʒij., L.); mix.) This preparation is too weak for general use.—*Ceratum plumbi comp.*, L. (Solution of diacetate of lead, fʒiij.; wax, ʒiv.; olive oil, Oss.; camphor, ʒss.; mix the melted wax with fʒviij. of the oil, then remove them from the fire, and, when first they begin to thicken, add gradually the solution of diacetate of lead, and stir them constantly with a spatula until they cool; lastly, mix with them the camphor dissolved in the remainder of the oil.) *Gowlard's Cerate;* employed as a dressing to diminish pain and irritation.

Incomp.—Same as for acetate of lead; solution of gum; organic matter; and soap liniment.

Plumbi oxydum semivitreum, D. L. Lithargyrum, E. *Fused protoxyde of lead; Litharge.*—Though much employed in pharmacy and the arts, litharge is only used in medicine as a desiccative and astringent powder, to sprinkle over excoriated parts and super-

ficial ulcerations. It enters into the composition of the following ointments: *Emplastrum Lithargyri*, D. E. *Emplastrum Plumbi*, L. (Litharge, in very fine powder, ℔v. (℔vj., L.; ℥v., E.); olive oil, cong. j. (f℥xij., E.); water, *by measure*, ℔ij. (Oij., L.; f℥iij., E.); boil together (with a superior heat, D.; over a slow fire, L.), stirring constantly, until the oil and litharge unite into the consistence of a plaster; it will be proper to add a little boiling water if it evaporate too far.) *Diachylon plaster;* it is used for retaining the edges of fresh wounds in contact, and as the basis of many other plasters.—*Unguentum plumbi compositum*, L. (Prepared chalk, ℥viij.; distilled vinegar, f℥vj.; plaster of lead, ℔iij.; olive oil, Oi.; melt the plaster in the oil with a slow fire; then gradually add the chalk separately mixed with the vinegar, the effervescence being finished, and stir constantly till they are cooled.) Generally used as a dressing for indolent ulcers.—*Emplastrum Lithargyri cum Resina*, D. *Emplast. Resinæ*, L. *Emplast. Resinorum*, E. (Litharge plaster, ℔iiiss. (℔iij., L.; ℥v., E.); resin (yellow, D.), ℔ss. (℥i., E.); add the resin, powdered, to the litharge plaster melted over a slow fire, and mix.) This is the *adhesive* or *sticking plaster* of the shops, commonly used for retaining the edges of wounds in contact, and for strapping ulcers.—*Emplastrum Saponis*, D. L. E. (Litharge plaster, ℔iij. (℥iv., E.); soap (hard, D.; Castile, E.), sliced, ℔ss. (℥i.; gum plaster, ℥ij., E.); melt the plasters, add the soap, and boil down to a proper consistence.) This plaster, when kept, is apt to crumble to powder, to obviate which, the Edinburgh College have added the gum plaster. It is chiefly employed to give mechanical support.—*Emplastrum Saponis compositum vel adhærens*, D. (Soap plaster, ℥ij.; plaster of litharge and resin, ℥iij.; make into a plaster, which should be melted and spread on linen.) An excellent application for the prevention of bed-sores.—*Ceratum Saponis*, L. (Soap, ℥x.; wax, ℥xiiss.; oxyde of lead, powdered, ℥xv.; olive oil, Oi.; vinegar, cong. j.; boil the vinegar with the oxyde of lead over a slow fire, constantly stirring them till they unite; then add the soap, and boil again in a similar manner, until all the moisture is evaporated; lastly, mix with these the wax, previously dissolved in the oil.) A cooling, astringent dressing.

Polygonum bistorta, radix, D. *Bistort; Root of Polygonum bistorta.*—Indigenous; belonging to the natural family *Polygonaceæ*, and to the Linnæan class and order *Octandria Trigynia.*

B. C.—Root perennial; stem herbaceous, annual, 1–1½ feet high; leaves ovate, waved; flowers rose-coloured, in a dense, cylindrical spike.

P. & C. P.—The root is dark-brown externally, wrinkled and tortuous; reddish internally; inodorous; taste strongly astringent. It contains a large quantity of tannin, some gallic acid, starch, and woody fibre; it yields its astringency to both water and alcohol.

Th. E.—Bistort is among the most powerful of our indigenous astringents; nevertheless, it has nearly fallen into disuse. It may be employed with benefit in chronic mucous discharges, and in passive hæmorrhages.

D. & M. OF ADM.—In powder, ʒss. to ʒi.—*Decoctum Bistortæ.* (Bistort, ʒij.; boiling water, Oiss.; boil down to Oi.) Dose, fʒi. to fʒij.

INCOMP.—All substances incompatible with tannin, and tincture of iodine.

PUNICA GRANATUM, BACCÆ TUNICA EXTERIOR ET FLORES, D. GRANATUM, L. [GRANATI FRUCTUS CORTEX, U. S. P.] *The bark of the fruit (and the flowers, D.) of Punica Granatum.*—This tree has been described in the division Anthelmintics.

P. P.—The fruit rind is met with in the shops, in arched, irregular pieces, reddish-brown and warty on the outside, yellowish within, about a line in thickness; inodorous; with a bitter, astringent taste. The flowers are reddish, odourless, and have a weak, astringent taste; they are not used at present.

C. P.—The rind of the pomegranate consists of 18·8 per cent. of tannin, 17·1 of mucilage, 10·8 of extractive, 30 of lignin, and at race of resin. It yields its astringency to both water and alcohol.

TH. E.—Pomegranate rind may be used as an astringent in the same cases as the other vegetable remedies of this class; but at present it is rarely employed.

D. & M. OF ADM.—In powder, ʒss. to ʒi. *Decoctum Granati,* L. (Pomegranate rind, ʒij.; distilled water, Oiss.; boil down to Oj., and strain.) Dose, fʒss. to fʒi.

INCOMP.—All substances incompatible with tannin.

QUERCUS, L. QUERCUS CORTEX, E. QUERCUS ROBUR, CORTEX, D. —*Oak bark; Bark of Quercus pedunculata* (Willdenow), L. E.; *of Quercus robur* (Linnæus), D.—Indigenous; belonging to the natural family *Cupuliferæ,* and to the Linnæan class and order *Monœcia Polyandria.*

B. C.—A large, long-lived tree; leaves bright green, deciduous; flowers, *male,* yellowish; *female,* greenish, tinged with brown; fruit (acorns), 2 or 3 on a long peduncle, surrounded at the base by the cupule.

P. P.—Oak bark is in pieces of various lengths, silvery-gray on the outside, reddish-brown within; inodorous; taste powerfully astringent; the pieces are brittle, and break with a short fracture.

C. P.—It contains from 15 to 20 per cent. of tannin, with some gallic acid, uncrystallizable sugar, pectin, and salts. It yields its virtues to both water and alcohol.

TH. E.—Oak bark is an excellent astringent, and may be employed in the treatment of chronic diarrahœa and dysentery, in alvine hœmorrhages, and to check atonic mucous discharges. As a topical remedy, it is used with benefit in the form of decoction; as a gargle, in relaxation of the uvula and tonsils; and as an injection, in fluor albus, and in prolapsus of the uterus or rectum.

D. & M. OF ADM.—In powder, a bad form, ʒss. to ʒi.—*Decoctum Quercus,* D. L. E. (Oak bark (bruised, L.), ʒi. (ʒx., L. E.); water (distilled, L.), Oij. (℔ij., D.); boil down to Oj. (℔j., D.), and strain.) Dose, fʒi. to fʒiv. A convenient strength for a gargle,

injection, or lotion.—*Extractum Quercus*, D. (Prepared as the simpler extracts.) Not much used; dose, gr. x. to ʒj.

Incomp.—All substances incompatible with tannin.

Rosa gallica, D. L. E. *Red rose. Petals of Rosa gallica.*—A native of the middle and south of Europe, now cultivated extensively in our gardens. It belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia.*

B. C.—An undershrub, very variable in size and character, owing to cultivation; the flowers are of a fine purplish-red colour, spreading.

P. P.—The dried petals have a velvety appearance, an agreeable roseate odour, which is developed during desiccation, and a somewhat aromatic, bitter, astringent taste. They should be gathered before the flowers expand, the white claw cut off, and then dried quickly with a stove heat.

C. P.—They consist of volatile oil, tannin, gallic acid, colouring matter, albumen, fatty matter, and some salts. They yield their properties to boiling water, affording a reddish-yellow solution, which is changed to bright red by sulphuric acid.

Th. E.—The petals of the red rose are very mildly astringent, and are chiefly employed in medicine on account of their colour and odour, the officinal preparations forming agreeable vehicles for the administration of more active medicines.

D. & M. of Adm.—*Infusum Rosæ*, E. *Inf. Rosæ acidum*, D. *Inf. Rosæ comp.*, L. ("Red-rose petals, dried and deprived of their claws, ʒss.; dilute sulphuric acid, *by measure*, ʒiij.; boiling water, *by measure*, ℔iij.; purified sugar, ʒiss.; first pour the water on the petals in a glass vessel; then add the acid, and digest for half an hour; strain the cooled liquor, and add the sugar," D.—"Red-rose petals, dried, ʒiij.; dilute sulphuric acid, fʒiss.; sugar, ʒvi.; boiling distilled water, Oj.; pour the water on the rose petals in a glass vessel; then mix in the acid. Macerate for six hours, and strain the liquor; lastly, add the sugar to it," L.—The *Edinburgh College* employs the same proportions as the *London*. The petals are to be infused in the water in a covered vessel of glass or porcelain, not glazed with lead, for an hour; the acid added, the liquor strained through linen or calico, and the sugar dissolved in it.) An agreeable refrigerant and mild astringent; dose, fʒi. to fʒij. It forms one of the best vehicles for the administration of the neutral purgative salts.—*Conserva Rosæ*, D. E. *Confectio Rosæ gallicæ*, L. ("Red-rose petals, ℔j.; sugar, ℔iij.; bruise the petals in a stone mortar, then, the sugar being added, pound them again until they are thoroughly incorporated," D. L. "Beat the petals of Rosa gallica to a pulp, gradually adding twice their weight of sugar," E.) A very weak astringent; dose, ʒi. to ʒij. It is principally used as a basis for pills, for which purpose it is the best material that can be used, as it neither hardens, nor becomes candied by keeping.—*Mel Rosæ*, D. L. E. (Red-rose petals, dried (and without the claws, D.), ʒiv.; boiling water, *by measure*, ℔iij. (Oiiss., L. E.); honey, ℔v. "Macerate the rose petals in the water for

six hours, then add the honey to the strained liquor, and (in a water-bath, L.) boil down to the consistence of sirup (removing the scum, D.)," D. L. "Infuse the petals in the water for six hours, strain, and squeeze; let the impurities subside; pour off the clear liquor, mix with it the honey, and evaporate the whole to the consistence of sirup, removing the scum," E.) Chiefly employed as an addition to astringent gargles; dose, ʒij. to ʒiv.—*Sirupus Rosæ gallicæ*, E. (Dried red-rose petals, ℥ij.; pure sugar, ℥xx.; boiling water, Oj.; infuse the petals in the water for 12 hours, strain the liquor, and dissolve the sugar in it with the aid of heat.) Principally used for imparting its fine red colour to mixtures, &c.

Incomp.—All substances incompatible with tannin.

Sodæ boras, D. Borax; Sodæ biboras, L. E. *Borax; Biborate of Soda.*

P. P.—Usually met with in large, translucent, colourless crystals, aggregated together; the crystals are either oblique rhombic prisms, or regular octohedrons: inodorous, with a somewhat styptic, alkaline taste.

C. P.—Crystallized borax consists of one eq. of soda, 2 of boracic acid, and 10 of water ($Na\,O, 2\,BO^3+10\,HO$); but *octahedral borax* contains only 5 atoms of water. Exposed to the air, it effloresces slowly; heated, it melts in its water of crystallization, which, if the heat be increased, is driven off, and a light anhydrous salt, *calcined borax*, left; at a still higher temperature it fuses again, and as it cools, forms a transparent solid, *glass of borax*. Borax is soluble in 12 parts of cold and in 2 of boiling water; the solution is alkaline, changing the vegetable blues to green. In solution, this salt is readily recognised by adding sulphuric acid, which precipitates boracic acid in pearly, crystalline scales.

Prep.—An article of the Materia Medica; on the large scale, it is prepared either by refining crude borax of commerce, *Tincal*, a natural crystalline formation, met with on the shores of some lakes in Thibet and Persia; or by saturating native boracic acid, obtained from the lagoons of Tuscany, with carbonate of soda.

Borax is not liable to adulteration.

Th. E.—Borax is only employed in medicine as a topical astringent, in aphthous ulcerations of the mouth and throat, in excessive mercurial salivation, and in some forms of chronic skin disease.

D. & M. of Adm.—For a lotion or gargle, gr. xx. to gr. xxx. may be dissolved in f℥i. of water, or ℥i. of the following preparation in f℥v. of water: *Mel Boracis*, D. L. E. (Borax, powdered, ʒj.; clarified honey, ℥i.; mix.) The best form for applying borax to aphthous ulcerations.

Incomp.—The mineral acids, and most of their salts.

Tannin. *Tannin; Tannic acid.*—A peculiar principle, on which the astringent property of vegetable substances chiefly depends.

Prep.—"Macerate powdered galls for twenty-four hours in a closely-stopped bottle, with sufficient sulphuric ether to moisten them; express strongly with a power-

ful press; repeat the process until the galls are completely exhausted; recover as much as possible of the ether by distillation, and evaporate the residue to dryness over the vapour-bath."—LECONET.

P. P.—Thus obtained, tannic acid is a yellowish-white, uncrystallizable solid, shining and pulverulent; inodorous; taste purely astringent, void of all bitterness.

C. P.—Its composition is $C^{18}H^{8}O^{12}$. Exposed to the air, it absorbs oxygen, and is almost entirely converted into *gallic acid.* It is very soluble in water, moderately so in alcohol or proof spirit, and but sparingly soluble in ether. Its solution reddens litmus paper.

TH. E.—Tannic acid is powerfully astringent, and has been employed on the Continent with much success in the treatment of the various forms of atonic hœmorrhage, and in chronic mucous discharges; it has been found peculiarly efficacious in menorrhagia, and in the colliquative sweating and diarrhœa of hectic.

D. & M. OF ADM.—Gr. ss. to gr. j. or gr. ij., in the form of pill, or dissolved in water. It has been also employed in the form of gargle, injection, or lotion, in the proportion of gr. v. to gr. viij. of tannin, to f℥i. of water.

INCOMP.—The mineral acids; the alkalies, and their carbonates; lime-water, acetate of lead, nitrate of silver, tartar emetic, the vegetable alkaloids, and gelatin.

TORMENTILLA, D. L. E. *Tormentil; Root of Potentilla tormentilla*, L. E.; *of Tormentilla officinalis*, D.—Indigenous; belonging to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia.*

Tormentil root contains about 18 per cent. of tannin, and, consequently, is an astringent of some power, and may be used in the same cases as the other vegetable astringents. At present, however, it is scarcely ever employed, except as a domestic remedy. The dose of the powdered root is from ʒss. to ʒi., three or four times a day. The decoction is a better mode of administering it: *Decoctum Tormentillæ*, L. (Tormentil, bruised, ℥ij.; distilled water, Oiss. Boil down to Oj., and strain.) Dose, f℥i. to f℥iss., two or three times a day. It is also an excellent astringent lotion or injection.

UVA-URSI, D. L. E. *Bearberry; Leaves of Arctostaphylos Uva-ursi*, L. E.; *of Arbutus Uva-ursi*, D.—Indigenous; belonging to the natural family *Ericaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A small, trailing shrub; leaves obovate, entire, evergreen; flowers rose-coloured, in terminal racemes; berry globose, scarlet, 4–5 seeded.

P. P.—The dried leaves are dark-green, shining, convex above, concave and reticulated on the under surface; they have a very astringent, somewhat bitter taste, and emit a faint odour in the process of pulverization.

C. P.—They contain 36·4 per cent. of tannin, with some gallic

acid, resin, extractive, salts, &c. They yield their astringency to water and to alcohol.

Adulterations.—The leaves of the red whortleberry (*Vaccinium Vitis-idæa*) and of the common box (*Buxus sempervirens*) are often either mixed with, or substituted for, uva-ursi; the former are readily distinguished by their under surface being dotted, not reticulate; and the latter, by their want of astringency.

Th. E.—The employment of uva-ursi as an astringent is now altogether restricted to chronic diseases of the urino-genital apparatus, attended with mucous discharge; as in the advanced stages of catarrh of the bladder, in gleet, leucorrhœa, &c. To produce any beneficial effects, its use must be persevered in for a considerable time.

D. & M. of Adm.—In powder, gr. xx. to ʒj.—*Extractum Uvæ-ursi*, L. (Uva-ursi, bruised, ℔iiss.; boiling distilled water, cong. ij.; macerate for 24 hours; then boil down to a gallon, and strain the liquor while yet hot; lastly, evaporate to a proper consistence.) Dose, gr. v. to gr. xv., two or three times a day.—*Decoctum Uvæ-ursi*, L. (Uva-ursi, bruised, ʒi.; distilled water, Oiss.; boil down to Oj., and strain.) Dose, fʒi. to fʒiij.

Incomp.—All substances incompatible with tannin.

Zinci acetas. *Acetate of Zinc.*

P. P.—This salt occurs in small, white, rhomboidal plates, with a pearly lustre; inodorous; having a bitter, styptic taste.

C. P.—It is composed of 1 eq. of oxyde of zinc, 1 of acetic acid, and 7 of water ($Zn\,O, (C^4H^3O^3)+7\,HO$). Exposed to the air, it effloresces slowly. It is very soluble in water and in alcohol.

Prep.—Acetate of zinc may be readily prepared by dissolving the oxyde, or carbonate of the metal in dilute acetic acid, filtering and evaporating, so as to obtain crystals.

Th. E.—Dissolved in spirit or in water, this salt is used as a topical astringent in ophthalmia, and in chronic mucous discharges. As soon as the inflammatory symptoms have subsided, it forms an excellent injection in gonorrhœa. It is not employed internally.

D. & M. of Adm.—For a lotion or injection, gr. ij. to gr. x. may be dissolved in fʒi. of distilled water.—*Tinctura acetatis zinci*, D. (Sulphate of zinc and acetate of potash, of each, 1 part; rub together, and add 16 parts of rectified spirit; macerate for a week, frequently agitating, and filter through paper.) One drachm contains a quantity of the salt nearly equal to four grains of the crystallized acetate; largely diluted with water, it forms an excellent cooling, astringent lotion.

Incomp.—The stronger acids; the alkalies and their carbonates; and lime-water.

Zinci carbonas impurum, D. Calamina, L. E. *Impure carbonate of zinc; Calamine.*—This is one of the most common ores of zinc; previous to its being used for medical purposes, it is directed by the colleges to be burned with a red heat, and reduced to fine pow-

der in the same manner as prepared chalk. It then constitutes prepared calamine, *Zinci carbonas impurum præparatum*, D.; *Calamina præparata*, L. E. It is commonly met with in the form of a heavy, flesh-coloured powder; when pure, almost entirely soluble in sulphuric acid; it is generally a very impure oxyde of zinc, most, if not all, of the carbonic acid having been dried off by the roasting. Calamine is used in powder, or in the form of ointment, as a mild desiccative and astringent for the treatment of intertrigo, excoriations, and superficial ulcerations. The following is the only officinal preparation: *Unguentum Calaminæ*, D. E. *Ceratum Calaminæ*, L. ("Ointment of yellow wax, ℔v.; prepared impure carbonate of zinc, dried, ℔j.; rub the carbonate of zinc until it is completely powdered; then add it to the ointment, and mix," D. "Calamine, wax, of each, ℔ss.; olive oil, f℥xvj.; mix the oil with the melted wax; then remove them from the fire, and when first they begin to thicken add the calamine, and stir constantly till they cool," L. "Calamine, prepared in the same way as prepared chalk, 1 part; simple cerate, 5 parts; mix them well together," E.) This preparation, under the name of *Turner's cerate*, is in very general use, as a desiccative and healing ointment.

Zinci oxydum, D. L. E. *Oxyde of Zinc; Flowers of Zinc.*

P. P.—A yellowish-white, earthy powder; inodorous and tasteless.

C. P.—It is composed of 1 eq. of zinc, and 1 of oxygen (Zn O). When heated it becomes yellow, but regains its whiteness as it cools; at a white heat it is volatilized. Oxyde of zinc is insoluble in water, but most acids dissolve it readily; from its solution in any of the acids, it is precipitated by ammonia as a white gelatinous hydrate, which is redissolved by an excess of the alkali.

Prep.—*Dub.* "Zinc, in small fragments, any quantity; throw it at separate intervals into a crucible, sufficiently deep, heated to whiteness, the mouth being inclined somewhat towards the mouth of the furnace; after the injection of each piece of zinc, invert another crucible over it lightly, so as not to exclude the air; preserve for use the light and very white sublimed powder." *Lond.* "Sulphate of zinc, ℔j.; sesquicarbonate of ammonia, ℥viss.; distilled water, cong. iij.; dissolve the sulphate of zinc and sesquicarbonate of ammonia, separately, in Oxij. of the distilled water, and strain; then mix. Wash what is precipitated frequently with water; and, lastly, burn it for 2 hours in a strong fire." *Edin.* "Sulphate of zinc, ℥xij.; carbonate of ammonia, ℥ij.; dissolve each in Oij. of water; mix the solutions; collect the precipitate on a cloth; wash it thoroughly; squeeze and dry it; expose it for 2 hours to a red heat."

Adulterations.—As met with in the shops, this preparation generally contains carbonate or sulphate of zinc, sometimes, also, lime and iron. The tests of the Edinburgh Pharmacopœia will detect these impurities: "White; tasteless; entirely soluble in dilute nitric acid; this solution is not affected by nitrate of baryta, but gives, with ammonia, a white precipitate entirely soluble in an excess of the test."

Th. E.—As an astringent, oxyde of zinc is only employed externally, in the form of powder or ointment, to slight excoriations, chapped nipples, intertrigo, superficial ulcerations, and in ophthalmia tarsi.

D. & M. of Adm.—*Unguentum* (*oxydi*, D.) *zinci*, D. L. E. (Oxyde of zinc, ʒij. (ʒi., L. E.) ; ointment of white wax, ℔i. (prepared lard, ʒvj., L. ; simple liniment, ʒvj., E.) ; "melt the ointment, and mix in the oxyde in very fine powder," D. ; "mix well," L. E.)

Zinci sulphas, D. L. E. *Sulphate of Zinc ; White Vitriol.*

P. P.—This salt is met with in the shops, in small fragments of transparent, colourless crystals, the primary form of which is the right rhombic prism ; they are inodorous, but have a styptic, metallic taste.

C. P.—It is composed of 1 eq. of oxyde of zinc, 1 of sulphuric acid, and 7 of water (Zn O, SO^3+7 HO). It effloresces in dry warm air ; heated, it melts in its water of crystallization, which, if the temperature be increased, is all driven off ; and at an intense heat it is decomposed, the acid being expelled, and the oxyde of zinc only remaining. Sulphate of zinc is soluble in 2½ parts of temperate water, and in less than its own weight of boiling water ; it is also soluble in alcohol.

Prep.—*Dub.* "Zinc, in small fragments, 30 parts ; sulphuric acid, 20 parts ; water, 120 parts ; pour the acid, previously diluted with the water, gradually on the zinc in a glass vessel ; when the effervescence has ceased, digest the mixture for some time ; then evaporate the filtered liquor, and after the requisite evaporation, set aside, that crystals may form." *Lond.* "Zinc, in small pieces, ʒv. ; dilute sulphuric acid, Oij. ; pour gradually the acids upon the pieces of zinc ; and when the effervescence has ceased, strain ; then boil down until a pellicle begins to form. Lastly, set aside, that crystals may be formed." *Edin.* "It may be prepared either by dissolving fragments of zinc in diluted sulphuric acid, till a neutral liquid be obtained, filtering the solution, and concentrating sufficiently for it to crystallize on cooling ; or by repeatedly dissolving and crystallizing the impure sulphate of zinc of commerce, until the product, when dissolved in water, does not yield a black precipitate with tincture of galls."

Adulterations.—The only impurity of any importance met with in this salt is oxyde of iron ; it may be readily detected by adding ammonia to a solution of the sulphate, when a white precipitate will be produced, soluble in an excess of the alkali ; but if any iron be present, it will not be redissolved.

Th. E.—In large doses, unless discharged by vomiting, sulphate of zinc is an irritant poison. In small doses it acts as an astringent, and is beneficially employed as such in chronic diarrhœa and dysentery, in excessive secretion from the bronchial tubes unaccompanied with inflammation, in fluor albus, and in gleet. As a topical remedy, it is very much employed in solution ; as a collyrium, in chronic ophthalmia ; as a lotion, in old ulcers attended with profuse discharge ; and as an injection, in the advanced stages of gonorrhœa, in gleet, and in leucorrhœa.

D. & M. of Adm.—Gr. j. to gr. v., made into pill with conserve of roses, or with some astringent extract. For external use, gr. j. to ʒss., according to circumstances, may be dissolved in fʒi. of water.

Incomp.—Alkalies, and their carbonates ; lime-water ; acetate of lead ; and nitrate of silver.

In poisoning with this salt, warm demulcent drinks, as infusion of linseed, decoction of barley, &c., should be administered to pro-

mote its evacuation. Should inflammatory symptoms occur subsequently, they are to be combated by the usual antiphlogistic remedies.

CHAPTER V.

CATHARTICS.

(Purgatives.)

Cathartics may be defined, medicines which quicken or increase alvine evacuations. Cathartics vary much in the manner in which they produce their effects. Some act merely by exciting the muscular fibres of the intestines to increased peristaltic motion, and thus cause their contents to be more quickly and more completely evacuated. Some stimulate the mucous follicles and exhalants, so that a larger quantity of fluids than usual is excreted from the inner coat of the intestines, and thus the fæcal evacuations are rendered more liquid and more copious. In many, both those properties are united; and some extend their stimulus to the neighbouring viscera also, and hence produce an increased discharge of the supplementary intestinal secretions, as the bile and pancreatic juice. Cathartics differ also as to the part of the intestinal canal on which they act; the effects of some being confined to the small, of others to the large intestines, while many of them appear to stimulate the entire tube. They differ, moreover, as to the degree in which they produce their effects, and hence have been generally divided into three classes: 1st. *Laxatives*, which operate so mildly as merely to produce the evacuation of the intestinal contents without causing increased secretion or stimulating any of the neighbouring viscera. 2d. *Purgatives*, properly so called, which, besides remarkably increasing the peristaltic action of the intestines, occasion increased excretion of fluids from the exhalant vessels and from the neighbouring viscera, and also extend their stimulant effects to the system in general. 3d. *Drastic* or *hydragogue* cathartics, which operate in the same manner as purgatives, but with much greater energy, and which, if given in an overdose, produce inflammation of the intestines, characterized by constant vomiting and purging, with intense pain. Although, for the sake of simplicity in our classification, we have arranged the remedies belonging to those three divisions under the one head *Cathartics*, in prescribing them, due attention must be paid to the distinctions in their mode of operation, so as to fulfil the indications for which they may be administered. Those distinctions will be more conveniently considered when treating of the therapeutical effects of the individual remedies of this class.

[It appears highly probable that the varieties of cathartic proper-

ties possessed by different articles of this class depend upon the time they remain in the alimentary canal before they prove stimulating to the mucous membrane lining that tube. Hence, some of them, as calomel, begin to irritate the stomach almost immediately upon entering that viscus, and most generally nauseate the patient by the commotion thus early set up in the contents by their presence. The same may be said of several other drugs of analogous properties. By the time they reach the duodenum, they seem to act with their greatest energy; and as the biliary and pancreatic ducts enter into this intestine, the organs adjacent are stimulated to action, and these secretions being restored, the peristaltic motion of the intestines is excited by the presence of the bile, rather than by any farther direct agency of the medicine. The bile is the natural purgative of the body, and when present in proper quantity and quality, cathartics are uncalled for. The superiority of calomel as a purgative depends on its being so prompt in its irritation, when given in a proper dose, that it rouses the liver into action by agitating the extremities of its ducts, while itself has not yet passed the duodenum. Other cathartics which resemble it in their operation are analogous, in their early affecting the stomach and upper bowel, thus securing biliary discharges.

That this opinion is not fanciful, appears probable when we remember that the bile of some of the inferior animals, particularly the ox-gall, and the oil extracted from the liver of codfish, is found to produce free action upon the bowels in those cases in which the function of the liver has been suspended, or when its ducts are obstructed. And in such cases, for want of a substitute for the bile, we find it necessary to combine with the calomel, or follow its administration by some active cathartic, or one which excites the peristaltic motion; for which purpose calomel appears to be inadequate itself, except when it succeeds by restoring the biliary secretion. The action of jalap, scammony, rhubarb, colocynth, &c., would seem to produce the peristaltic motion, by an analogous action to the bile itself, and have to be combined with the calomel in those cases where bile is absent, but are uncalled for when the latter succeeds in restoring the function of the liver.

There are some cathartics which, it is well known, expend their irritation invariably upon the lower intestines, appearing to enter the stomach, pass into the duodenum, and even the whole length of the canal, without exciting irritation or pain until they reach the rectum. This is eminently the case with aloes and similar agents, and hence all purging produced by these is wholly artificial, and independent of the biliary secretion, or any inordinate peristaltic motion in the upper intestines. Some articles of this class, as senna, colocynth, and scammony, seem to commence their action about the time they reach the colon, while still others produce griping in the ilium, as is the case with gamboge and other drastic articles, the pain of which about the umbilicus and the convolutions of the smaller intestines is uniform.

The cathartic effect of the waters found at the Mineral Springs

has often excited surprise, when the small quantity of purgative salts contained in the large quantity of the waters drank is disclosed by analysis. Similar effects, however, can be produced at any time by very large dilutions with water, acidulated with a similar small proportion of Epsom salts. A single teaspoonful of Epsom, dissolved in a quart of common water, if a few drops of either of the mineral acids be added, and the whole quart speedily drank, will produce as free purging as would follow 2 oz. of the same salts, if dissolved in a small quantity of water. It is, therefore, easy to explain the remarkable effect of mineral waters thus: Six or more tumblers of the water of Congress Spring, for example, are quickly drank, containing, possibly, not more than a drachm of purging salts, combined with a small portion of mineral acids and non-purging saline ingredients. The stomach is mechanically distended, as also the duodenum, by the draught of fluid, and the biliary secretion is often provoked immediately by the agitation and irritation of its ducts. Hence the peristaltic motion begins, and progresses rapidly by the distension of so large a quantity of fluid, the small dose of salts being merely auxiliary, and hastening the process. Accordingly, we find that in ordinary cases the discharges are not only bilious, but fluid to an extent corresponding with the number of glasses drank. And it will be observed, also, that in those invalids who complain at the Springs that whatever quantity of the water they drink it fails to purge them, the reason is, that the function of the liver is suspended, and the bile is absent. Nor in such persons do the waters succeed as a cathartic, until calomel, blue pill, or some similar medicine is premised, overcoming the hepatic obstruction, after which the waters have their appropriate effect.

These suggestions are introduced here as the result of much reflection and diligent observation for many years, and will admit of more amplification than in this place would be allowable. They will receive confirmation by comparing them with the therapeutical effects of the remedies named under the class of Cathartics by the author.]

Aloe, L. Aloe Socotrina, D. E. *Aloës; Socotrine aloës; from (inspissated juice of the leaves of,* L.) *Aloë spicata,* D. L.; *of an undetermined species of Aloë,* E.

Aloe hepatica, D. Aloe Barbadensis, E. Aloe Indica, E. *Hepatic aloës; Barbadoes aloës; Indian aloës. From Aloë vulgaris,* D. *Extract, or inspissated juice of one or more undetermined species of aloë,* E.—The Edinburgh College correctly states, that aloes is obtained from various species of the genus Aloë; they are inhabitants of the East and West Indies, Socotora, Barbary, and the Cape of Good Hope; and belong to the natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia.*

B. C.—The species of the genus Aloë from which the drug is obtained are generally characterized by having woody stems, with large, fleshy, amplexicaul leaves, glaucous, flat above and convex below, having marginal spines or serratures; flowers numerous, in spikes or racemes, tubular, coloured; stamens exserted.

P. U. & M. OF PREP.—The proper juice of the leaves inspissated; it is obtained by cutting the leaves transversely near their base, and evaporating the juice, which flows spontaneously from them, either in the sun or with the aid of heat; sometimes the flow of juice from the leaves is aided by plunging them in hot water; and sometimes by pressure, when an inferior sort of aloes is obtained; a still worse description is procured by evaporating a decoction of the leaves.

P. P.—Obtained in those different ways, and from various parts of the world, aloes differs much in its physical properties, consequently several varieties of the drug are met with in commerce. In addition to three kinds admitted by the Edinburgh College, we shall describe a fourth, *Cape aloes*. 1. Socotrine aloes (*Aloë Socotrina*), so named from its being prepared in the island of Socotora, whence it is imported into England either by way of Smyrna or Bombay; it is in masses of a golden-brown colour, having a smooth, glassy fracture, and a translucent garnet-red hue at the edges; the odour is fragrant and aromatic, much heightened by being breathed on, and the taste is bitter; it yields a powder of a beautiful golden-yellow colour, which is almost entirely soluble in proof spirit. The following are the characters assigned to Socotrine aloes by the Edinburgh Pharmacopœia: "In thin pieces, translucent and garnet-red, almost entirely soluble in spirit of the strength of sherry. Very rare." Socotrine aloes is most probably procured from the *Aloë Socotrina;* it is imported in skins, or in chests. 2. East Indian aloes (*Aloë Indica*, E.) is usually confounded, at least in Ireland, with the foregoing variety. It occurs in large, opaque masses, of a dark, liver-brown colour, with a dull, waxy fracture; the odour is similar to, but weaker than that of Socotrine aloes, and the taste equally bitter; it yields a dull, reddish-yellow powder, a great part of which is insoluble in proof spirit. It is brought to England in skins and chests from Bombay, but is stated to be originally obtained from the coasts of the Red Sea. It is probably derived from a species of aloë, if not identical with, nearly allied to the *Aloë Socotrina*. 3. Barbadoes aloes (*Aloë Barbadensis*, E. *Aloë hepatica*, D.) is a product of Barbadoes, Jamaica, and other West Indian Islands, whence it is imported in gourd-shells. It is of a dark liver-brown, sometimes almost black colour; the fracture is dull and opaque, the odour strong and disagreeable, resembling that of the human axilla, and the taste very bitter. It is reduced to powder with difficulty, the powder being of a dull dark-yellow colour. This variety is obtained from the *Aloë vulgaris*, and probably from some allied species. 4. Cape aloes (*Aloë Capensis*) is imported in skins and in chests from the Cape of Good Hope, and is very common in English commerce, although not introduced into any of the Pharmacopœias. It is of a glossy, resinous appearance, a dark-brown colour, with a greenish-yellow shade, especially when in small fragments, a strong, disagreeable odour, much increased by breathing on it, and an acrid, bitter taste; it is very brittle, and readily reduced to powder, which is of a shining, greenish-yellow colour. It is procured from the Aloë spicata and several other allied species.

C. P.—The most important constituent of aloes is a bitter ex-

tractive matter (*Aloësin*, Pfaff.), amounting in the finer sorts to nearly 80, in the inferior to about 50 per cent.; it is probably the active principle of the drug. The finer sorts of aloes contain also resin, and a peculiar acid (*Aloëtic acid*, Pereira); in addition to those substances, the inferior sorts contain some vegetable albumen. Aloes is almost completely soluble in boiling water, but as the water cools a dark-brown substance, insoluble in cold water, is deposited; it is very sparingly soluble in rectified spirit, but dissolves almost entirely in proof spirit, and still more readily in weaker spirit; heated, it fuses imperfectly, and, if the heat be continued, is converted into a resinous-looking, very friable mass.

Adulterations.—The only adulteration of aloes is the mixing the inferior sorts with, or substituting them for, the finer kinds; of this we can judge by the physical characters, particularly the odour when breathed on, or by the solubility in weak spirit.

Th. E.—In moderate doses, from three to ten grains, aloes acts as a stimulating cathartic, influencing especially the large intestines, on which it operates rather by exciting their peristaltic action, than producing increased secretion from their mucous membrane. It produces its effects more slowly than most other medicines of this class, from ten to eighteen hours usually elapsing before it operates. The specific action of aloes on the large intestines contra-indicates its employment in hœmorrhoidal affections, in irritation or inflammation of the pelvic viscera, the prostate gland or the urethra, in pregnancy, and during the menstrual discharge. From its mode of operation, it is also evidently not adapted for cases in which we wish to produce increased secretion from the intestinal canal, or where a speedy operation is required. The employment of aloes as a purgative is, nevertheless, very general, and perhaps there are few vegetable cathartics more extensively used. In torpor of the intestines, especially when accompanied with deficient secretion of bile, it is the most useful of this class of remedies; indeed, by many it is said to be the best substitute for that secretion, and is therefore exhibited in jaundice when unaccompanied with hepatic inflammation, mechanical obstruction of the ducts, &c. In habitual costiveness, so common in females, aloes is also administered with much benefit, due attention being paid to the circumstances which contra-indicate its employment. Christison states, that the cathartic property of aloes is much increased by its combination with sulphate of iron, and that its irritating action on the rectum is counteracted by combining it with extract of hyoscyamus.

D. & M. of Adm.—*Aloë Socotrina*, D. L. E. *Aloë Indica*, E., gr. iij. to xv.—*Aloë hepatica*, D. *Aloë Barbadensis*, E., gr. ij. to gr. v. It is best administered in the form of pill, made with honey, mucilage, &c.—*Extractum Aloës hepaticæ*, D. *Extractum Aloës purificatum*, L. ("Prepared as the simpler extracts," D.—"Aloes, powdered, ʒxv.; boiling water, cong. j.; macerate for three days with a gentle heat; strain, allow the fæces to subside; pour off the clear liquor, and evaporate to a proper consistence," L.) Dose, gr. v. to gr. xv.; this is a useless preparation, when we can obtain good

aloes.—*Pulvis Aloës cum Canella*, D. (Hepatic aloes, ℔j.; canella alba, ʒiij.; rub together to powder, and mix.) *Hiera picra;* formerly much used as an emmenagogue, but little employed now. Dose, gr. vi. to gr. xviij.—*Pulvis Aloës comp.*, D. L. (Hepatic (Socotrine, L.) aloes, ʒiss.; guaiacum resin, ʒi.; aromatic powder (compound cinnamon powder, L.), ʒss.; rub the aloes and guaiacum separately to powder, and mix in the aromatic (cinnamon, L.) powder.) A stimulating cathartic, not much used. Dose, gr. x. to ʒi.—*Pilulæ Aloës*, E. (Socotrine aloes and Castile soap, of each, equal parts; conserve of red roses, q. s.; beat into a proper pill mass.)—P. (Aloes, ʒiv.; soap, ʒvi.; oil of anise, gtt. viij.; sirup, q. s.; mix.) Dose, gr. x. to ʒss.—*Pilulæ Aloës comp.*, D. L. (Hepatic (Socotrine, L.) aloes (powdered, L.), ʒi.; extract of gentian, ʒss.; oil of caraway, min. xl.; simple sirup, a sufficiency; mix.) An excellent habitual purgative. Dose, gr. v. to gr. xv.—*Pilulæ Aloës cum Myrrhâ*, D. L. E. (Hepatic (Socotrine, L.; Socotrine or East Indian, E.) aloes (powdered, L.), ʒij. (4 parts, E.); saffron, ʒj. (1 part, E.); myrrh, ʒi. (2 parts, E.); sirup (conserve of red roses, E.), q. s.; beat to a proper mass.) *Rufus's Pills.* An excellent stimulating cathartic and emmenagogue. Dose, gr. x. to gr. xx.—*Pilulæ Aloës et Assafœtidæ*, E. (Socotrine or East Indian aloes, assafœtida, and Castile soap, equal parts; conserve of red roses, q. s.; beat to a proper mass.) Cathartic and antispasmodic. Dose, gr. x. to gr. xv.—*Pilulæ Aloës et Ferri*, E. (Sulphate of iron, 3 parts; Barbadoes aloes, 2 parts; aromatic powder, 6 parts; conserve of red roses, 8 parts; pulverize the aloes and sulphate of iron separately, and beat into a proper mass, which is to be divided into five-grain pills.) Tonic and cathartic, well adapted for chlorosis. Dose, one to three daily.—*Pilulæ ante cibum*, P. (Aloes, 6 parts; extract of cinchona, 3 parts; canella, 1 part; sirup of wormwood, q. s.; divide into four-grain pills.) One or two before dinner.—*Decoctum Aloës comp.*, D. L. *Decoctum Aloës*, E. (Extract of liquorice, ʒss. (ʒvij., L.); carbonate of potash, ʒij. (ʒi., L.); hepatic (Socotrine, L., or hepatic, E.) aloes, bruised (powdered, L.); myrrh, bruised (powdered, L.); and saffron, of each, ʒi. (ʒiss., L.); water, *by measure*, ℔j. (Oiss., L.); boil together down to fʒxij. (Oi., L.), strain, and add of the compound tincture of cardamoms, fʒiv. (fʒviij., L.) A mild cathartic, with tonic properties; acids, acidulous, and most metallic salts are incompatible in prescription with it. Dose, fʒss. to fʒij.—*Vinum Aloës*, D. L. (Socotrine aloes (rubbed to powder, L.), ʒiv. (ʒij., L.); canella bark (powdered, L.), ʒj. (ʒiv., L.); sherry wine, *by measure*, ℔iij. (Oij., L.); (proof spirit, *by measure*, ℔j., D.); macerate for 14 days, with frequent agitation, and strain.)—E. (Socotrine or East Indian aloes, ʒiss.; cardamom seeds, ground, and ginger, in coarse powder, of each, ʒiss.; sherry, Oij.; digest for seven days, and filter.) A warm purgative. Dose, fʒss. to fʒij.—*Tinctura Aloës*, D. L. E. (Socotrine (or East Indian, E.) aloes, powdered, ʒss. (ʒi., L. E.); extract of liquorice (dissolved in ʒviij. of boiling water, D.), ʒiss. (ʒiij., L. E.); proof (rectified, L. E.) spirit, *by measure*, ʒviij. (Oss., L.; fʒxij., E.); (water, Oiss., L.;

f℥xxviij., E.); digest for seven (fourteen, L.) days, and filter.) Cathartic and tonic. Dose, min. xxx. to f℥ss.—*Tinctura Aloës comp.*, D. L. *Tinctura Aloës et Myrrhæ*, E. (Socotrine (or East Indian, E.) aloes, powdered, ℥iij. (℥iv., L. E.); tincture of myrrh, *by measure*, ℔ij. (Oj.; and saffron, ℥ij., L. E.); macerate for fourteen (seven, E.) days, and filter.) Stomachic and cathartic. Dose, f℥ss. to f℥ij.—*Enema Aloës*, L. (Aloes, ℈ij.; carbonate of potash, gr. xv.; decoction of barley, Oss.; mix, and rub them together). A useful stimulating cathartic in the constipation of amenorrhœa; also employed for dislodging ascarides from the rectum.

Calomelas, E. Calomelas sublimatum, D. Hydrargyri chloridum, L. [Hydrargyri Chloridum Mite, U. S. P.] *Calomel; Sublimed Calomel; Chloride of Mercury.* (*Sub-chloride of Mercury*, Graham.)

Calomelas præcipitatum, D. *Calomel by precipitation.*

P. P.—Calomel, as obtained by sublimation, is sometimes in the form of a semitransparent, white, crystalline cake, the crystals being four-sided prisms; as usually met with, however, it is a heavy, snow-white, soft powder, inodorous and tasteless. Its sp. gr. is 6·5 (Graham).

C. P.—Calomel is a subchloride of mercury, being composed of 1 eq. of chlorine and 2 of mercury (Hg^2Cl.). It is completely insoluble in cold or boiling distilled water, in alcohol, or in ether. It acquires a yellow tinge by exposure to the air or by rubbing; exposed to heat, it becomes yellow, and volatilizes at a heat below redness; if under pressure, it fuses; with lime-water it gives a blackish precipitate, *sub-oxyde* of mercury.

Prep.—Calomelas sublimatum, D. "Persulphate of mercury, 25 parts; purified mercury, 17 parts; muriate of soda, dried, 10 parts; triturate together in an iron mortar the persulphate and the purified mercury, till the metallic globules shall have completely disappeared, then add the dried muriate of soda; mix well, and in a suitable vessel, with a gradually-increased heat, sublime into a receiver; reduce the sublimed mass to powder, and wash it with water, as long as the decanted liquor precipitates with solution of caustic potash; finally, dry the sublimed calomel."—Hydrargyri chloridum, L. Mercury, ℔iv.; sulphuric acid, ℔iij.; chloride of sodium, ℔iss.; distilled water, a sufficiency. Boil ℔ij. of the mercury with the sulphuric acid in a proper vessel, until the bipersulphate of mercury remains dry; rub this, when it is cold, with ℔ij. of mercury in an earthen mortar, that they may be perfectly mixed. Afterward add the chloride of sodium, and rub them together until globules are no longer visible; then sublime. Rub the sublimate to very fine powder, and wash it carefully with boiling distilled water, and dry it."—Calomelas, E. "Mercury, ℥viij.; sulphuric acid, f℥ij., f℥iij.; nitric acid, f℥ss.; muriate of soda, ℥iij.; mix the acids, add to them ℥iv. of the mercury, and dissolve it with the aid of a moderate heat; raise the heat so as to obtain a dry salt. Triturate this with the muriate of soda and the rest of the mercury, till the globules entirely disappear; heat the mixture by means of a sand-bath in a proper subliming apparatus. Reduce the sublimate to fine powder; wash the powder with boiling distilled water until the water ceases to precipitate with solution of hydriodate of potash; and then dry it."—Calomelas præcipitatum, D. "Purified mercury, 17 parts; diluted nitric acid, 15 parts; pour the acid upon the mercury, put into a glass vessel, and as soon as the mixture ceases to effervesce, digest with a gentle heat for 6 hours, frequently agitating; then increase the heat, that the liquor may boil for a short time, pour off from the residual mercury, and mix the liquid immediately with a solution of 7 parts of muriate of soda in 400 parts of boiling water; wash the precipitated powder with warm distilled water, as long as the poured-off liquor is affected by solution of caustic potash; finally, dry the powder."

Adulterations.—Calomel sometimes contains corrosive sublimate, which may be detected by agitation with sulphuric ether, pouring off the clear liquid and evaporating; if any sublimate be present, a crystalline powder is left, which becomes yellow with solution of caustic potash; this adulteration I have repeatedly detected in calomel, my attention having been always first directed to it by the irritation which it produced when administered to patients. One patient, to whom calomel, thus adulterated, was given in the form of powder, complained of a burning sensation in the back of the mouth and pharynx. The presence of any fixed white powder may be detected by applying a sufficient heat to sublime the calomel.

Th. E.—Calomel is seldom employed alone as a cathartic, but combined with other remedies of this class it is very frequently used, chiefly in consequence of its action on the secreting organs, stimulating the liver and intestinal glands to increased action. It is therefore peculiarly adapted for all diseases attended with functional derangement of the hepatic system, as well as for those cases in which there is determination of blood to the vessels of the brain, as in some forms of chronic headache, in threatened apoplexy, and paralysis, &c. Calomel is well suited as a cathartic for children, being tasteless, and in general producing copious alvine evacuations without pain; here, also, its combination with other purgatives, as jalap or scammony, will be attended with benefit. (See Special Stimulants.)

D. & M. of Adm.—In powder or pill, from gr. ij. to gr. vj. *Pilulæ catharticæ comp.*, U. S. (Calomel, ʒiij.; compound extract of colocynth, ʒss.; extract of jalap, in powder, ʒiij.; gamboge, in powder, gr. xl.; divide into 180 pills.) An excellent purgative, combining efficiency of action and comparative mildness with smallness of bulk. Each pill contains one grain of calomel. Dose, one or two pills.—*Pilulæ purgantes cum mercurio*, Den. (Calomel, four parts; extract of rhubarb, eight parts; resin of jalap, one part; oil of orange peel, q. s.; mix.) Dose, gr. ij. to gr. viij.

Incomp.—The alkalies, and their carbonates; chloride of sodium; lime-water; nitric and muriatic acids; iodide of potassium; sulphuretted hydrogen, and its combinations.

Cambogia (Siamensis), E. Cambogia, L. Gambogia, D. *Siam gamboge; Gamboge. Gum resin of Stalagmitis Cambogia*, D.—*S. Cambogioides*, L.—*From an unascertained plant inhabiting Siam, probably a species of Hebradendron*, E.

Cambogia (Zeylanica), E. *Ceylon gamboge; Gummy-resinous exudation of Hebradendron gambogioides.*—The plant which yields commercial or Siam gamboge is not yet ascertained, but, from the similarity of the two substances, is justly conjectured by the Edinburgh College to be a species of Hebradendron nearly allied to the Hebradendron gambogioides, from which plant Ceylon gamboge is procured. It belongs to the natural family *Guttiferæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—A handsome tree, of moderate size, with opposite, stalked leaves; uni-

sexual flowers, sessile and axillary; and a pleasant, saccharine fruit, about the size of a cherry, four-celled, each cell one-seeded.

P. U. & M. of Prep.—In Ceylon, gamboge is procured by making incisions into the bark of the tree or removing a piece of it, whence a viscid, bright-yellow juice exudes, which, when dried by exposure to the sun in shallow bowls, concretes into a hardened mass. In Siam, it is said to be obtained by breaking across the young branches and leaves, and collecting the juice that drops from them; be this as it may, the finer qualities are allowed to dry in the hollow stems of the bamboo-cane, or probably the juice is collected in them; and of late it has been more than once imported in the reeds.

P. P.—Commercial or Siam gamboge is generally met with in two forms: that of cylinders, sometimes hollow, more frequently solid, *Pipe gamboge;* and in irregularly-shaped masses, *Cake or Lump gamboge*. *Pipe gamboge* is of a rich, reddish-yellow colour, generally greenish and dusty externally; inodorous, tasteless at first, but soon causing a sense of acridity in the throat; brittle, with a smooth, glistening, conchoidal fracture. *Lump gamboge* is of a duller colour; its fracture is splintery, with scarcely any lustre, and it contains small fragments of wood, and many air-vesicles. *Ceylon gamboge* (for a specimen of which I am indebted to my friend Professor Christison) is not an article of English commerce; it is a coarse-looking substance, with many air-vesicles, of a dull, reddish-yellow colour, with many dark-brown spots.

C. P.—Gamboge is composed of resin (*Gambogic acid*), soluble gum, and a trace of woody fibre; the proportion of the resin, which is the active principle, varies, according to several of Christison's analyses, from 68 to 75 per cent. Gamboge, although not soluble in water, forms a perfect emulsion with it; it is almost entirely soluble in rectified spirit, and sulphuric ether completely dissolves out the resin, leaving the gum.

Adulterations.—The inferior varieties of gamboge are adulterated with some amylaceous matter; they also generally contain lignin: the former is detected by a cooled decoction becoming greenish on the addition of tincture of iodine; and the presence of the latter may be known by the fracture not being smooth and conchoidal.

Th. E.—Gamboge is a drastic cathartic, producing, even in small doses, frequent and copious watery evacuations, accompanied with much irritation of the stomach and bowels; in somewhat larger doses it occasions vomiting, and even sometimes inflammation of the intestinal canal, followed by death; one drachm has proved a fatal dose in more than one instance, the post-mortem appearances being ulceration and mortification of the intestines. In consequence of the distress caused even by medicinal doses of gamboge, it is seldom employed singly as a purgative, but is frequently added to other remedies of this class, either to augment their power, or to produce increased secretion from the alimentary canal. The combination of gamboge with an alkali, as with carbonate of potash, acts as a diuretic of much power, and such a preparation, under the name of *tincture of gamboge*, is highly praised by many Continental authors. The resin of gamboge, in somewhat smaller doses, acts precisely similar to the drug itself.

D. & M. of Adm.—In powder, pill, or emulsion, gr. ij. to gr. v., which may be repeated every five or six hours until it operates; it should be always finely powdered, and combined with some comparatively inert substance, as sugar, sulphate of potash, or cream of tartar.—*Pilulæ Cambogiæ comp.*, D. L. (Gamboge (powdered, L.), 3i.; aloes (hepatic, D.), 3iss.; ginger, powdered, 3ss.; soap, 3ij.; mix the powders together, add the soap, and (with the aid of treacle, D.), beat them into a mass.) A useful cathartic combination, operating effectually in doses of from gr. x. to gr. xx.—*Pilulæ Cambogiæ*, E. (Gamboge, East Indian or Barbadoes aloes, and aromatic powder, of each, one part; Castile soap, two parts; pulverize the aloes and gamboge separately, mix all the powders, add the soap, and, with the aid of sirup, beat into a proper pill mass.) Properties and dose same as last.—*Pilulæ Gambogiæ et Scammoniæ*, U. S. (Gamboge, ʒi.; scammony, ʒss.; nitre, 3i.; Castile soap, 3ij.; to be divided into 400 pills.) Dose, 1 to 3 pills. Useful in dropsical affections.—*Cathartic pills*, Dr. Paris. (Compound gamboge pill, and compound extract of colocynth, of each, gr. xv.; calomel, gr. x.; ginger sirup, q. s.; for 12 pills.) Dose, two daily, in habitual constipation, with a sluggish condition of the biliary organs.—*Tinctura Gambogiæ*, Voigtel. (Gamboge, powdered, ʒss.; carbonate of potash, ʒi.; brandy, fʒxij.; mix the powders intimately, add the spirit, and digest for four days with a gentle heat.) An excellent diuretic. Dose, f3ss. to f3i.

In cases of poisoning with gamboge, emollient and demulcent drinks should be given, and similar enemata administered; to be followed by small but repeated doses of opium, bloodletting, and the warm bath.

Cassiæ pulpa, E. Cassia, L. Cassia fistula, pulpa leguminis, D. *Cassia pulp. Pulp of the pods of Cassia fistula.*—This tree, originally a native of Africa, is now generally diffused over the East and West Indies; it belongs to the natural family *Leguminosæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A handsome tree, about thirty feet in height, with alternate, pinnate leaves; bright-yellow papilionaceous flowers in racemes; and cylindrical legumes or pods, about one or two feet long, of a blackish-brown colour.

P. U. & M. of Prep.—The pulp of the pods is the part employed in medicine. It is usually prepared by pouring boiling water on the bruised pods so as to wash out the pulp, pressing through a sieve, and evaporating the solution thus obtained to the consistence of a thick extract.

P. P.—Cassia pulp is of a reddish-black colour, and has a sweetish, mucilaginous taste, but no odour.

C. P.—It consists of sugar, gum, mucilaginous extractive, and colouring matter; no principle possessing purgative properties has as yet been discovered in it. It is almost entirely soluble in both alcohol and water.

Adulterations.—The pulp is not liable to adulteration; those pods only should be chosen which are heavy, and in which the seeds do not rattle.

Th. E.—Cassia pulp is a mild laxative, at present but seldom

employed; it is only adapted for febrile or inflammatory affections occurring in persons of delicate habits, or in children. Combined with manna, its cathartic properties are said to be much increased.

D. & M. of Adm.—Of the pulp, ʒss. to ʒiij.—*Electuarium Cassiæ*, D. *Confectio Cassiæ*, L. (Cassia pulp (recently expressed, D.), ℔ss.; manna, ʒij.; tamarind pulp, ʒi.; sirup of orange (of rose, L.), ℔ss.; bruise the manna, and dissolve it (with a gentle heat, D.) in the sirup; then add the pulp, and evaporate (slowly, D.) to a proper consistence.) Dose, ʒij. to ʒi.

Colchici cormus et semina, E. L. Colchicum autumnale, bulbus et semina, D. The *cormus* (*bulb*, D.) *and seeds of Colchicum autumnale. Meadow saffron.*—A common indigenous plant, belonging to the natural family *Melanthaceæ*, and to the Linnæan class and order *Hexandria Trigynia.*

B. C.—Cormus (improperly called bulb) fleshy, covered with a loose, brown membrane; giving origin in the middle of summer to a young cormus, which remains attached to the parent, grows rapidly, and sends up in autumn a naked white tube or flowering stem, terminating in a pale purple, crocus-like flower; the flower soon dies, and the seed-vessel which remains under ground springs up with the erect, broadly-lanceolate leaves, in the ensuing February or March.

P. U. & M. of Prep.—The cormus should be gathered about the end of July or beginning of August, before it has sent up the flowering stem; for medical purposes, it is cut transversely into thin slices, the dry coats having been previously removed. The slices are dried in a dark place, exposed to the air, with a heat not exceeding 170°. The seeds are gathered when ripe.

P. P.—Colchicum cormus is ovoid, about the size of a large walnut, compressed on one side, convex on the other; it may be distinguished from bulbous roots by being solid, and not composed of laminæ or scales. The dry slices are of a grayish-white colour, and firm. The seeds are small, rough, nearly round, and of a blackish-brown colour. Both seeds and cormus are odourless, but have a bitter, acrid taste.

C. P.—The cormus consists of fatty matter, a volatile acid, a peculiar uncrystallizable alkaloid, named *veratria* (which will be described under the head of General Stimulants), combined with gallic acid, starch, gum, inulin, and lignin (Pelletier and Caventou). The composition of the seeds is probably nearly the same. The active principles are extracted by water, alcohol, vinegar, and wine.

Not liable to adulteration; the dried slices should be firm, and notched only on one side; a fresh-scraped surface, moistened with vinegar, and tincture of guaiacum dropped on it, should be turned blue.

Th. E.—The most constant effect, indeed, in general, the only manifest one, of colchicum is purging, its cathartic operation being accompanied with great depression of the circulation and much debility. In large or frequently repeated doses, it produces nausea, vomiting, and hypercatharsis; and in small doses it is held by many to be diuretic, but this effect is uncertain. The principal diseases

in which colchicum has been employed are gout and rheumatism, for the former of which it has acquired the character of being a specific. Administered during a paroxysm of gout, it seldom fails to alleviate the pain and cut short the fit; but, so far from preventing a return of the attack, most practitioners agree that the employment of colchicum renders the system more predisposed to the disease, indeed, frequently gives rise to irregular or atonic gout. In acute rheumatism, the employment of colchicum should never be ventured on; but in some of the chronic forms of the disease, especially gouty rheumatism, it is often used in robust constitutions with benefit. Colchicum has also been employed as a cathartic and diuretic in dropsy, and as an antiphlogistic in febrile and inflammatory diseases; but in the present day its use is almost entirely confined to gout and rheumatism.

D. & M. OF ADM.—In the administration of colchicum or any of its preparations, we should always begin with small doses, and increase them very gradually, as no medicine varies more in its action on different persons, and, besides, the pharmaceutical preparations differ much in activity. It is seldom used in the form of powder: the dose is from gr. ij. to gr. viij.; the powder of the seeds should be preferred to that of the cormus, as being more uniform.—*Acetum Colchici*, D. L. E. (Fresh colchicum cormus, sliced, ℥i.; distilled vinegar, f℥xvj.; proof spirit, f℥i.; macerate the colchicum in the vinegar for three days in a covered glass vessel; press, strain, and set aside, that the dregs may subside; add the spirit to the clear liquor.)

[U. S. P.—Colchicum root, bruised, 2 oz.; distilled vinegar, 2 pints; alcohol, a fluid oz. Macerate the colchicum root with the vinegar in a close glass vessel seven days; express the liquor and set it aside, that the dregs may subside; lastly, pour off the clear liquor, and add the alcohol. Dilute acetic acid may be substituted for the distilled vinegar.]

This preparation is preferred by Scudamore to any other for gout; he recommends it to be combined with magnesia, to saturate the acid. It is, however, of very uncertain strength, in consequence of being frequently prepared with the dry bulb. Dose, f℥ss. to f℥ij., frequently repeated.—*Extractum Colchici* (*cormi*), L. (Fresh colchicum cormus, ℔j.; bruise, with a little water, in a stone mortar; press out the juice and evaporate it, unstrained, to a proper consistence.) Dose, gr. j., every three or four hours; not much used.—*Extractum Colchici* (*cormi*) *aceticum*, L. E. (Fresh colchicum cormus, ℔j.; acetic (pyroligneous, E.) acid, f℥iij.; bruise the cormus, gradually adding the acid; express the juice, and evaporate it in a porcelain vessel not glazed with lead (over the vapour bath, E.) to a due consistence.) Dose, gr. i. to gr. iij., two or three times a day. Made into pill with an equal quantity of extract of colchicum, it forms an excellent cathartic in gouty and rheumatic affections.—*Oxymel Colchici* (*cormi*), D. (Fresh colchicum bulb, cut into thin slices, ℥i.; distilled vinegar, f℥xvj.; clarified honey, *by weight*, ℔ij.; macerate the colchicum with the vin-

egar in a glass vessel for two days; express strongly, strain, and add the honey; and boil down the mixture to the consistence of a sirup, frequently stirring with a wooden spatula.) Dose, ʒi., gradually increased to ʒij., twice a day; not much used.—*Tinctura Colchici* (*seminum*), D. L. E. (Colchicum seeds (bruised, L.; ground finely in a coffee-mill, E.), ʒij. (ʒv., L. E.); proof spirit, fʒxvi. (Oij., L. E.); macerate for 14 days, and strain, D. L.: "to be prepared like tincture of cinchona, and percolation is much more convenient and speedy than digestion," E.) Dose, fʒi., gradually increased to fʒij., twice daily.—*Tinctura Colchici comp.*, L. (Colchicum seeds, bruised, ʒv.; aromatic spirit of ammonia, Oij.; macerate for 14 days, and strain.) Dose, min. xx. to min. xxx., three times a day; seldom used.—*Vinum Colchici*, L. E. (Colchicum cormus, dried and sliced, ʒviij.; sherry wine, Oij.; digest for 14 (7, E.) days (express strongly the residuum, E.), and strain.) It may be prepared with the seeds (*Vinum seminum colchici*), using the same proportion: a preferable preparation, as being more uniform. Dose, fʒss., gradually increased to fʒij., three or four times a day.—*Succus Colchici* is prepared by expressing the juice from the fresh cormi, allowing it to stand 48 hours, to deposite the fecula, and adding to the clear liquor a fifth of rectified spirit. This is a most active preparation, and keeps well. Dose, min. v. to min. xx.

In cases of poisoning with colchicum, emetics, followed by demulcent drinks, should be immediately administered; and if coma be present, brandy, ammonia, coffee, and other powerful stimulants should be given. The vegetable astringents have been recommended as antidotes, tannic acid forming an insoluble precipitate with veratria.

Colocynthis, D. L. E. *Colocynth. Pulp* (*dried*, L.) *of the fruit of Cucumis colocynthis.*—This plant, the bitter cucumber, is a native of several parts of Asia and Africa, and is cultivated in Greece and Spain; it belongs to the natural family *Cucurbitaceæ*, and to the Linnæan class and order *Monœcia Syngenesia.*

B. C.—A creeping, procumbent annual; leaves ovato-cordate; flowers yellow, axillary, solitary; fruit (*pepo*) globose, about the size of an orange, yellow when ripe, with a thin, solid rind.

P. U. & M. of Prep.—The fruit; it is gathered when ripe, peeled and dried. In some countries it is dried without being peeled.

P. P.—The pulp of the dried fruit, which is the officinal part, is of a pale yellowish-white colour; it is without odour, but has an intensely bitter, nauseous taste; it is light, spongy, porous, and so tough as to be with difficulty reduced to powder. The unpeeled fruit (*Mogadore Colocynth*) is imported in small quantities into England, but is only used by druggists in show-bottles.

C. P.—Colocynth pulp contains a peculiar bitter matter, which has been named *Colocynthin*, and on which its purgative property is supposed to depend, resin, pectin, gummy matter, and various salts. It yields its active properties to both water and alcohol.

Adulterations.—Colocynth pulp is not liable to adulteration; but if it have a grayish or brownish colour, it is of inferior quality.

Th. E.—Colocynth operates as a stimulant to the intestinal canal, its influence being specially directed to the large intestines, promoting both their secretion and exhalation, as well as increasing their vermicular motion; in large doses, it is a dangerous poison, producing intestinal inflammation. In consequence of the drastic properties it possesses when administered alone, it is always combined with other cathartics, in order to mitigate its action, as in the several pharmacopœial preparations, and is thus exhibited with much advantage in habitual constipation, in passive dropsies, in alvine obstruction, and as a revulsant in determination of blood to the brain. It is also said to possess diuretic properties.

D. & M. or Adm.—In powder (now seldom used), gr. ij. to gr. viij., mixed with some inert powder.—*Extractum Colocynthidis* (*simplex*, D.), D. L. E. (Colocynth pulp, ℔j.; water (distilled, L.), cong. j. (cong. ij., L. E.); boil down to ℔iv., *by measure* (for six hours gently, replacing the water occasionally, L. E.), strain while hot, and evaporate to a proper consistence.) A bad preparation, as it does not keep well; but seldom used; dose, gr. v. to ʒi.—*Extractum Colocynthidis comp.*, D. L. (Colocynth pulp, cut small, ʒvj.; hepatic aloes (purified extract of aloes, L.), ʒxij.; scammony, powdered, ʒiv.; cardamom seeds, powdered, ʒi.; (hard, D.) soap, ʒiij.; proof spirit, cong. j.; macerate the colocynth in the spirit for four days with a gentle heat; add the aloes, scammony, and soap to the (expressed, D.) and strained liquor; then evaporate to a proper consistence (for making pills, D.), the cardamom seeds being mixed in towards the end.) One of the most generally employed, and safest cathartics in the whole Materia Medica, and if the various substances of which it consists be pure, equally efficacious as safe. Dose, gr. v. to gr. xv.—*Pilulæ Colocynthidis*, E. (Socotrine or Indian aloes, and scammony, of each, 8 parts; colocynth, 4 parts; sulphate of potash and oil of cloves, of each, 1 part; rectified spirit, a sufficiency; pulverize the aloes, scammony, and sulphate together, mix the colocynth in fine powder, add the oil, and, with the aid of a little spirit, beat into a proper pill mass.) *Pilulæ Colocynthidis comp.*, D. (Hepatic aloes and scammony, of each, ʒi.; colocynth pulp, ʒss.; Castile soap, ʒij.; sulphate of potash and oil of cloves, of each, ʒi.; process the same as in the *Ed. Ph.*, the soap, with a little treacle, being employed instead of the spirit.) Both these preparations resemble in their operation the compound extract, to which I think they are to be preferred; the dose is the same.—*Pilulæ Colocynthidis et Hyosciami*, E. (Colocynth pill mass, 2 parts; extract of hyosciamus, 1 part; beat well together, and divide into five-grain pills.) An excellent preparation, peculiarly adapted for persons with irritable bowels. Dose, 1 to 3 pills.—*Enema Colocynthidis*, L. (Compound extract of colocynth, ʒij.; soft soap, ʒi.; water, Oj.; mix and rub together.) An efficient enema in obstinate constipation and colic.—*Tinctura Colocynthidis*, Pr. Pol. F. B. (Colocynth, ʒi.; star anise, ʒi.; rectified spirit, ʒxiv.; digest for three days, and filter.) Dose, min. x. to min. xv., in a mixture.—*Decoctum Colocynthidis*, B. (Colo-

cynth, ʒi.; boiling water, ℥vj.; boil for ten minutes, strain, and add sulphuric ether, ʒi.; sirup of orange peel, ℥i.) Both these preparations are diuretic; dose, f℥ss., two or three times daily.

CROTONIS TIGLII, OLEUM, D. TIGLII OLEUM, L. CROTONIS OLEUM, E. *Croton oil. Expressed oil of the seeds of Croton tiglium.*—A native of the continent of India, the Molucca Islands, and Ceylon; belonging to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—A moderate-sized tree, with a smooth bark; leaves oblongo-ovate, acuminate, with two flat, round glands at the base; flowers white, in terminal racemes; fruit ovate and triangular, somewhat bigger than a hazelnut, three-celled, each cell one-seeded.

P. P.—Croton seeds (*Grana tiglii*) are of an irregularly-oval shape, about 6 lines long, 2½ lines thick, and 3 lines broad; they are of a grayish-brown colour, and marked with the ramifications of the raphé; they contain, internally, a pale yellowish-white albumen, which envelops the embryo with its large, leafy cotyledons. From the kernels croton oil is obtained by pressure; it is thicker than castor oil, of a pale amber colour, has a feeble, sickly odour, and an intensely acrid taste. The kernels yield about half their weight of oil.

C. P.—Croton oil consists of a peculiar acid named *Crotonic acid*, dissolved in a bland fixed oil; it is to the acid that the properties of the oil are due. Croton oil is insoluble in alcohol, even with the aid of heat, but is very soluble in sulphuric ether, and in the fixed and volatile oils.

Adulterations.—Castor oil is the only substance employed to adulterate croton oil; it may readily be detected by its solubility in alcohol, the test adopted by the Edinburgh College: "when agitated with its own volume of pure alcohol and gently heated, croton oil separates, on standing, without having undergone any apparent diminution."

TH. E.—Croton oil is an acrid cathartic, operating speedily, and producing frequent watery evacuations; it does not in general give rise to nausea or griping, and is, consequently, to be preferred in most cases to other cathartics of equal power. It is used chiefly in obstinate constipation, in comatose affections, and in dropsy; in the various forms of convulsive and neuralgic diseases, it is a most valuable cathartic; given in frequently-repeated small doses in such affections, I have in several cases found it a complete specific. Croton oil should not be employed in extreme debility, or where there is any tendency to inflammation in the digestive organs.

D. & M. OF ADM.—Min. j. or min. ij. In cases where the patient is unable or unwilling to swallow, it may be dropped on the tongue; or dissolved in ether, it may be rubbed on the abdomen. If it can be avoided, however, it should never be administered in a fluid form, as it causes a most disagreeable acrid impression in the back of the throat; it may be made into pill with conserve of roses or liquorice powder, or one or two minims may be added to any

of the common purgative pill masses, and thus given in divided doses until it operates.—*Sapo Crotonis.* (Croton oil, 2 parts; liquid caustic soda, one part.) Dose, gr. i. to gr. iij.

Elaterium, D. L. E. *Elaterium. The fruit, fecula, and leaves,* D.; *the fresh fruit,* L.; *the feculence of the juice of the fruit,* E., *of Momordica Elaterium.*—The wild or squirting cucumber is a native of Greece and other parts of the South of Europe, and is cultivated in the British Isles; it belongs to the natural family *Cucurbitaceæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—An annual, trailing plant, with a thick branching stem about two feet in length; grayish, rugose leaves, and yellow, axillary flowers; fruit (*pepo*) is about an inch and a half long, elliptical, green, covered with soft prickles; on quitting the foot-stalk when ripe, it suddenly, in consequence of the elastic structure of its parietes, discharges with considerable force many brown seeds and a slimy juice through the aperture at its base.

P. U. & M. of Prep.—The juice of the cut fruit, when ripe (not quite ripe, *Edin.*), is expressed gently through a fine hair-sieve, allowed to rest till it becomes pretty clear, the supernatant liquid rejected, and the feculence dried with a gentle heat; this constitutes the *Extractum Elaterii*, D. L.; *Elaterium*, E.

P. P.—Elaterium is in thin, flat, or slightly-curled pieces or fragments, light and friable; of a pale, greenish-gray colour, with a very faint odour, but an intensely acrid and bitter taste; the pieces generally bear on the surface an impression of the linen on which they have been dried. An inferior quality, sometimes met with, is of a brownish or dark-green colour, very hard, and broken with difficulty.

C. P.—According to Hennell's analysis, elaterium consists of a crystallizable substance (*Elaterin*), green resin, starch, woody fibre, and saline matters. Elaterin, the active principle of the drug, may be obtained by exhausting elaterium thoroughly with boiling rectified spirit, concentrating this solution so long as no separation takes place, and then pouring it, while hot, into a weak boiling solution of potash; on cooling, the elaterin crystallizes in minute, colourless, satiny crystals: the quantity obtained varies, in proportion to the quality of the drug employed, from 5 to 26 per cent.

Adulterations.—Elaterium is seldom expressly adulterated, but it varies much in strength, owing, probably, to the different degrees of care bestowed on its preparation; the best test for ascertaining its goodness is the process given above for obtaining its active principle: the quantity of *elaterin* thus procured "should weigh from a seventh to a fourth of the elaterium," *Ed. Ph.*

Th. E.—Elaterium is a most powerful drastic cathartic, even in minute doses, $\frac{1}{10}$ of a grain sometimes producing considerable purging, and $\frac{1}{4}$ of a grain, in dropsical cases, generally causing a discharge of several pints of fluid by the bowels; its operation is characterized by nausea, sometimes vomiting, and considerable depression of the circulatory and nervous systems. The chief use of elaterium is in passive dropsies, especially ascites and hydrothorax, when it is deemed advisable to attempt the removal of the ef-

fused fluid by the bowels. It will also be generally found that diuresis is more freely established after the operation of elaterium. The administration of elaterium requires the greatest caution in debilitated habits.

D. & M. of Adm.—$\frac{1}{16}$ to $\frac{1}{4}$ of a grain in pill (it should be always given at first in small doses), in combination with some tonic extract, as of gentian or chamomile. *Pulvis Elaterii comp.*, Guy's H. (Elaterium, gr. iv.; bitartrate of potassa, ℈v.; ginger, ℈ij.; mix; thirty grains contain one gr. of elaterium.) Dose, gr. v. to gr. x.—*Tinctura Elaterii.* (Elaterium, gr. viij.; rectified spirit, f℥viij.; dissolve.) Dose, f℥ss. to f℥ij.—*Solutio Elaterinæ*, Morries Stirling. (Elaterin, gr. j.; rectified spirit, f℥i.; nitric acid, min. iv.; dissolve.) Dose, min. xxx. or min. xl.

In poisoning with elaterium, the same treatment should be followed as in poisoning with gamboge.

Euphorbia Lathyris. *Caper spurge.*—An indigenous biennial, belonging to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monandria.* It is not officinal in any of the British Pharmacopœias, but an oil obtained from the seeds has been introduced into the Paris Codex, as a cheap and efficient substitute for croton oil; it is obtained by simple pressure from the ripe seeds; it resembles castor oil in appearance, but is not quite so dense; it has no odour, is not acrid, nor has it an unpleasant flavour. Calderini, an Italian physician, has used it extensively; he says that its effect is certain and prompt, and that it may be considered as a mild cathartic, not producing either vomiting, colic, or tenesmus. It is adapted for all cases in which it is desirable to purge gently but effectually, and with a small dose of medicine. This oil is worthy of more observation than has been hitherto bestowed on it, as being likely to afford us an excellent indigenous cathartic. The dose is from min. iv. to min. viij.; it may be administered in sirup.

Helleborus, L. E. [and U. S. P.] Helleborus niger, radix, D. *Root of Helleborus niger; Black Hellebore, or Christmas rose*, D. E. *Root of Helleborus officinalis, Oriental or Officinal Hellebore*, L.—The black hellebore, the Melampodium of the ancients, a native of the middle and southern parts of Europe, belongs to the natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Polygynia.*

B. C.—Herbaceous; leaves all radical, pedatisect; scape leafless, one to two flowered; flowers large, white.

P. U. & M. of Prep.—The radicles; they should be dug up in February, after the plant is done flowering, and dried quickly.

P. P.—As met with in the shops, the root consists of two parts, a black root-stock, and numerous undivided fibres or radicals which arise from it; the latter are cylindrical, about the thickness of a crow-quill, brownish-black externally, whitish within, brittle; they have a faint, unpleasant odour, and a somewhat acrid, bitter taste, but the acridity is much lost by drying.

C. P.—Black hellebore root contains a volatile oil, an acrid, volatile acid, and other unimportant substances. Both water and alcohol extract its active properties, which probably depend on the volatile acid.

Adulterations.—Various other roots are substituted for, or intermixed with, black hellebore root on the Continent, but, in consequence of the limited employment of the drug, the fraud is not practised in this country. The root should be constantly renewed, as it loses its medicinal properties by keeping.

Th. E.—This substance is classed among the vegetable irritant poisons, but in medicinal doses it operates as a drastic cathartic; and although little esteemed in modern practice, it was highly prized by the ancients, as a purgative in cerebral and nervous disorders, and in dropsy; it was also said to possess emmenagogue and anthelmintic properties.

D. & M. of Adm.—In powder, gr. iij. to gr. xij. *Tinctura Hellebori*, D. L. (Black hellebore root, in coarse powder (bruised, L.), ʒiv. (ʒv., L.); proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 7 (14, L.) days, and strain.) Dose, f3i. to f3ij.

Hydrargyrum cum creta, D. L. E. [and U. S. P.]—*Mercury with chalk.*

P. P.—A grayish, heavy, insoluble powder; void of odour, but having an astringent, metallic taste.

C. P.—According to the recent investigations of many celebrated chemists, this preparation appears to consist of metallic mercury in a state of minute division, suboxyde of mercury, and carbonate of lime, combined mechanically; but in what proportion the metal and oxyde exist has not yet been ascertained. On the addition of the stronger acids to the powder, effervescence takes place; and by exposure to heat, the mercury is volatilized.

Prep.—*Dub.* "Take of purified mercury and manna, of each, two parts; prepared chalk, one part; triturate the mercury and manna in an earthenware mortar, adding a few drops of water, to give the mass the consistence of sirup; as soon as the globules disappear, add an eighth of the chalk; all being well mixed, add 16 parts of water, agitate, and after resting, when the sediment falls, pour off the liquor; let the washing be repeated again, and a third time, so as to remove all the manna; mix with the moist powder the rest of the chalk, and dry on blotting paper." *Lond., Edin.* "Triturate together mercury, ʒiij., and prepared chalk, ʒv., till the globules disappear." In the Dublin formula, the manna is employed to effect the minute division and oxydation of the mercury.

Th. E.—A gentle cathartic and alterative, peculiarly adapted for infancy and childhood, promoting and improving the secretions of the liver, pancreas, and intestines. In combination with rhubarb, it is employed with much benefit in the diarrhœa of children when the stools are clay-coloured, and when there is acidity of the primæ viæ. Prescribed with dry carbonate of soda, it is our most useful alterative in the cutaneous affections of infancy and childhood.

D. & M. of Adm.—In powder, gr. ij. to gr. v., for children; it is seldom prescribed for adults; the dose would be from gr. x. to 3ss.

Incomp.—The mineral acids; acetic acid; alum: and all sulphates.

Hydrargyrum cum magnesia, D. *Mercury with Magnesia.*—Prepared in a similar manner to the last, carbonate of magnesia being employed instead of prepared chalk. Its properties would appear to be nearly similar, but at present it is scarcely ever used.

Hydrargyri pilulæ, D. L. E. *Pills of Mercury. Blue pill.*

P. P.—A soft pill mass, of a dark-blue colour.

C. P.—This preparation, like the last two, probably consists of metallic mercury in a state of minute division combined with the suboxyde of mercury. Three grains of the pill contain one grain of mercury.

Prep.—"By triturating in a mortar until the globules disappear, two parts of purified mercury, and three parts of conserve of red roses, and then adding one part of extract of liquorice (of liquorice root, L. E.), reduced to fine powder, and beating together until they are all incorporated."

Adulterations.—If the pill mass be prepared with conserve of roses to which sulphuric acid had been added, as is sometimes done to brighten its colour, it will contain subsulphate of mercury, which possesses very irritating properties. It may be detected by triturating the mass with boiling water, and adding to the filtered liquor solution of nitrate of baryta; if any sulphate be present, a white precipitate, insoluble in nitric acid, will be produced.

Th. E.—Although blue pill is most generally employed to produce the specific effect of the mercurial preparations, in full doses it operates as a cathartic. In consequence of its general alterative powers, and the peculiar property it possesses of improving and stimulating the biliary secretions, it is commonly prescribed in combination with the different cathartic pill masses, particularly the compound extract of colocynth. Thus combined, taken at night, and followed by an active purgative draught in the morning, it is found especially useful in the milder forms of derangement of the biliary organs.

D. & M. of Adm.—Given alone, as a cathartic, gr. xij. to gr. xx.; combined with other purgatives, gr. v. to gr. viij.

Jalapa, D. L. E. *Root of Convolvulus jalapa*, D.—*of Ipomœa jalapa*, L.—*of Ipomœa purga*, E. *Jalap.*—The officinal jalap root is now well known to be obtained from the plant indicated by the London and Edinburgh Colleges under different specific names, and not from that adopted by the Dublin College. It is a native of Mexico and Vera Cruz, and belongs to the natural family *Convolvulaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Roots tuberous, incrassated; stems herbaceous, climbing; leaves greenish, alternate, petioled, cordiform; flowers large, one to three, on axillary peduncles; corolla large, campanulate, white, with a reddish-purple centre.

P. U. & M. of Prep.—The root; it is dug up at the time the young shoots begin to appear, and dried by exposure to the air, or suspended in net bags over a fire.

P. P.—Jalap root is met with in commerce in pieces, varying much both in size and form. The entire tubers are ovoid, from the size of a nut to that of an orange, generally incised more or

less deeply, and in different directions; externally rugose, compact, dark brown; whitish or yellowish within, marked with concentric zones. The flat pieces are merely transverse slices of the entire tubers. The fracture of jalap root is marbled and compact, presenting many brilliant points (resin); the odour is faint, but very nauseating; the taste nauseous and acrid. It is pulverized with difficulty.

C. P.—Jalap is composed of hard and soft resin, bitter extractive, gummy extractive, albumen, uncrystallizable sugar, gum, mucilage, starch, and colouring matter. The resin, its active principle, exists in the proportion of from ten to fourteen per cent.; it is soluble in alcohol, while water only dissolves the non-cathartic components of the root. The starch is often eaten by insects; such pieces are said to be worm-eaten; they are the most active, as they contain, in proportion to their weight, more resin.

Adulterations.—Jalap root, as met with in English commerce, can scarcely be said to be adulterated; at one time slices of white Bryony root were mixed with it, but the white colour and intense bitterness of the spurious root rendered the fraud easy of detection. On the Continent many forms of spurious or counterfeit jalaps are met with, mixed with the true root; they may, for the most part, be distinguished by being very rugose, of a reddish or rose colour internally, not compact, with a faint odour, and almost insipid.

Th. E.—Jalap is a powerful cathartic, operating principally upon the small intestines; administered in too large a dose, it causes violent hypercatharsis and inflammation. In medicinal doses it is certain in its operation, increasing the peristaltic action, and promoting the secretions and exhalations of the alimentary canal without causing any irritation; consequently, it is frequently and beneficially prescribed for children. Its chief use as a cathartic is in simple constipation, without inflammation, in ascites, in scrofulous affections, and in verminous diseases; in the two latter, it is beneficially combined with calomel; in dropsy, with cream of tartar. It sometimes produces salivation, if its use be long persisted in.

D. & M. of Adm.—In powder, gr. x. to gr. xxx., for an adult; gr. ij. to gr. viij., for children; it may be given made into a bolus, or suspended in water, or any simple decoction.—*Pulvis Jalapæ comp.*, D. L. E. (Jalap powder, ℔ss. (℥iij., L.; ℥i., E.); bitartrate of potash, ℔j. (℥vi., L.; ℥ij., E.); (ginger, ʒij., L.); rub to very fine powder, and mix.) Hydragogue cathartic; dose, ʒss. to ʒiss.—*Anthelmintic powder*, Paris, H. (Jalap, gr. xxx.; rhubarb, gr. vi.; calomel, gr. ij.; mix.) Dose, gr. xij. to ℈i.—*Extractum Jalapæ*, D. L. (Jalap root, bruised (powdered, L.), ℔i. (℔iiss., L.); rectified spirit, *by measure*, ℔iv. (cong. j., L.); water (distilled, L.), cong. j. (cong. ij., L.); macerate in the spirit for four days, and pour off the tincture; boil down the residue in the water to ℔ij. (cong. ss., L.); then strain the tincture and the decoction separately, evaporate the latter, and distil the former until each thickens; lastly, mix the extract with the resin, and evaporate with a water-bath to a proper consistence: "this extract should be kept *soft* to form

pills, and *hard* for powdering," L.) Dose, gr. x. to ℈i.—*Extractum sive Resina Jalapæ*, E. (Take any convenient quantity of jalap in moderately fine powder, mix it thoroughly with enough of rectified spirit to moisten it well, put it, in 12 hours, into a percolator, and exhaust the powder with rectified spirit; distil off the greater part of the spirit, and concentrate the residuum over the vapour-bath to a due consistence.) This is the impure resin; the dose is from gr. iij. to gr. x.; it should be given in a state of minute division, for which purpose it may be rubbed with sugar or some mild powder, or made into an emulsion with milk, sugar, and almonds. — *Sapo Jalapinus*, Pr. (Castile soap and jalap resin, equal parts; rectified spirit, q. s.; dissolve, and evaporate with a gentle heat to the consistence of a conserve.) Dose, gr. xij. to ℈i., for adults; gr. iij. to gr. vj., for children.—*Tinctura Jalapæ*, D. L. E. (Jalap, in coarse powder (bruised, L.), ℥viij. (℥x., L.; ℥vij., E.); proof spirit, *by measure*, ℔ij. (Oij., L. E.); macerate for 7 (14, D. L.) days, and strain; "or may be prepared by percolation," E.) Dose, f℥j. to f℥iv.—*Sirup of Jalap*, P. (Jalap, 20 parts; coriander and fennel seeds, of each 1 part; water, 200 parts; sugar, 400 parts; mix. Dose, f℥ij. to f℥iv.

[Juglans cinerea, U. S. P. (*Butternut. Monœcia Polyandria. Indigenous.*)

P. & C. P. — The inner bark fibrous; bitter and slightly acrid taste, but little odour; yields all its virtues to boiling water.

Th. E.—Cathartic, analogous in its action to rhubarb, and often useful in habitual constipation.

D. & M. of Adm.—The powder made of the inner bark of the root is given in doses of 10 to 30 grs., as a cathartic, or 5 grs., repeated, as a laxative. It is usual to combine it with calomel for purgative purposes. — *Extractum Juglandis*, U. S. P. Take a pound of the inner bark of the root, reduced to coarse powder, pour upon it a pint of water, let it stand for 24 hours, and treat it by displacement, pouring more water upon it, until it passes but slightly impregnated with the root. Then heat the filtered liquid to the boiling point, strain, and evaporate to the proper consistence. Dose, 5 grs. to a scruple.]

Linum catharticum, E. *Purging flax.*—A slender indigenous annual from two to six inches high, with small white flowers, drooping before expansion. It belongs to the natural family *Linaceæ*, and to the Linnæan class and order *Pentandria Monogynia*. The whole herb is officinal; it is void of odour, but has an intensely bitter taste. It was formerly held in high esteem as a cathartic and diuretic; at present it is never used in regular practice, and has only been retained in the Edinburgh Pharmacopœia on the authority of Dr. Christison, as a useful indigenous cathartic, in doses of a drachm of the powder, or an infusion of two or three drachms of the herb.

Magnesia. *Magnesia* (described in the division Antacids), given in full doses, operates as a gentle cathartic; its effect, however, being by no means uniform or certain, depending, probably, on the quantity of free acid in the stomach, by union with which it forms soluble magnesian salts. It does not increase the secretions of the intestines, but, by stimulating their muscular fibres, causes the evacuation of their contents. Magnesia is very generally employed as a purgative in infantile diseases, and by females and persons of a delicate habit of body; it is most usually combined with rhubarb, a combination frequently employed, and with much benefit in the early stages of diarrhœa, particularly when dependant on irritation or acidity of the primæ viæ. Magnesia, when taken for a long period, has in some instances accumulated to a great extent, and even formed concretions in the bowels. When it is thought advisable, therefore, to continue its use for any time, it will be necessary occasionally to administer an active cathartic. Dose, ℈i. to ʒi., for adults; gr. ij. to gr. x., for children.

Magnesiæ carbonas, *Carbonate of Magnesia* (described in the division Antacids), is a still milder cathartic; it is employed in the same cases, but is less frequently used than magnesia, in consequence of its producing flatulence from the disengagement of carbonic acid in the stomach. Dose, ʒi. to ʒij., for adults; gr. x. to ℈i., for children. A mildly laxative, effervescing draught may be prepared with a drachm of carbonate of magnesia, the juice of one lemon, and a wine-glassful of water.

Magnesiæ sulphas, D. L. E. *Sulphate of Magnesia. Epsom Salts.*—Magnesiæ sulphas purum, D. *Pure Sulphate of Magnesia.*

P. P.—Usually met with in small acicular crystals, transparent and colourless; inodorous; with an extremely bitter, disagreeable taste. By slow crystallization, tolerably large crystals are readily obtained; their form is the four-sided rhombic prism with reversed dihedral summits, or four-sided pyramids. Sp. gr., 1·66.

C. P.—It is composed of 1 eq. of magnesia, 1 of acid, and 7 of water ($MgO, SO^3, HO+6\,HO$). It is permanent in the air, but in a slightly-increased temperature effloresces, losing 6 eq. of water at a temperature considerably under 300°, first fusing in its water of crystallization; if the temperature be raised still higher it becomes anhydrous, and undergoes the igneous fusion, but is not decomposed. It dissolves in its own weight of water at 60°, and in three fourths of its weight of boiling water. It is insoluble in alcohol.

Prep.—An article of the Materia Medica; it was formerly prepared by evaporating the waters of the Epsom springs; at present a variety of processes are followed by different manufacturers, which it would be out of place here to enter into any account of. The process of the *Dub. Ph.* for preparing the pure salt, as it is there termed, is as follows: "Take of commercial sulphuric acid, 25 parts; water, 100 parts; carbonate of magnesia, 24 parts, or a sufficiency; to the acid and water mixed, add gradually the carbonate of magnesia; lastly, evaporate the filtered liquor, that crystals may form on cooling."

Adulterations.—At present this salt is met with in a state of great purity; sometimes, however, when prepared from bittern, it

contains chloride of magnesium, which, being very deliquescent, is readily recognised. On the Continent in the present day, and formerly also in Ireland, crystals of sulphate of soda, which is a much cheaper salt, are fraudulently mixed with those of sulphate of magnesia; the sophistication is best detected by the test of the *Ed. Ph.*, which is intended to show that the full proportion of magnesia is present: "ten grs. dissolved in f℥i. of water, and treated with solution of carbonate of ammonia, are not entirely precipitated by 280 minims of solution of phosphate of soda (1 of salt to 20 water)."

Th. E.—Sulphate of magnesia is a refrigerant cathartic, operating mildly, but effectually, augmenting the secretions, and promoting the peristaltic action of the intestinal canal; the evacuations are watery, and are not accompanied with either nausea or griping. It is, consequently, more generally employed at present than, perhaps, any other medicine of this class; it has also the advantage of great cheapness. This salt is peculiarly adapted for all forms of febrile and inflammatory affections, especially when accompanied by constipation. In short, there are but few diseases in which cathartics are indicated that it may not be employed with benefit. Sulphate of magnesia forms the active ingredient in many mineral waters.

D. & M. of Adm.—℥ij. to ℥j., dissolved in seven or eight times its weight of water. Its cathartic properties are promoted by dilution, therefore a smaller dose than usual will suffice, if dissolved in a large quantity of water; tincture of some aromatic bitter, as of cascarilla, columbo, orange peel, &c., is added with advantage to the solution, to conceal its nauseous taste; this is best done, however, by the addition of ten or twelve minims of dilute sulphuric acid, or by administering the salt in the acid infusion of roses; an elegant and beneficial form in febrile diseases.—*Pulvis Salinus comp.*, D. E. (Pure muriate of soda and sulphate of magnesia, of each, ℥iv.; sulphate of potash, ℥iij.; dry the salts with a gentle heat, and pulverize them separately; then triturate them well together, and keep in a well-closed vessel.) Dose, ℥ij. to ℥ss. dissolved in Oss. of water. In the preparation of this powder, instead of the sulphate of potash, I have employed ℥iv. of sulphate of soda, and found the resulting compound a more effectual cathartic in smaller doses, ℥i. dissolved in a half pint of water, and taken in the morning before breakfast, operating freely, and with perfect safety.—*Enema Catharticum*, D. (Manna, ℥i.; dissolve in ten fluid ounces of decoction of chamomile, and add olive oil, ℥i.; and sulphate of magnesia, ℥ss.)—E. (Olive oil, ℥i.; sulphate of magnesia, ℥ss.; sugar, ℥i.; senna, ℥ss.; boiling water, f℥xvi.; infuse the senna in the water for an hour; then dissolve the salt and the sugar, and add the oil.) A useful cathartic enema for general purposes.

Incomp.—The alkalies, and their carbonates; lime-water; chloride of calcium; the acetates of lead; and nitrate of silver. The bicarbonates of the alkalies are not incompatible with sulphate of magnesia, unless at the temperature of boiling water.

Manna, D. L. E. *Concrete juice of Fraxinus ornus*, D. *Of Ornus Europæa*, L. *Sweet concrete exudation, probably from several species of Fraxinus and Ornus*, E.—The precise species of the genera Fraxinus and Ornus from which manna is obtained are not yet well established; that indicated by the Dub. and Lond. Colleges under different names is a native of the South of Europe, chiefly of Sicily and the south of Italy. It belongs to the natural family *Oleaceæ*, and to the Linnæan class and order *Diandria Monogynia*.

B. C.—A small tree; leaves opposite, pinnate; panicles large, many flowered; flowers small, polygamous, white; the whole tree resembles much in appearance the common ash of our climate.

P. U. & M. of Prep.—The juice of the stem, which either exudes spontaneously from fissures in the bark, through punctures made by insects, or more usually from incisions made expressly with a hooked knife. It rapidly concretes on the tree, and is then removed by the hand.

P. P.—Two sorts are commonly met with in the shops: 1st. Flake manna, *Manna cannellata;* it occurs in stalactiform pieces, from one to six inches in length, and one or two inches in width, uneven, rugged, porous, and friable; of a dull yellowish-white colour; presenting a furrow on the surface by which they adhered to the tree, on which side they are usually somewhat soiled; it has a faint, somewhat nauseous odour, and a sweetish, insipid taste. 2d. Fatty manna, *Manna Pinguis;* it is in soft, viscid fragments of a brownish-yellow colour, much soiled, and mixed with impurities; its odour is very nauseous, and its taste viscid and disagreeable.

C. P.—Manna consists of a peculiar saccharine principle named *Mannite*, uncrystallizable sugar, gummy matter, nitrogenous matter, and moisture. It softens with the heat of the hand, and melts at a temperature a little higher; it is soluble in three parts of water at 60°, and in eight parts of rectified spirit. Mannite, its active principle, may be obtained by boiling manna in alcohol, and pouring off the spirit, from which, as it cools, the mannite is deposited in crystals; it exists in manna in the proportion of about 60 per cent.

Flake manna, which is alone employed in medicine, is not liable to adulteration.

Th. E.—Manna is a very mild laxative, employed only in the diseases of children and delicate females; in the present day it is seldom administered alone, being generally used for sweetening cathartic mixtures. When first gathered, manna does not possess any laxative properties, and is employed as a nutritive article of diet in the countries where it is produced.

D. & M. of Adm.—For children, ʒi. to ℥ss.; for adults, ℥i. to ℥ij.—*Mannite*, for children, ʒss. to ʒij.; for adults, ʒss. to ℥i.—*Aqua Laxativa Viennensis*, A. (Manna, 8 parts; senna, 6 parts; bitartrate of potash, 1 part; water, 48 parts; dissolve.) Dose, f℥ij. to f℥iv.

Mel, D. L. E. *Juice extracted from flowers, and prepared by the Bee*, L. *Saccharine secretion of Apis Mellifica*, E. *Honey.*—Honey is secreted by the nectaries of most flowers, from whence it is col-

lected by the bee, an insect belonging to the order *Hymenoptera;* in the honey-bag of the insect, which is a dilatation of the œsophagus, it probably undergoes some alteration previous to its deposition in the cells of the honeycomb. Honey is too well known to require any description; it is composed of grape-sugar, cane-sugar, mannite, acetic acid, aromatic principle, wax, &c. It is sometimes adulterated with sand, with starch, or with wheaten or pea flour; the first adulteration may be detected by dissolving in water; the others by the action of tincture of iodine on the cooled decoction, which is rendered blue if any fecula be present. Dissolved in a large quantity of water, honey possesses demulcent and cooling properties; in a small portion of water it operates as a mild laxative. It is now but little used in medicine; nevertheless, eaten at breakfast, it is found very beneficial by persons liable to habitual constipation. Honey has in some instances proved poisonous, in consequence of having been collected by the bees from poisonous flowers. By melting honey in a vapour-bath and removing the scum, clarified honey, *Mel Despumatum*, D., is prepared. Both the flavour and odour of honey are injured by this process.

Olivæ oleum, D. L. E. *Oil expressed from the fruit (of the pericarp*, E.) *of Olea Europæa.*—This tree, originally a native of Asia Minor, now grows freely on the borders of the Mediterranean, and is cultivated all over the South of Europe, especially in Provence. It belongs to the natural family *Oleaceæ*, and to the Linnæan class and order *Diandria Monogynia.*

B. C.—A moderately-sized tree with hard, veined wood; leaves in pairs, acute, hoary beneath, giving a whitish character to the foliage; flowers small, white; drupe elliptical, dark-bluish green, with a hard nut, generally one-seeded.

P. U. & M. of Prep.—The finer sorts of the oil are obtained by simply pressing the fresh, ripe fruit in a mill; a second sort, by moistening the marc, left after the first expression, with boiling water and repressing it; and a third and very inferior sort, by boiling this cake in water, and submitting it to very strong pressure.

P. P.—Olive oil is a transparent, unctuous fluid, of a yellow colour, pale or greenish according to quality (the finer sorts being of a lighter shade); when good, odourless, with a bland, oily taste; by keeping it acquires both a rancid odour and taste, more slowly, however, than the other fixed oils. Sp. gr., ·911 at 77° F.

C. P.—It is composed of 72 parts of *elaine* and 28 of *margarin.* Olive oil readily saponifies, but exposed to the air, even in thin layers, it thickens, but does not dry. It congeals at 36° F., is insoluble in water or in alcohol, but at 59° it dissolves in $1\frac{1}{2}$ times its weight of ether.

Adulterations.—Cheaper vegetable oils are commonly employed to adulterate olive oil, as poppy oil and rape-seed oil. The best test for ascertaining its purity is that of Pontet, adopted in the last edition of the Edin. Phar.: "Mix with a twelfth of its volume of nitrate of mercury, prepared by dissolving with a gentle heat, ʒiv. of mercury in fʒixss. of nitric acid (density 1380 to 1390); if pure, it becomes in three or four hours like a firm fat, without any separation of liquid oil." For ordinary purposes, the presence of other

fixed oils may be more readily ascertained by shaking the oil in a bottle half filled, when, if it be pure, the surface of the oil soon becomes smooth by repose; but if it be adulterated, a number of air-bubbles, *beads*, remain.

Th. E.—It is seldom given by the mouth as a cathartic, but forms an admirable addition to *laxative enemata*, in inflammation or spasm of the intestines, in dysentery, or in irritation of the urino-genital organs.

D. & M. of Adm.—fʒi. to fʒij. by the mouth; fʒij. to fʒiv. in an enema with decoction of barley.

[Podophyllum peltatum. *May apple, Mandrake*, U. S. P.—Indigenous. *Polyandria Monogynia.*

P. & C. P.—The fruit is of a sweetish, subacid taste; the leaves poisonous; the root, when powdered, has a sickly smell, and the taste, at first sweetish, becomes bitter, acrid, and nauseous, and contains a bitter principle called *podophyllin.*

Th. E.—It is analogous to jalap, for which it is sometimes substituted, an active hydragogue cathartic, and has repute in dropsy.

D. & M. of Adm.—Dose of the *powder* for an adult, x. to xxx. grs., either alone or in combination with bitartrate of potassa. *Extractum.*—Prepared as jalap, which see. Dose, v. to x. grs. *Tinctura.*—Ibid. Dose, ii. to vi. drachms.]

Potassæ acetas, D. L. E. *Acetate of Potash.*

P. P.—Masses of white, needle-shaped, satiny crystals, odourless when dry, but emitting a faint acetous odour when moistened; they have a pungent, somewhat acrid, but cooling taste, and are soapy to the touch. Sp. gr., 2·10.

C. P.—It is composed of 1 eq. of potassa, and 1 of anhydrous acetic acid ($KO, C^4H^3O^3$); it deliquesces on exposure to the air, and is very soluble both in water and in alcohol; by heat it is fused and then decomposed, *pyroacetic spirit* is driven off, and *carbonate of potash* left.

Prep.—*Dub.* "Add gradually to any quantity of carbonate of potash prepared from crystals of tartar, about five times its weight of distilled vinegar of a medium heat; when the effervescence shall have ceased, and the liquor have given off vapours for some time, add by degrees distilled vinegar, until all effervescence shall cease; the dry salt produced by evaporation is to be liquefied by cautiously raising the heat; dissolve the cooled salt in water, filter and evaporate, until it becomes, on cooling, a white crystalline mass; keep in well-closed bottles." The London and Edinburgh Colleges direct it to be prepared by dissolving, the former, ℔j. of carbonate of potash in acetic acid, fʒxxvi., and distilled water, fʒxij.; the latter, ʒvij., or a sufficiency of dry carbonate of potash in Oiss. of pyroligneous acid, so as to neutralize it, straining and evaporating with a cautious heat the liquor, so as to obtain, on cooling, a crystalline mass.

This salt is not liable to adulteration; it should be snow-white.

Th. E.—Scarcely ever used as a cathartic; nevertheless, in sufficient doses it operates effectually, producing watery evacuations, and is, therefore, independent of its diuretic properties, well adapted for dropsical diseases.

D. & M. of Adm.—As a cathartic, ʒij. to ʒiij., dissolved in a large quantity of water.

Incomp.—The mineral acids and their soluble salts, and tartaric acid.

Potassæ bisulphas, D. L. E. *Bisulphate of Potash.*

P. P.—In minute, transparent crystals, which belong to the right prismatic system; odourless, with a very acid and bitter taste. Sp. gr., 2·163.

C. P.—It is composed of 2 eq. of sulphuric acid, 1 of potassa, and 1 of water ($HO, SO^3 + KO, SO^3$); the excess of acid acting upon metals and alkaline bases very much as if it were free. The crystals are permanent in the air, and are soluble in about twice their weight of water at 60°; the solution has a strongly acid reaction. By a red heat, the water of crystallization and half the acid are expelled, and sulphate of potash remains.

Prep.—*Dub.* "Commercial sulphuric acid, one part; carbonate of potash from potashes, a sufficiency; water, six parts; saturate the carbonate of potash with one part of the sulphuric acid mixed with the water; then add the other part of the sulphuric acid, and evaporate the liquor, so that crystals may form by cooling." *Lond., Edin.* "Take of the salt which remains after the distillation of nitric acid, ℔ij.; sulphuric acid (of commerce, E.), ℔j. (fℨvij., fℨi., E.); boiling water, Ovj.; dissolve the salt in the water, add the acid, and mix. Then concentrate the solution, and set it aside, that crystals may be formed."

Not liable to adulteration.

Th. E.—Rarely employed in medicine; it operates as a mild cathartic, and as its after effects are tonic, it may be used with advantage in debilitated habits; combined with rhubarb, it conceals much of its nauseous taste, and promotes its cathartic properties. Dr. Barker proposed a solution of 73 grs. of this salt mixed with a solution of 72 grs. of carbonate of soda as a cheap effervescing purgative draught, but it forms an extremely nauseous compound.

D. & M. of Adm.—ʒss. to ʒiss., dissolved in from fℨiij. to fℨvj. of water.

Incomp.—Alkalies; earths, and their carbonates; metallic salts; and tartaric acid.

Potassæ bitartras, D. L. E. Tartari Crystalli, D. *Bitartrate of Potash; Crystals of Tartar; Crude Tartar; Cream of Tartar.*

P. P.—This salt is met with in the form either of a fine white powder or a semitransparent crystalline mass, the crystals being oblique rhombic prisms; it is without odour, but has an agreeable acid taste. Sp. gr., 1·953.

C. P.—It is composed of 1 eq. of potassa, 2 of tartaric acid, combined in the crystalline state with 1 of water ($HO, KO, H^4C^8O^{10}$); it is unalterable in the air, is soluble in 184 parts of water at 68°, and in 18 parts of boiling water, the solution having a strongly acid reaction. By heat the salt is decomposed, and converted into a compound of charcoal and carbonate of potash. (*Black Flux*).

Prep.—Bitartrate of potash is an article of the Materia Medica; it is obtained by dissolving and recrystallizing *argol*, an obscurely crystalline substance, which concretes on the inside of casks in which new wine has been kept; this constitutes the *crystalli tartari* of the *Dub. Phar.* A purer salt is procured by redissolving those

crystals, evaporating the solution slowly, and removing the crust as it forms on the surface, whence the name *cream of tartar*.

Adulterations.—This salt in the state of powder is very much adulterated; the substances commonly employed for this purpose are finely-powdered marble, alum, bisulphate of potash, and wheaten flour or starch. The tests of the *Ed. Ph.* will detect any of these impurities: "Entirely soluble in 40 parts of boiling water. Grs. xl. in solution are neutralized with gr. xxx. of crystallized carbonate of soda; and when then precipitated with gr. lxx. of nitrate of lead, the liquid remains precipitable by more of the test."

Th. E.—In full doses, cream of tartar operates as an active cathartic, producing many watery evacuations without much irritation. It is seldom prescribed singly, but, in general, with some of the milder vegetable cathartics. Thus, combined with sulphur in the form of electuary, it is an exceedingly useful purgative in hœmorrhoidal affections and in skin diseases; and with jalap, it forms an excellent cathartic in dropsies.

D. & M. of Adm.—3iij. to 3vi., made into an electuary with honey or treacle. Its solubility in water may be much increased, without impairing its medicinal activity, by adding to it a fourth of its weight of boracic acid.—*Effervescing aperient with cream of tartar.* (Cream of tartar, 3iij.; carbonate of soda, in crystals, 3iiss.; water, f℥viij.) For one dose.

Incomp.—Lime-water; ammonia; the carbonates of potash and of soda; acetate of lead; magnesia, and its sulphate.

Potassæ sulphas, D. L. E. *Sulphate of Potash.*

P. P.—A solid white salt, crystallizing usually in single or double six-sided prisms, terminated by six-sided pyramids; inodorous, with a slightly bitter, saline taste. The crystals are very hard, and are therefore employed in pharmacy for triturating and dividing vegetable powders. Sp. gr., 2·400.

C. P.—It is composed of 1 eq. of potassa, and 1 of sulphuric acid (KO, SO^3); is unalterable in the air; heated it decrepitates, and at a strong red heat fuses, but is not decomposed; it requires 16 parts of temperate and 5 of boiling water for its solution, but is insoluble in alcohol.

Prep.—*Dub.* "Dissolve the salt which remains after the distillation of nitric acid in a sufficiency of water; add of carbonate of potash from potashes, sufficient to saturate the superabundant acid; evaporate the filtered liquor, that crystals may be formed." *Lond.* "Take of the salt which remains after the distillation of nitric acid, ℔ij.; boiling water, cong. ij.; ignite the salt in a crucible until the excess of sulphuric acid is entirely expelled, then boil it in the water until a pellicle floats, and the liquor being strained, set it aside, that crystals may be formed. The liquor being poured off, dry them." *Edin.* "Take of the residuum of the preparation of pure nitric acid, ℔ij.; boiling water, cong. ij.; white marble in powder, a sufficiency. Dissolve the salt in the water; add the marble gradually till effervescence ceases and the solution is completely neutralized; filter the liquid, and evaporate it till a pellicle forms on its surface; then set it aside to cool and form crystals."

Not liable to adulteration.

Th. E.—A mild cathartic, operating effectually with scarcely any disturbance of the system, but, on account of its little solubility,

not much employed. It is not adapted for children, as it is apt to produce vomiting in them if given in a sufficient dose. Sulphate of potash is an excellent purgative for females after delivery, when we wish to diminish the secretion of milk.

D. & M. OF ADM.—3i. to 3vj. dissolved in warm water, or in powder combined with rhubarb.—*Potassæ sulphas cum sulphure*, E. (Nitrate of potash and sulphur, equal parts; mix thoroughly, and project in small successive portions into a red-hot crucible; when the deflagration is over and the salt has cooled, reduce it to powder, and preserve in well-closed bottles.) A mild cathartic, much more soluble than the plain sulphate. Dose, 3ss. to 3i.

INCOMP.—Nitric and muriatic acids; tartaric acid; chloride of calcium; chloride of barium; the acetate and diacetate of lead; nitrate of silver; and sulphate of magnesia.

POTASSÆ TARTRAS, D. L. E. *Tartrate of Potash.*

P. P.—A solid, white salt, crystalline, but generally met with in the form of a granular powder; the crystals are small right rhombic prisms; inodorous, with a cooling, saline taste. Sp. gr., 1·556.

C. P.—It is composed of 1 eq. of potassa, and 1 of tartaric acid ($KO, C^8H^4O^{10}$); it attracts moisture in a damp atmosphere, but does not deliquesce; exposed to heat it is decomposed, and converted into a compound of carbonate of potash and charcoal. It is soluble in an equal weight of cold water, whence the name *soluble tartar* is applied to it; it is likewise soluble in alcohol.

PREP.—*Dub.* "Carbonate of potash from potashes, 5 parts; bitartrate of potash, 14 parts,; boiling water, 45 parts; to the carbonate of potash dissolved in water add gradually the bitartrate of potash in very fine powder; evaporate the liquor, previously filtered through paper, and set it aside, that crystals may be formed by cooling." *Lond., Edin.* "Bitartrate of potash, in powder, lbiij.; carbonate of potash, ʒxvi. (or a sufficiency, L.); boiling water, Ovi.; dissolve the carbonate in the boiling water, then add the bitartrate (till the liquor is neutralized, E.), and boil. Filter the liquor, and concentrate by boiling till a pellicle floats on the surface, and set it aside, that crystals may be formed. The liquor being poured off, dry these, and again evaporate the liquor, that crystals may be produced."

Adulterations.—This salt is sometimes adulterated with the bitartrate, which may be known by its not being soluble in its own weight of water at 50°.

TH. E.—A mild but efficient purgative, not much employed in the present day. By accelerating the operation of the resinous purgatives, it corrects their griping properties.

D. & M. OF ADM.—3ij. to 3x., in solution.

INCOMP.—All acids, and most acidulous salts; lime-water; chloride of calcium; nitrate of silver; and acetate of lead.

PRUNA, D. L. E. *Prunes. The dried fruit of Prunus domestica.*—The plum-tree, originally a native of Syria, is now cultivated extensively in the temperate regions of Europe, and in the British Isles; it belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Monogynia.* The fruits dried in the sun, *prunes*, are imported from Bourdeaux. They are mildly laxative, and are sometimes added to infusion of senna, to conceal

its nauseous taste. They enter into the composition of the electuary of senna of the Pharmacopœias.

Rhamni baccæ, E. Rhamnus, L. Rhamnus catharticus, baccæ, D. *Buckthorn berries. Fruit of Rhamnus catharticus.*—An indigenous shrub, belonging to the natural family *Rhamnaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Stems about ten feet high, branching, spiny; leaves ovate, sharply serrated; flowers small, yellowish-green, diœcious; fruit, a berry.

P. U.—The fresh berries and their expressed juice.

P. P.—The berries are about the size of pease, black, shining, four-seeded, with a green, juicy parenchyma; they have an acrid, nauseous taste, and when bruised, a faint, unpleasant odour. The juice is preserved in the form of sirup.

C. P.—The juice consists of a peculiar colouring matter, acetic acid, mucilage, sugar, and nitrogenous matter. The nature of its purgative principle is unknown. By evaporating to dryness, the juice mixed with lime, or with alum, the pigment, *sapgreen*, is obtained.

Adulterations.—The berries of the *Rhamnus frangula* are often substituted for, or mixed with buckthorn berries; they may be detected by being only two-seeded.

Th. E.—The fresh berries or their expressed juice operate as powerful cathartics, producing many watery evacuations, but, in consequence of the severity of their operation, frequently accompanied by severe tormina, thirst, and distressing nausea; although in former days much vaunted in the treatment of dropsy, they are at present scarcely ever used.

D. & M. of Adm.—Of the fresh berries, 10 to 20.—*Sirupus Rhamni*, D. L. E. (Fresh juice of the berries, *by measure*, ℔iiss. (Oiv., L. E.); ginger, sliced, and pimento, bruised (powdered, L.), of each, ʒiij. (ʒvj., L. E.); let the juice rest (for 3 days, L. E.), that the dregs may subside, and strain. Macerate for 24 (4, L. E.) hours the pimento and ginger in ℥x. (Oi., L. E.) of the strained juice, and filter; boil down the rest of the juice to ℔j., *by measure* (Oiss., L. E.), and with sugar (℔iv., L. E.) form the whole into a sirup.) Dose, f℥ss. to f℥i.

Rheum, D. L. E. *Rhubarb; Root of Rheum palmatum, and Rheum undulatum*, D. *Root of Rheum palmatum*, L. *Root of an undetermined species of Rheum*, E.—The exact species of the genus rheum, from which the different varieties of rhubarb met with in commerce are obtained, is as yet unknown. They inhabit the northern regions of Asia, from the shores of the Caspian Sea to the Chinese wall, and are cultivated in most of the countries of Europe. The genus is placed in the natural family *Polygonaceæ*, and in the Linnæan class and order *Enneandria Monogynia.* Besides the species mentioned in the Pharmacopœias, the following have been referred to by different authorities as yielding rhubarb of one kind or another: viz., *R. rhaponticum; R. compactum; R. Emodi; R.*

Webbianum; R. Spiciforme; R. Moorcroftianum; R. crassinervium; R. leucorrhizum, &c.

B. C.—All the species are characterized by having a perennial root, which sends up annual root-leaves, usually very large, deeply incised and wavy at the edges, generally cordate; an herbaceous, flowering stem, from two to four feet high; flowers small; calyx petaloid, six-parted, withering.

P. U. & M. of Prep.—The root; it is dug up when the plant is five or six years old, washed, scraped, and cut into various-sized pieces to facilitate the drying; they are then pierced, strung upon cords, and dried differently in various localities; sometimes on stone tables heated beneath by a fire, sometimes in the sunshine, sometimes slowly under sheds by a current of air, while in Tartary the Moguls are said to hang them about their tents or on the horns of their sheep.

P. P.—Three varieties of rhubarb are met with in British trade, each of which we shall consider separately, viz., Russian, Chinese or East Indian, and English rhubarb.

1. Russian Rhubarb; *Turkey Rhubarb;* it is met with in irregularly-shaped pieces, from an inch to three inches in breadth, roundish, sometimes flattened on one side, angular, heavy, of a bright-yellow colour, without any traces of epidermis; generally perforated with conical, not cylindrical holes, in some pieces extending completely, in others only partially through their substance; internally, they are compact, beautifully marbled with yellow, red, and white streaks or points; the odour is strong and peculiar; the taste is bitter, and faintly astringent; chewed, it feels gritty under the teeth, owing to the presence of crystals of the oxalate of lime, and it tinges the saliva yellow; it may be pulverized readily. The powder is of a bright-yellow colour. This description of rhubarb is collected by the Bucharians on the mountains of Tartary, brought by them to the Russian town of Kiachta for barter, whence it is conveyed to St. Petersburg, where it is sorted, packed into boxes or cases which are covered on the outside with a hide, and then exported to the different countries of Europe and to the British Isles.

2. Chinese, or East Indian Rhubarb, is met with in globular or flat pieces, rounded, not angular on the surface, of a brownish-yellow colour, usually presenting some traces of epidermis; somewhat heavier than Russian rhubarb; perforated with cylindrical holes, in many of which are found pieces of cord, by which the roots were suspended while being dried; internally they are close and compact, marbled and spotted yellowish-brown and whitish; the odour is somewhat stronger than that of Russian rhubarb, the taste similar; the powder is not of so bright a colour. This description is the product of the northern provinces of China; it is imported in chests directly from Canton or by way of Singapore.

3. English Rhubarb.—Two kinds are commonly met with: 1st. *Stick Rhubarb*, which occurs in pieces about five or six inches long, and half an inch in diameter, round, striated, of a dirty yellowish-brown colour externally, blackish internally, with reddish streaks; its odour is faint, and its taste astringent, not gritty. 2d. *Trimmed Rhubarb;* this sort is often sold for Turkey rhubarb, which it is prepared to represent; its texture, however, is always soft and

spongy; it has a pinkish hue, is mucilaginous, and is pulverized with difficulty; its taste is astringent, its odour faint, and it is not gritty under the teeth, containing but few crystals of oxalate of lime.

C. P.—According to the most recent analysis, that of Brandes, in 1836, rhubarb consists of a peculiar principle, named by him *Rhabarberic acid* (*Rhein*, *Rheumin*, *Rhabarberin*, *Caphopicrite*, of other chemists), gallic and tannic acids, uncrystallizable sugar, starch, gummy extractive, colouring extractive, pectic acid, malate and gallate of lime, oxalate of lime, inorganic salts, silica, iron, and woody fibre. *Rhabarberic acid*, the active principle of rhubarb, was obtained by its discoverer in the proportion of 2 per cent. in a pure, and 10 per cent. in an impure form. Rhubarb yields its active principles to both cold and boiling water, to proof spirit, to alcohol, and to ether.

Adulterations.—The inferior sorts, especially British rhubarb, are frequently mixed with, or substituted for, the finer kinds; the fraud may be detected by the characters given above for the different descriptions. Powdered Turkey, or East Indian rhubarb, is very generally adulterated with British rhubarb; the fraud is difficult of detection, but the fresh powder of the finer sorts is always of a *bright*-yellow colour.

Th. E.—Rhubarb acts upon the whole tract of the digestive canal as a mild tonic, cathartic, and astringent. In small doses, it alone manifests its tonic properties, promoting the digestive process as indicated by increased appetite, and an improvement in the quality of the alvine secretions. In full doses, it operates as a mild cathartic, stimulating to increased activity the muscular coat of the whole of the intestinal canal, more especially that of the duodenum, but scarcely, if at all, augmenting the secretions. Its astringent property is manifested after the cathartic action has ceased, constipation usually following its purgative effects. The combination of these properties, as well as the safety and mildness of its operation, renders rhubarb a remedy of much value in many diseases. Thus, in the treatment of the early stages of the *diarrhœa of irritation*, it is the most efficacious purgative we can employ; it is also peculiarly adapted as a cathartic for infancy and childhood, and as a general laxative for persons with enfeebled digestion, and in all cases of debility of the digestive organs. For the same reasons, rhubarb is inadmissible in the treatment of febrile and inflammatory affections. Rhubarb is absorbed in the course of its operation, and its peculiar odour and yellow colouring matter may be recognised in the urine, in the sweat, in the serum of the blood, and in the milk of nurses, to the latter of which it imparts a purgative property.

D. & M. of Adm.—In powder, as a stomachic tonic, gr. v. to gr. x.; as a cathartic, ʒi. to ʒij.—*Pulvis Rhei comp.*, E. (Magnesia, ℔i.; ginger, in fine powder, ʒij.; rhubarb, in fine powder, ʒiv.; mix thoroughly, and preserve in well-closed bottles.) A useful antacid purgative, commonly known as *Gregory's powder*. Dose,

for children, gr. v. to gr. xij.; for adults, ʒss. to ʒi.—*Pulvis Rhei comp.*, Guy's H. (Rhubarb and carbonate of soda, of each, ʒj.; calumba, ʒij.; mix.) Dose, gr. x. to gr. xx.—*Pulvis Rhei cum Hydrargyro*, Guy's H. (Rhubarb, ʒiv.; calomel and ginger, of each, ʒi.; mix.) Dose, gr. x. to gr. xx.—*Extractum Rhei*, D. L. (Rhubarb, bruised (powdered, L.), ℔i. (℥xv., L.); proof spirit, *by measure*, ℔j. (Oj., L.); distilled water, *by measure*, ℔vij. (Ovij., L.); macerate for four days (with a gentle heat, L.), filter, and allow the dregs to subside; pour off the clear liquor and evaporate (when strained, L.) to a proper consistence.)—E. (Rhubarb, ℔j.; water, Ov.; cut the rhubarb into small fragments; macerate for 24 hours in Oiij. of the water; filter through a cloth, express moderately; macerate the residuum with the rest of the water for 12 hours, filter with the same cloth as before, and express the residuum strongly. The liquors, again filtered if necessary, are then to be evaporated to a proper consistence in the vapour-bath.) Dose, gr. x. to ʒss.—*Pilulæ Rhei*, E. (Rhubarb, in fine powder, 9 parts; acetate of potash, 1 part; conserve of red roses, 5 parts; beat into a proper mass.) Dose, gr. v., gr. xv.—*Pilulæ Rhei comp.*, L. E. (Rhubarb, in fine powder, ℥j. (12 parts, E.); aloes, powdered, ʒvj. (9 parts, E.); myrrh, powdered, ℥ss. (6 parts, E.); soap, ʒi. (6 parts, E.); (oil of caraway, fʒss., L.; oil of peppermint, 1 part, E.); (sirup, q. s., L.; conserve of red roses, 5 parts, E.); mix, and beat together till incorporated.) Mildly tonic and purgative. Dose, gr. v. to ʒi.—*Pilulæ Rhei et Ferri*, E. (Dried sulphate of iron, 4 parts; extract of rhubarb, 10 parts; conserve of red roses, 5 parts; mix.) Tonic and laxative, useful in chlorosis. Dose, gr. x. to gr. xv.—*Infusum Rhei*, D. L. E. (Rhubarb, sliced (in coarse powder, E.), ʒi. (ʒiij., L.; ℥i., E.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oi., L.; fʒxviij., E.); macerate (digest, D.) for 2 hours in a vessel lightly covered (12 hours, and add fʒij. of spirit of cinnamon, E.), and strain.) Stomachic, and very mildly laxative; a useful vehicle for more active purgatives. Dose, fʒi. to fʒiv.—*Tinctura Rhei*, E. (Rhubarb, in moderately fine powder, ℥iiiss.; cardamom seeds, bruised, ℥ss.; proof spirit, Oij.; mix the rhubarb and cardamoms, and proceed by the process of percolation as directed for tincture of cinchona; or it may be prepared by digestion.) A cordial purgative, employed as an addition to cathartic mixtures, in doses of fʒi. to fʒiij.—*Tinctura Rhei comp.*, D. L. (Rhubarb, sliced, ℥ij. (℥iiss., L.); liquorice, bruised, ℥ss. (ʒvi., L.); saffron, ʒij. (ʒiij., L.); (cardamom seeds, freed from their capsules and bruised, ℥ss., D.; ginger, sliced, ʒiij., L.;) proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 7 (14, L.) days, and filter.) Uses and dose same as last preparation.—*Tinctura Rhei et Aloes*, E. (Rhubarb, in moderately fine powder, ℥iss.; Socotrine or East Indian aloes, in moderately fine powder, ʒvi.; cardamom seeds, bruised, ʒv.; proof spirit, Oij.; mix the powders, and proceed as for tincture of cinchona.) A cordial purgative. Dose, fʒss. to fʒi.—*Vinum Rhei*, E. (Rhubarb, in coarse powder, ℥v.; canella, in coarse powder, ʒij.; proof spirit, fʒv.; sherry, Oi. fʒxv.; digest for 7 days, strain, express strongly,

and filter.) Stomachic and purgative. Dose, f℥ij. to f℥i.—*Sirupus Rhei*, P. (Rhubarb, 90 parts; boiling water, 500 parts; sugar, q. s.; make a sirup.) Dose, f℥ss. to f℥i.

[U. S. P.—*Tinctura Rhei et Sennæ. Warner's Gout Cordial.*—Take of rhubarb, bruised, 1 oz.; senna, 2 drachms; coriander and fennel seed, bruised, each, 1 drachm; red saunders, rasped, 2 drachms; saffron and liquorice, each, ½ a drachm; raisins, deprived of their seeds, half a pound; diluted alcohol, 3 pounds. Macerate for 14 days, express, and filter through paper. Aromatic, stomachic, and laxative. Dose, a wine-glassful.]

[U. S. P.—*Aromatic Sirup of Rhubarb.*—Take of rhubarb, bruised, 2½ oz.; cloves and cinnamon, bruised, each, ½ oz.; nutmeg, bruised, 2 drachms; diluted alcohol, 2 pints; sirup, 6 pints. Macerate the rhubarb and aromatics in the diluted alcohol for 14 days, and strain; then, by a water-bath, evaporate the liquor to a pint, and while it is still hot, mix it with the sirup, previously heated.]

[*Vinum Rhei Compositum. Tinctura Darelii.*—Rhubarb root, 1 oz.; cort. aurant. amar., 2 drachms; sem. cardamom, 1 drachm; elecampane root, ½ oz; vinum, ℔j. Macerate for a few days, and filter. Dose, ½ oz. to 1 oz.]

Incomp.—With the infusion—ammonia; carbonate of potash; lime-water; the mineral acids; acetate of lead; corrosive sublimate; tincture of the muriate of iron.

Ricini oleum, D. L. E. *Castor oil; Oil expressed from the seeds of Ricinus communis.*—The castor-oil tree is a native of Africa and the East Indies; it is cultivated at present very extensively in the West Indies, and in North and South America; it also grows in the South of Europe and in the British Isles. It belongs to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—In northern countries, an herbaceous annual, seldom exceeding 3 or 4 feet in height; in warm climates it becomes an arborescent perennial, attaining a height of 20 to 30 feet; leaves large, of a dull-green colour, shining, palmate, deeply cut into acute lobes, serrated; flowers, in terminal panicles, glaucous-green, monœcious; fruit, a three-celled capsule covered with spines, each cell containing one seed; the seeds are oval, about three lines broad, four lines long, and a line and a half thick; the seed-coat is pale gray, marbled with blackish and yellowish-brown spots and stripes; it encloses a thick, fleshy, oily nucleus, within which is a large, dicotyledonous, leafy embryo.

P. U. & M. of Prep.—The fixed oil of the seeds; it is obtained by expression with or without the aid of heat, the seed-coats being usually first removed; that obtained without heat is called *cold-drawn castor oil*, and bears the highest character. This is the process followed in the West Indies, and for the finer qualities of oil in the East; more generally, however, in the East Indies, the seeds are boiled in water, dried and bruised, and again boiled with water till the oil separates and floats on the surface. In North America, the seeds are heated and pressed, and the oil thus obtained is boiled with water, to free it from impurities. The seeds yield about 30 per cent. of oil.

P. P.—Castor oil is a viscid, oily liquor, of a very pale straw colour (inferior sorts are deep yellow), having a very faint, slightly nauseous odour, and a mild, greasy taste. Sp. gr., 0·969.

C. P.—According to the analysis of Bussy and Lecanu, it is a

compound of three fatty acids, *ricinic, elaïodic, and margaritic.* Its ultimate constituents, according to Ure, are 74 per cent. of carbon, 10·29 of hydrogen, and 15·71 of oxygen. Exposed to a cold a little below 32°, it becomes thick and turbid; at 0 it congeals into a transparent yellow mass; by exposure to the air it thickens and dries without becoming opaque, and hence is called a *drying oil;* it is decomposed by a heat above 500°. Castor oil is soluble in ether and in cold alcohol; the latter property is not possessed by any other fixed oil with which we are acquainted except concrete palm oil. East Indian castor oil is the kind principally employed at present in the British Isles; West Indian castor oil is not imported; and American castor oil is but little esteemed by the druggists (although equally efficacious as a medicine and free from any unpleasant flavour), in consequence of its becoming turbid in cold weather, and throwing down a copious deposite of white fatty crystals.

Adulterations.—The adulteration of castor oil with other fixed oils, a fraud more frequently practised in former days than at present, may be readily detected by its solubility in alcohol, pure castor oil being entirely dissolved by its own volume of alcohol. It should be also free from any rancid odour or acrid taste.

Th. E.—Castor oil is a mild but effectual cathartic, operating soon after it has been taken, without pain or uneasiness, producing three or four thin, feculent, not watery evacuations; these properties adapt it for all cases in which we desire to evacuate the contents of the intestinal canal without producing abdominal irritation or general disturbance of the system. The only objection to its employment is its disagreeable greasy taste, in consequence of which it frequently occasions nausea and vomiting. The following are a few of the cases in which its use as a cathartic is particularly indicated: inflammatory or spasmodic diseases of the intestinal canal or of the urino-genital apparatus; hœmorrhoidal affections; stricture of the rectum; during pregnancy and after delivery; in diseases of infancy and childhood; after surgical operations about the pelvis or abdomen, &c. If castor oil be at all rancid, it becomes very acrimonious, causing much irritation, and sometimes even troublesome diarrhœa.

D. & M. of Adm.—f℥ss. to f℥ij., by the mouth or in the form of enema; it is best taken floating on the surface of water to which some aromatic tincture, as of cascarilla or of orange peel, has been added; or it may be made into an emulsion with yolk of egg or with mucilage.—*Castor oil purgative emulsion*, P. (Castor oil, f℥i.; yolk of egg, 1; orange-flower water, f℥ss.; water, f℥ij.; mix.) Sufficient for one dose.

Sambucus nigra, D. L. E. *The Common Elder.*—Elder flowers are officinal in the three pharmacopœias; the berries and inner bark of the stem are also officinal in the *Dub. Phar.* It is a small, indigenous tree, belonging to the natural family *Caprifoliaceæ*, and to the Linnæan class and order *Pentandria Digynia.* The inner

bark alone possesses cathartic properties, but it is at present never employed. It was used by Sydenham and Boerhaave as a hydragogue in passive dropsies. It is given in decoction, prepared by boiling ʒj. of the bark in Oij. of water down to Oj. The dose of this decoction is from fʒij. to fʒiv.

Scammonium, D. L. E. *Scammony; Gum-resin obtained from Convolvulus Scammonia.*—A native of Greece and various parts of the Levant, where it is found growing in hedges and bushy places. It is placed in the natural family *Convolvulaceæ*, and in the Linnæan class and order *Pentandria Monogynia.*

B. C.—Root very thick, fusiform, fleshy, abounding in a milky juice; stems smooth, herbaceous, climbing; leaves pointed, hastate; flowers on long, solitary peduncles, yellowish, with purple stripes.

P. U. & M. of Prep.—The inspissated juice of the root. The earth having been cleared away, the top of the root is sliced off obliquely about two inches below where the stems spring from it; as the juice flows out it is received in shells, and exposed to the air until it thickens; each root, although generally four feet in length and three or four inches in diameter, yields only about two drachms of scammony.

P. P.—Fine scammony, *Virgin scammony*, is in amorphous masses, weighing from two ounces to half a pound each, very porous, friable, and of an ash-gray colour externally; its fracture is conchoidal, very resinous, and of a dark greenish-black colour; the odour is strong, peculiar, resembling somewhat that of old cheese, heightened by being breathed on, and the taste is acrid and nauseous; sp. gr., 1·210. This variety of scammony is scarce, and when met with bears a very high price. Scammony, as it commonly occurs, is an impure article, usually imported in boxes or drums, seldom in cakes; it is heavier than virgin scammony, more compact, and of a pale ash-gray colour; its fracture is earthy, dull, not porous, and of a grayish-black colour, in some specimens presenting numerous white specks (chalk); its odour and taste are the same as of pure scammony. Sp. gr., from 1·276 to 1·543.

C. P.—According to Christison's analysis, fine specimens of virgin scammony consist of 81 to 83 per cent. of resin, 6 to 8 per cent. of gum, and some woody fibre, sand, moisture, and sometimes a trace of starch. In the best specimens which I have had an opportunity of examining, I have found but 68 per cent. of resin. The resin is the active principle of the drug; it may be readily obtained by the process of the *Ed. Ph.* (see below); in mass it is of a reddish-yellow colour, clear and semitransparent; its powder is pale straw colour; it is void of odour and taste when quite pure. It is soluble in alcohol and ether, and forms with unskimmed milk a fine uniform emulsion.

Adulterations.—No drug is more generally and more uniformly adulterated than scammony; it is, indeed, very difficult to meet with it in a perfectly pure state. And to so great an extent is the adulteration practised, that in many specimens which I have examined, I have frequently found not more than from 28 to 35 per cent. of resin present. The substances used to adulterate the drug are chalk and flour, either separately or conjointly. Both may be

readily detected; the former, by the effervescence produced when muriatic acid is dropped on a small fragment; the latter, by a cooled and filtered decoction of the powder being rendered blue by tincture of iodine.

Th. E.—Scammony, when pure, is a powerful cathartic, operating as a direct irritant to the intestinal mucous membrane, and producing copious watery evacuations. It is well adapted for cases of habitual constipation arising from a torpid state of the intestinal canal, in passive dropsies, in apoplectic affections, and as an active purgative for children, for whom it is beneficially combined with calomel. If there be any tendency to inflammation of the digestive organs, scammony is contra-indicated as a cathartic. From the difficulty of procuring the drug in a pure state, scammony has of late years fallen into much disrepute.

D. & M. of Adm.—In powder, if the scammony be pure, for an adult, gr. viij. to gr. xij., but, as usually met with, double that quantity; it should be prescribed in combination with some bland powder, or made into an emulsion with milk.—*Pulvis Scammonii comp.*, D. L. (Scammony, hard extract of jalap, of each, ʒij.; ginger, ʒss.; rub separately to very fine powder, and mix.) Dose, for an adult, gr. x. to gr. xx.; for a child, gr. iij. to gr. v.—*Pulvis Scammonii cum Hydrargyro*, H. (Scammony, ʒij.; calomel and white sugar, of each, ʒi.; mix.) Dose, same as last preparation; an excellent purgative for children.—*Extractum, sive Resina, Scammonii*, E. (Take any convenient quantity of scammony in fine powder, boil it in successive portions of proof spirit till the spirit ceases to dissolve anything, filter, distil the liquid till little but water passes over, then pour away the watery solution from the resin at the bottom, agitate the resin with successive portions of boiling water till it is well washed, and, lastly, dry it at a temperature not above 240°.) Dose, gr. ij. to gr. v.; best administered according to the following formula: *Mistura Scammonii*, E. (Resin of scammony, gr. vij.; unskimmed milk, fʒiij.; triturate the resin with a little of the milk, and gradually with the rest of it till a uniform emulsion be obtained.) Intended for one dose for an adult, but much too powerful; I have always found gr. v., triturated with the same quantity of milk, sufficient for the most obstinate bowels. This mixture cannot be distinguished either by smell or taste from rich new milk, and, consequently, forms a very convenient purgative for children, in doses of fʒss. to fʒiss.—*Electuarium* (*Confectio*, L.) *Scammonii*, D. L. (Scammony, powdered, ʒiss.; cloves, bruised, ginger, powdered, of each, ʒvj.; oil of caraway, fʒss.; sirup of roses, q. s.; "pour the sirup on the powders; then, having added the oil of caraway, mix all thoroughly," D. "Rub the dry ingredients together to very fine powder, and preserve them; then, whenever the confection is to be used, the sirup being gradually poured in, rub again; lastly, the oil of caraway being added, mix them all," L.) A stimulating cathartic, but seldom used. Dose, for an adult, ʒss. to ʒi.; for children, gr. v. to gr. xij.—*Sirupus Scammonii*, P. (Scammony, ʒss.; sugar and sirup of violets, of

each, ʒiv.; rectified spirit, fʒviij.) An ounce contains gr. xviij. of scammony. Dose, f3i. to f3iv.

Senna, D. L. *Leaves of Cassia senna*, D.—*Of Cassia lanceolata and Cassia obovata*, L.—*Senna Leaves.*

Senna Alexandrina, E. *Leaves of various species of Cassia, probably of Cassia lanceolata, of C. acutifolia, and of C. obovata; Alexandrian senna. As imported, it also contains an abundant admixture of leaves of Cynanchum Argel, which ought to be removed as far as possible by picking.*

Senna Indica, E. *Leaves of Cassia elongata; East Indian Senna, var. Tinnivelly.*

Some confusion still exists as to the species of the genus cassia which yield the senna leaves of commerce. The *Dublin College*, in referring them to one species, has perpetuated the error of Linnæus, who confounded several together; upon the whole, the references of the *Edinburgh College* appear to be the most correct. The various species are inhabitants of the north of Africa, particularly Egypt, of Arabia, and of the Indian Peninsula, where, probably, it has been introduced, and is now naturalized; they are also cultivated in the south of Europe, and in some of the West Indian Islands. The genus belongs to the natural family *Leguminosæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—Shrubs or herbs, frequently annual; leaves simply and abruptly pinnate; petioles frequently glanduliferous; leaflets opposite; sepals five, more or less unequal; petals five, unequal; stamens ten, free, unequal; ovary stalked, frequently arched; legumes various.

P. U. & M. of Prep.—The leaves; they are gathered in Upper Egypt twice a year, after the rains in August and September, and a second time about the middle of March; the branches are cut off, spread out on the rocks, and dried in the sun, when the leaves readily separate.

P. P.—Three sorts of senna are commonly known in the English market: Alexandrian senna, Tripoli senna, and East Indian senna. 1st. Alexandrian senna, the produce of Nubia and Upper Egypt, is imported in large bales and barrels from Alexandria; it consists of grayish-green leaflets, usually much broken, mixed with the flowers and fruits of the various species from which it is obtained; there are also a large quantity, generally about a tenth of the weight, of the leaves, flowers, and fruit of the *Cynanchum Argel;* and sometimes a considerable number of pods, with a few leaves of the *Tephrosia apollinea.* The odour of Alexandrian senna is nauseous, but resembling in some respects that of tea; the taste is viscid and nauseous. 2d. Tripoli senna. It scarcely differs from that just described, for which it is indiscriminately sold; the leaflets are perhaps more broken down, smaller, and of a greener colour; it seldom contains either Cynanchum or Tephrosia leaflets. 3d. East Indian senna, *Tinnivelly senna:* this occurs in large unbroken leaflets, from one to two inches long, and half an inch broad, thin and flexible, and of a fine green colour; many of the leaflets, however, are blackish, probably from imper-

fect drying; both odour and taste are similar to, but a little weaker than Alexandrian senna.

C. P.—According to MM. Lassaigne and Feneulle, Alexandrian senna is composed of *cathartin*, chlorophylle, yellow colouring matter, mucus, albumen, malic acid, and some salts. *Cathartin*, supposed to be the purgative principle, is an uncrystallizable, deliquescent substance, with a peculiar odour, and a bitter, nauseous taste. Senna leaves yield their active properties to both cold and warm water, to ether, to proof spirit, and to alcohol; warm water extracts about a third of the weight of the leaves.

Adulterations.—In Egyptian senna, as met with in British commerce, the only adulteration is that before indicated, namely, with Argel, and sometimes with Tephrosia leaflets. The former are readily distinguished by their paler yellowish colour, their coriaceous texture, their under surface being reticulated with veins, their upper surface somewhat rugose, and by their being equal-sided; the leaflets of all the true sennas being unequal at the base. Tephrosia leaflets are easily known by their silky surface, and by the lateral veins proceeding parallel to each other to the very edge of the leaf without ramifying. Two other adulterations are common on the Continent, but have never been met with, as far as I am aware, in the British market; one is with the leaflets of the *Colutea arborescens*, or bladder senna, which may be at once distinguished by their regularity at the base; the other, a more serious fraud, in consequence of the poisonous property of the substance employed, is with the leaflets of the *Coriaria Myrtifolia;* they are known by presenting three very prominent longitudinal nerves, and chemically by their infusion producing, with solution of sulphate of iron, a blackish precipitate (*tannate of iron*), and with gelatin a heavy whitish precipitate (*tannate of gelatin*).

Th. E.—Senna is an active cathartic, holding a middle place between the milder and more active medicines of this class; operating effectually, yet safely, though often producing nausea, griping, and flatulence; its action is somewhat stimulating, increasing the secretions, and exciting the peristaltic action chiefly, but not alone, of the small intestines. It is adapted for all cases requiring an effectual purgative; but it should be combined with the active saline cathartics, for which the infusion is a good vehicle, if it is necessary to diminish arterial action, or to produce general antiphlogistic effects. The only circumstance contra-indicating its employment is an inflammatory condition of the mucous membrane of the alimentary canal. The cathartic principle of senna is absorbed before its operation is produced, as is proved by its action on the intestines when the infusion is injected into the veins, and also by its imparting a purgative property to the milk of nurses.

D. & M. of Adm.—Senna is not administered in the form of powder; ʒij. to ʒss. infused in fʒij. of boiling water for half an hour, and the clear infusion poured off, will be sufficient for a dose; its taste is much concealed by the addition of some black tea, and it may be sweetened with sugar, and milk added; in this way it is

readily taken by children.—*Infusum Sennæ, comp.*, D. L. *Infusum Sennæ*, E. (Senna, ʒj. (ʒxv., L.; ʒiss. E.); ginger, sliced, ʒiss. (℥iv., L. E.); boiling (distilled, L.) water, *by measure*, ℔j. (Oj., L. E.); macerate for an hour in a close vessel, and strain.) Dose, fʒij. to fʒiv. The common cathartic mixture, *black draught*, of hospitals is prepared by adding ʒj. of sulphate of magnesia to fʒiv. of this infusion.—*Infusum Sennæ cum Tamarindis*, D. *Infusum Sennæ, comp.*, E. (Senna, ʒi.; tamarinds, ʒi.; coriander seeds, bruised, ʒi.; brown sugar, ʒss.; boiling water, fʒviij.; digest in a close earthen vessel, not glazed inside with lead, for four hours, and strain; it may be made with twice (or thrice, E.) the quantity of senna.) An excellent cathartic infusion. Dose, fʒij. to fʒiv.—*Sirupus Sennæ*, L. (Senna, ʒiiss.; fennel, bruised, ʒx.; manna, ʒiij.; sugar, ʒxv.; boiling water, Oi.; macerate the senna and fennel in the water with a gentle heat for an hour; strain; add the manna and sugar, and boil down to a proper consistence.)—E. (Senna, ʒiv.; boiling water, fʒxxiv.; treacle, ʒxlviij.; infuse the senna in the water for twelve hours, strain, and express strongly; concentrate the treacle in the vapour-bath as far as possible, and while still hot add the infusion, stirring carefully.) An agreeable cathartic for children, in doses of from fʒi. to fʒiv.; or as an addition to cathartic mixtures for adults, in doses of fʒss. to fʒj.—*Potio cathartica*, P. (Senna, ʒij.; rhubarb, ʒss.; sulphate of soda, ʒij.; manna, ʒiss.; infuse the senna and rhubarb for a quarter of an hour in fʒiv. of water with a gentle heat; add the salt and the manna, and when they are dissolved, strain with expression, and add sufficient peppermint water.) An excellent cathartic draught.—*Electuarium Sennæ*, D. (Senna, in fine powder, ʒiv.; pulp of prunes, ℔j.; pulp of tamarinds, ʒij.; sirup of brown sugar, *by measure*, ℔iss.; oil of caraway, ʒij.; boil the pulps in the sirup to the consistence of honey, then add the powder, and, when the mixture has cooled, the oil; mix all well together.)—*Electuarium Sennæ*, E. *Confectio Sennæ*, L. (Senna, ʒviij.; figs, ℔i.; (tamarind pulp and cassia pulp, of each, ℔ss. L.); prunes, ℔ss. (℔j., E.); coriander, ʒiv.; liquorice root (bruised, E.), ʒiij.; sugar, ℔iiss.; water, Oiij.; powder together the senna and the coriander, and sift out ʒx.; boil the figs and the liquorice (the residue, E.) in the water to half; squeeze and strain; evaporate in a water-bath down to fʒxxiv.; form a sirup by adding the sugar; add the sirup to the prunes (and other pulps, L.), throw in the sifted powder, and mix all.) Commonly known as *lenitive electuary*, a mild but efficacious compound in doses of from ʒij. to ʒss.; generally badly prepared, and very liable to adulteration, the true preparation being both troublesome and expensive.—*Electuarium Sennæ*, F. (Senna, in fine powder, ʒviij.; pulp of tamarinds, ʒxxiv.; coriander, in powder, ʒi.; sirup, fʒxvi.; mix.) Dose, ʒij. to ʒss.—*Tinctura Sennæ comp.*, D. L. (Senna leaves, ℔j. (ʒiiiss., L.); caraway, bruised, ʒiss. (ʒiiiss., L.); cardamom seeds, bruised (and deprived of their capsules, D.), ʒss. (ʒi., L.); (raisins, ʒv., L.); proof spirit, cong. j. (Oij., L.); macerate for 14 days, and strain.)—E. (Sugar, ʒiiss.; coriander, bruised, ʒi.;

jalap, in moderately-fine powder, ʒvi.; caraway, bruised, and cardamom seeds, bruised, of each, ʒv.; raisins, bruised, and senna, of each, ℥iv.; proof spirit, Oij.; digest for seven days, strain, express, and filter; may be more conveniently and expeditiously made by percolation, as directed for compound tincture of cardamoms; if Alexandrian senna be used, it must be freed from cynanchum leaves by picking.) A stimulating and cordial cathartic, in doses of f℥ss. to f℥j., only fit for cold leuco-phlegmatic habits; more generally prescribed as an adjunct to infusion of senna, or other cathartic mixtures, in doses of fʒi. or fʒij., to correct their griping qualities.

Sodæ phosphas, D. L. E. *Phosphate of Soda.*

P. P.—Transparent, colourless crystals, the form of which is the oblique rhombic prism; inodorous, with a cooling, saline, not disagreeable taste. Sp. gr., 1·333.

C. P.—It is composed of 2 eq. of soda, 1 of phosphoric acid, 1 of basic water, and 24 of water of crystallization ($HO, 2\,NaO, PO^5 + 24\,HO$); it effloresces and becomes opaque by exposure to the air; moderately heated, it fuses in its water of crystallization, which, if the heat be increased, is driven off. Phosphate of soda dissolves in four times its weight of cold water, and in twice its weight of boiling water; the solution has a feebly alkaline reaction; it is nearly insoluble in alcohol.

Prep.—Phosphate of soda is an article of the Materia Medica in the London Pharmacopœia; the processes of the Dublin and Edinburgh Colleges are as folows: "Take of bone ashes, in powder, 10 parts (℔x., E.); sulphuric acid, seven parts (Oij. f℥iv., E.); mix the powder in an earthen vessel with the acid, and add gradually seven parts (Ovj., E.) of water; agitate; digest for 3 days, adding water, that the materials may not become dry (and agitate continually, D.); then add seven parts (Ovj., E.) of boiling water, and strain through linen, washing with warm water, so as to remove all the acid; let the impurities subside, and evaporate the clear liquor to one half (to Ovj., E.); (let the impurities again settle, and the clear liquor poured off and heated to ebullition, E.); then add eight parts (sufficient to neutralize the acid, E.) of carbonate of soda, previously dissolved in boiling water; strain, and, by alternate evaporation and cooling, obtain crystals, which are to be kept in a close vessel (which, if requisite, may be purified by recrystallization, D.). (More crystals will be obtained by successively evaporating, adding a little carbonate of soda till the liquid exerts a feeble alkaline reaction on litmus paper, and then allowing it to cool, E.)"

Adulterations.—This salt is in general tolerably pure; if the precipitate occasioned in a solution by muriate of baryta be not entirely dissolved by nitric acid, a sulphate is present; and if that caused by nitrate of silver be not dissolved by nitric acid, a muriate is present.

Th. E.—A mild saline cathartic, resembling in its operation the sulphates of magnesia and soda, to both of which it should be preferred for children and delicate persons, in consequence of the mildness of its taste.

D. & M. or Adm.—ʒiv. to ʒxij.; it may be given dissolved in water or in any of the cathartic vegetable infusions; or it is readily taken by children dissolved in broth or soup, to which it only imparts a saline taste.

Incomp.—The mineral acids; lime-water; magnesia; chloride of barium; nitrate of silver, and the acetates of lead.

Sodæ et Potassæ tartras, D. E. Sodæ Potassio-tartras, L. *Tartrate of Soda and Potash; Rochelle salt.*

P. P.—This salt occurs in large, beautiful, transparent crystals, which are right rhombic prisms, generally produced in halves; inodorous, with a saline, somewhat bitter taste. Sp. gr., 1·757.

C. P.—It is composed of 1 eq. of soda, 1 of potassa, 2 of tartaric acid, and 10 of water (KO, Na O, $C^8H^4O^{10}$+10 HO). In very dry air it effloresces slightly; exposed to a moderate heat, it fuses in its water of crystallization; by a strong heat it is decomposed, and converted into a mixture of charcoal and the carbonates of soda and potash. It dissolves in five parts of cold, and one of boiling water.

Prep.—D. L. E. "Carbonate of soda, five parts (℥xij., L. E.); bitrartrate of potash, in fine powder, seven parts (℥xvj., L. E.); boiling water, fifty parts (Oiv., L. E.); to the carbonate of soda dissolved in the water, add by degrees (to neutralization, E.) the bitartrate of potash; evaporate the filtered liquor (till a pellicle forms on its surface, L. E.), and set it aside, that, as it cools, crystals may be formed. (Evaporate the liquor again, that it may yield crystals, L. E.)"

As this salt is generally sold in crystals, it is not liable to adulteration.

Th. E.—A mild, cooling laxative, not so active as most of the other saline cathartics, than which also its taste is less disagreeable; it is seldom prescribed alone, but is in very general use, as the active ingredient in the commonly-called Seidlitz (*Seignettes?*) powders.

D. & M. of Adm.—3ij. to 3vj. or 3i. dissolved in a large quantity of water. *Seidlitz powders* consist of 3ij. of tartrate of soda and potash, and ℈ij. of bicarbonate of soda, reduced to powder and mixed, contained in a blue paper, and 3ss. of powdered tartaric acid in a white paper; they are taken, dissolved in from half a pint to a pint of water, while the liquid is in a state of effervescence. They form an agreeable and mild aperient.

Incomp.—Most acids; lime-water; the salts of lime; and the acetates of lead.

Sodæ sulphas, D. L. E. *Sulphate of Soda. Glauber's salts.*

P. P.—A solid, white salt, crystallized either in small, acicular crystals, or in long prisms, of which the sides are often channelled; inodorous; with a cooling, saline, very bitter taste. Sp. gr., 2·246.

C. P.—It is composed of 1 eq. of soda, 1 of acid, and 10 of water (Na O, SO^3+10 Ho). By exposure to the air it effloresces rapidly, loses all its water of crystallization, and a white powder is left. Heated, it fuses, and at the temperature of 210° it becomes a white solid, which liquefies at a red heat, but is not decomposed. Sulphate of soda is soluble in three parts of water at 60°, and in all proportions in boiling water. It is insoluble in alcohol.

Prep.—*Dub.* "Dissolve the salt which remains after the distillation of muriatic acid in a sufficiency of boiling water; set aside the filtered liquor after due evaporation, that, as it cools, crystals may form." *Lond.* "Take of the salt which remains after the distillation of hydrochloric acid, lbij.; boiling water, Oij.; carbonate of soda, a sufficiency; dissolve the salt in the water; then add, gradually, sufficient carbonate of soda to neutralize the acid; boil down till a pellicle appears, and set

aside the strained solut on, tnat crystals may be formed; pour off the liquor and dry them." *Edin.* "Take of the salt which remains after making pure muriatic acid, ℔ij.; boiling water, Oiij.; white marble, in powder, a sufficiency; dissolve the salt in the water, add the marble so long as effervescence takes place, boil the liquid, and, when neutral, filter it; wash the insoluble matter with boiling water, adding the water to the original liquid; concentrate till a pellicle begins to form, and then let the liquid cool and crystallize."

Not subject to adulteration.

Th. E.—An active saline cathartic, increasing remarkably the intestinal secretions; in its mode of operation it resembles sulphate of magnesia, and may be used in the same cases; in consequence, however, of its more disagreeable taste, and its tendency, in some habits, to produce griping, it is not so frequently employed as that salt.

D. & M. of Adm.—3v. to 3x., dissolved in as many ounces of water; ten or twelve drops of dilute sulphuric acid added to the solution conceal much its disagreeable taste. The effloresced salt is about twice as active as the crystals.

Incomp.—Carbonate and bicarbonate of potash; the salts of lime and of baryta; the acetate and diacetate of lead; acetate of potash; and nitrate of silver, if the solution be strong.

Sulphur sublimatum, D. L. Sulphur, E. *Sublimed Sulphur. Sulphur or Brimstone.*—An elementary substance, found in large quantities, in an impure state, in the neighbourhood of volcanoes; it is also found combined with metals in many parts of the earth; and with hydrogen in many mineral waters. Crude sulphur is imported into Britain from Italy and Sicily.

P. P.—Two kinds of sulphur are commonly met with: roll sulphur, or brimstone; and flowers of sulphur, or sublimed sulphur. *Roll sulphur* is in cylindrical pieces from two to three inches long, and nearly an inch in diameter, obscurely crystallized in the centre, crackling when held in the warm hand, very friable, and breaking with a shining crystalline fracture. *Sublimed sulphur* is in the form of a fine powder, which, when examined by the microscope, is seen to be composed of crystalline grains: both kinds are of a bright, yellowish-green colour, with an almost imperceptible taste, and a faint, peculiar odour when rubbed. Sp. gr., 1·98. Atomic weight, 16·119.

C. P.—Sulphur is a simple substance, insoluble in water and in alcohol. It fuses at 226°, and between that temperature and 280° it forms a clear liquid of an amber colour; at 320° it thickens, assumes a reddish tint, and if the heat be continued, becomes a thick, tenacious mass; from 482° to its boiling point, 601°, it becomes again more fluid, and finally rises in vapour before it is completely fused. Sulphur, if ignited, burns with a lambent blue flame, and is converted into sulphurous acid gas.

Prep.—Sublimed sulphur is an article of the Materia Medica in the Dublin and London Pharmacopœias; in the Edinburgh it is directed to be prepared "by subliming sulphur in a proper vessel, washing the powder thus obtained by boiling water in successive portions till the water ceases to have an acid taste, then drying the sulphur with a gentle heat."

Adulterations.—Flowers of sulphur seldom contain any impurities; those of a fixed nature may be detected by subliming; if any adhering sulphuric acid be present, distilled water, agitated with the sulphur, reddens litmus paper. Roll sulphur usually contains a large quantity of orpiment (*sesquisulphuret of arsenicum*), and therefore should not be used in medicine.

Th. E.—In large doses, sulphur operates as a mild cathartic, producing its effects by stimulating the muscular coat of the intestines, the evacuations caused by it being usually solid. In consequence of the mildness, but certainty of its operation, it is generally employed in hœmorrhoidal diseases, and in stricture or other painful affections of the rectum. From being converted into sulphuretted hydrogen in the intestines, the evacuations, and the insensible perspiration of the individual, during and for some time after its operation, are insupportably fetid.

D. & M. of Adm.—As a cathartic, ʒiij. to ʒiv., made into an electuary with honey or treacle; it is usually given in combination with jalap and bitartrate of potash.—*Sulphur lotum*, D. "The sublimed sulphur of the shops washed with hot water to free it from any adhering acid, as indicated by litmus paper, and then dried on bibulous paper."

Tamarindus, D. L. E. *Tamarinds; Pulp of the legumes of Tamarindus Indica.*—A native of the East Indies, from whence it has been carried into Africa, where it now grows plentifully in Upper Egypt; it is also cultivated in the West Indian Islands, and in South America. It belongs to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Triandria.*

B. C.—A beautiful tree, about thirty feet in height, branching superiorly; leaves abruptly pinnate, alternate; flowers in terminal, pendant racemes, of a lemon-yellow colour. Fruit, a legume stalked, from three to four inches long, and nearly an inch broad, slightly compressed, 3–12 seeded; it is composed of a dry, brittle, brown shell, filled with a reddish acidulous pulp, in which are imbedded the smooth, quadrangular seeds.

P. U. & M. of Prep.—The pulp of the fruit; it is freed from the husk, and with the contained seeds is packed in layers in barrels, and boiling sirup poured over it; the drier and dark-coloured East Indian tamarinds are said to be preserved without sugar (*Pereira*).

P. P.—Tamarinds, as imported, are of a reddish-yellow colour (*West Indian*), or reddish-brown (*East Indian*), of the consistence of candied honey, being composed of the pulp, the seeds, and numerous vegetable fibres; they have a slightly vinous odour, and a sweet, very acid taste, somewhat astringent.

C. P.—Tamarind pulp is composed of citric, tartaric, and malic acids, bitartrate of potash, sugar, vegetable jelly, and parenchyma. It yields its properties to water, affording an acid solution.

Adulterations.—Tamarinds, as imported, frequently contain an appreciable quantity of copper; sulphuric acid is also sometimes added to tamarinds which have not been well preserved or too long kept, to give them an acid taste. The contamination with copper may be detected by plunging a plate of polished iron, as a knife, into the tamarinds, when, should any copper be present, it will

receive a coating of that metal. Sulphuric acid is readily detected by a strained decoction giving a white precipitate, insoluble in nitric acid, with solution of muriate or nitrate of baryta.

Th. E.—Tamarind pulp is refrigerant and mildly laxative, but, although adapted for mild febrile or inflammatory affections occurring in children, it is seldom employed alone. Its combinations with senna have been before mentioned.

D. & M. of Adm.—℥ss. to ℥iss.—Tamarind whey is prepared by boiling ℥i. of tamarinds with Oj. of new milk, and straining; it is an excellent cooling, gently laxative drink in febrile diseases.

Incomp.—The salts of potash; alkaline carbonates; lime-water; tartar emetic; and the acetates of lead.

Terebinthinæ oleum.—*Oil of turpentine* (described in the division Anthelmintics), given in large doses, acts as an active cathartic; when administered alone, however, its action is uncertain, and, consequently, it is usually prescribed in combination with castor oil; in this form it proves a most effectual purgative in obstinate constipation, especially when dependant on affections of the brain; in spasmodic diseases, as in chorea, hysteria, epilepsy, and tetanus; in sciatica and other neuralgic affections; in passive hœmorrhages; and in purpura hœmorrhagica; over the latter disease, independent of its cathartic action, it appears to possess some specific effect, when administered in large doses. The dose of oil of turpentine, as a cathartic, is from f℥ij. to f℥ij., either given by the mouth, or in the form of enema. (See *Anthelmintics.*)

Viola, D. E. *Flowers of Viola odorata.*—An indigenous plant, belonging to the natural family *Violaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—An humble, perennial creeper; leaves very numerous, cordate, nearly glabrous; runners flagelliform; flowers appearing in March and April, blue (after expansion turning deep purple), often white.

P. U. & M. of Prep.—The flowers; they are gathered as soon as they expand, and dried with a stove heat between folds of bibulous paper; their properties are best preserved in the form of the sirup of violets of the pharmacopœias.

P. P.—"Violet flowers are so remarkable for their odour and colour, that they have given a name to both" (*Duncan*).

C. P.—They are composed of odorous principle, blue colouring matter, sugar, gum, albumen, and some salts. Violets yield their active principles to water, but not to alcohol. The infusion is a delicate test for both acids and alkalies, and, as such, is much employed by the chemist.

Th. E.—Violet flowers possess mild laxative properties, and in the form of sirup are sometimes administered to new-born infants, and to young children.

D. & M. of Adm.—*Sirupus Violæ*, D. (Fresh petals of the violet, ℔ij.; boiling water, *by measure*, ℔v.; macerate for 24 hours, then strain through fine linen without expression, and add sugar, so as to make a sirup.)—E. (Fresh violets, ℔j.; boiling water, Oiiss.; pure sugar, ℔viiss.; infuse the flowers for 24 hours in a covered

glass or earthenware vessel; strain without squeezing, and dissolve the sugar in the filtered liquor.) Dose, f3i. to f3iv.—*Mel Violæ.* (Fresh violet flowers, one part; honey, five parts.) A mild laxative, readily taken by children; dose, 3i. to 3ss.

CHAPTER VI.

CAUSTICS.

(Escharotics.—Cauterants.—Catheretics.)

Caustics are substances which, applied to the human body, disorganize and destroy the parts with which they come in contact. Their action is chemical, as they destroy the life of the part, either by combining with the animal matter so as to form a new compound with it, or by causing the elements of the animal tissues to enter into new combinations, by which their cohesion is subverted and their composition changed. The effects produced by caustics are more or less rapid, according to the energy of the substance that is used; if it be very powerful, the change of structure produced is so immediate, that surrounding inflammation takes place only after the death of the part; but, on the contrary, inflammation is the direct consequence of the less energetic caustics. The action of this class of remedies is generally local, but some of them (as arsenious acid) may become absorbed, and thus produce constitutional symptoms. The various purposes for which caustics are employed will be considered under the individual remedies of this class.

Acidum aceticum, D. L. E. *Acetic acid.*

P. P.—A limpid, colourless liquid, with a very pungent, refreshing smell, and a caustic, highly acrid taste. The specific gravity differs in the three British Pharmacopœias: that of Edinburgh, which is the strongest, is 1·063 to 1·065, but not above 1·068·5; that of London, 1·048; and that of Dublin, 1·074.

C. P.—Acetic acid (*Edin.*), *Glacial acetic acid*, consists of one eq. of anhydrous acetic acid ($C^4H^3O^3$), and one of water; it crystallizes at 60°, and is vaporizable at 260°; when of the density 1·063, one hundred minims (97 grains) neutralize nearly 242 grains of crystallized carbonate of soda. Acetic acid (*Dub.*) consists of one eq. of anhydrous acetic acid and three of water; 100 grains neutralize nearly 184 grains of carbonate of soda. Acetic acid (*Lond.*) consists of one eq. of anhydrous acid and thirteen of water; 100 grains neutralize 87 grains of crystallized carbonate of soda. Acetic acid reddens litmus paper, and its vapour fumes with ammonia; it combines with many of the metallic oxydes, forming crystallizable salts; it dissolves the vegetable alkaloids, and also the active principles of many of the vegetable medicines, both which properties are taken advantage of in pharmacy.

Prep.—*Dub.* "Acetate of potash, 100 parts; sulphuric acid, 52 parts; to the acid, poured into a tubulated retort, add gradually the acetate of potash, waiting after each addition until the mixture cools; then with a moderate heat distil the acid to dryness." *Lond.* "Acetate of soda, ℔ij.; sulphuric acid, ʒix.; water, fʒix.; add the sulphuric acid, first mixed with the water, to the acetate of soda put into a glass retort; then let the acid distil from a sand-bath; care is to be taken that the heat be not too great towards the end." *Edin.* "Take of acetate of lead any convenient quantity, heat it gradually in a porcelain basin, by means of a bath of oil or fusible metal (8 tin, 4 lead, 3 bismuth), to 320° F., and stir till the fused mass concretes again; pulverize this when cold, and heat the powder again to 320°, with frequent stirring, till the particles cease to accrete; add ʒvi. of the powder to fʒixss. of pure sulphuric acid, contained in a glass matrass; attach a proper tube and refrigeratory, and distil from a fusible metal bath with a heat of 320°, to complete dryness. Agitate the distilled liquid with a few grains of red oxyde of lead to remove a little sulphurous acid, allow the vessel to rest for a few minutes, pour off the clear liquid, and redistil it."

[U. S. P.—Acetate of soda, ℔j.; sulphuric acid, ℔ss.; red oxyde of lead, a drachm; pour the sulphuric acid into a glass retort, and gradually add the acetate of soda; then, by means of a sand-bath, distil with a moderate heat into a glass receiver, till the residuum becomes dry. Mix the resulting liquid with the red oxyde of lead, and again distil with a moderate heat to dryness.]

[*Acidum aceticum dilutum* is prepared by mixing one part of acetic acid to 10 parts of distilled water, U. S. P.]

Adulterations.—It should be of the prescribed density; if lighter, it probably does not contain sufficient of the anhydrous acid, but, as before remarked with respect to vinegar, this test cannot be depended on; the strength can be more accurately ascertained by its neutralizing power over carbonate of soda. It is sometimes adulterated with sulphuric or muriatic acid; the former may be detected by the production of a white precipitate insoluble in nitric acid, on the addition of solution of muriate or nitrate of baryta; the latter, by a similar precipitate being produced on the addition of solution of nitrate of silver. The occasional impregnation with lead or copper is readily detected by sulphuretted hydrogen causing a black precipitate.

Th. E.—Acetic acid undiluted has been used, it is stated, with much success, as a local application in the advanced stages of porrigo, impetigo, or eczema of the scalp; a piece of lint rolled round a stick is moistened with the acid and applied to the diseased surface for a few seconds; the pain caused is very acute, but temporary; one or two applications are said to be usually sufficient to effect a cure. It is also employed as a caustic to destroy corns and warts, the latter especially, when of a syphilitic origin.

Acidum muriaticum, D. E. [and U. S. P.] Acidum hydrochloricum, L. *Muriatic acid; Hydrochloric acid.*

P. P.—A limpid, colourless liquid, with a yellowish tinge when not quite pure, having a suffocating odour, and an intensely acid, disagreeable taste. The specific gravity of the liquid acid of the Dublin and London Pharmacopœias is 1·160; that of Edinburgh, 1·170.

C. P.—It is a solution of muriatic acid gas (HCl.) in water; the Dublin and London preparation contains about 32 per cent. of real acid, the Edinburgh about 34 per cent. Exposed to the air, muriatic acid emits suffocating fumes, which become white in contact

with the vapour of ammonia; it possesses the usual characteristics of a strong acid.

Prep.—*Dub.* "Dried muriate of soda, 100 parts; commercial sulphuric acid, 87 parts; water, 124 parts; mix the acid with half the water, and when cold pour it on the muriate of soda in a glass retort, put the rest of the water into the receiver, annex the retort, so that the gas may be absorbed by the water, and distil to dryness." *Lond.* "Chloride of sodium, dried, ℔ij.; sulphuric acid, ℥xx.; distilled water, f℥xxiv.; add the sulphuric acid, first mixed with f℥xij. of the water, to the chloride of sodium put into a glass retort, pour what remains of the water into a receiver, and, the retort being fitted to it, let the acid, distilled from a sand-bath, pass over into this water, the heat being gradually increased." *Edin.* "Purify muriate of soda by dissolving it in boiling water, concentrating the solution, skimming off the crystals as they form on the surface, draining from the adhering solution, and washing the crystals slightly with cold water; take of this salt, previously well dried, of pure sulphuric acid and of water, equal weights; put the salt into a glass retort, and add the acid, previously diluted with a third part of the water, and allowed to cool; fit on a receiver which contains the rest of the water, distil with a gentle heat by means of a sand-bath, or a naked coal-gas flame, so long as any liquid passes over, preserving the receiver cool by snow or a stream of cold water."

Adulterations.—It should be of the prescribed density, that being a perfect test of its strength; it is frequently contaminated with iron and with chlorine, to the presence of either, or both of which, is due the yellow colour of the impure acid; the former may be detected by solution of ferrocyanate of potash producing a blue precipitate with the neutralized acid; the latter, by the acid dissolving leaf gold. The presence of sulphuric acid, an occasional impurity, is indicated by the solution of nitrate or muriate of baryta occasioning a white precipitate in the acid previously diluted.

Th. E.—As a caustic, muriatic acid has been used with much success to destroy the false membranes which are formed in diphtheritis, to check the spreading of the mortification in cancrum oris, to obstinate ulcers of the tongue, and in phagedenic ulceration of the tonsils. It has been also employed as an external application in hospital gangrene. It may be applied by means of a piece of sponge attached to a bit of whalebone.

In cases of poisoning with this acid, the antidotes are chalk, and magnesia or its carbonate, combined with demulcent and emollient drinks.

Acidum nitricum, D. L. E. *Nitric acid.*

P. P.—A dense, colourless liquid (when not quite pure having an orange hue), with a powerful, disagreeable odour, and an intensely acid, caustic taste. The specific gravity of the acid of the Dublin Pharmacopœia is 1·490; that of London and Edinburgh, 1·500.

C. P.—It is composed of anhydrous nitric acid (NO^5) and water; the Dublin preparation contains about 77 per cent. of real acid, the London and Edinburgh about 80 per cent. Nitric acid emits white fumes in the air, which become much denser when mixed with the vapour of ammonia. It stains the cuticle orange or yellow, and destroys whatever animal tissues it comes in contact with; it possesses the usual characteristics of a strong acid. The best test for distinguishing nitric acid from the other mineral acids is

its action on morphia or its salts, which it immediately turns deep orange.

Prep.—*Dub.* "Nitric acid, 100 parts; commercial sulphuric acid, 97 parts; mix in a glass retort, and distil into a receiver fitted with an apparatus for receiving the elastic gas, until the residuum in the retort concretes and again liquefies." *Lond.* "Nitrate of potash, dried, and sulphuric acid, of each, ℔ij.; mix in a glass retort, then let the acid distil in a sand-bath." *Edin.* "Purify nitrate of potash, if necessary, by two or more crystallizations, till nitrate of silver does not precipitate its solution in distilled water; put into a glass retort equal weights of this purified salt and of sulphuric acid, distil into a cooled receiver with a moderate heat from a sand-bath or naked gas-flame, so long as the fused material gives off vapour; the pale yellow acid thus obtained may be rendered colourless, should this be desired, by heating it gently in a retort."

Any slight adulterations which are met with in nitric acid are unimportant with reference to its medicinal use.

Th. E.—As a caustic, strong nitric acid is employed to destroy corns and warts, as an application to parts bitten by rabid animals, to poisoned wounds, and to phagedenic ulcers; more recently its application to certain forms of hæmorrhoids has been very favourably mentioned by Dr. Houston, of Dublin. (See *Dublin Journal of Medical Science*, vol. xxiii., p. 102.) In its application for any of the above purposes, the neighbouring parts should be smeared with olive oil or some resinous ointment, so as to confine the action of the acid.

In cases of poisoning with this acid, the antidotes are the same as for muriatic acid.

Acidum sulphuricum. *Sulphuric acid* (described in the division Astringents) also possesses powerfully caustic properties, destroying the animal tissues wherever it is brought in contact with them. It is used as a caustic to the integument of the eyelid in *entropium*, or inversion of the lid; and to the conjunctiva reflected on the eyelid in *ectropium*, or eversion of the lid. It is also employed to destroy warts, and as an application to poisoned wounds.

Ammoniæ aqua fortior, E. Ammoniæ liquor fortior, L. *Concentrated aqueous solution of ammonia; Strong ammonia.*—This preparation resembles in its physical properties that already described in the division Antacids; in its chemical properties, it only differs in containing more ammonia, its density being 880°. In the London Pharmacopœia, it is an article of the Materia Medica; in the Edinburgh, the same process is followed for both solutions; it is not contained in the Dublin Pharmacopœia, but is commonly kept in the shops. It has been only used as a caustic in the bites of rabid animals, as a local application.

Antimonii murias; Antimonii sesquichloridum. *Muriate or Sesquichloride of Antimony; Butter of Antimony.*—The muriate of antimony is a deliquescent white salt, but, as it is not employed in medicine, the following description refers to the article commonly met with in the shops under that name.

P. P.—A transparent liquid, of a deep reddish-yellow colour,

having the odour of muriatic acid, and a strongly acid, caustic taste. Sp. gr., 1·2 to 1·5.

C. P.—It is composed of muriate of antimony, free muriatic acid, a little nitrous acid, muriate of iron, and water. It emits white fumes in the air; left exposed, it evaporates spontaneously, leaving as a residuum a white, semi-crystalline mass; mixed with water, it throws down a yellowish-white powder, formerly called *Powder of Algaroth* (oxychloride of antimony). Solution of muriate of antimony has a powerfully acid reaction.

Prep.—Either by dissolving sesquisulphuret of antimony (*Cinis antimonii*) in muriatic acid, and adding pernitrate of iron as colouring matter; or by dissolving crude antimony in muriatic acid with the aid of a little nitric acid.

Th. E.—It is employed as a caustic to parts bitten by rabid animals, its liquidity enabling it to penetrate into all parts of the wound; the parts should be first dried as well as possible with pieces of lint, as all liquids immediately decompose this preparation. Pure muriate of antimony has been used as an application to staphyloma by some German surgeons; a camel's-hair pencil or a point of lint is dipped in the deliquescent salt and applied to the tumour until a whitish crust is perceived, when the whole is washed away by means of a large pencil dipped first into milk and afterward into milk and water.

In cases of poisoning with this solution, the same treatment should be employed as in poisoning with muriatic acid.

Argenti nitras, L. E. Argenti nitras fusum, D. Argenti nitratis crystalli, D. *Nitrate of Silver; Lunar Caustic.*

P. P.—A solid salt in the form of rods or pencils, smooth and polished on the surface, of the thickness of a writing pen. They have a crystalline fracture, and are of a grayish-slate colour, inodorous, with a bitter, caustic, and metallic taste.

C. P.—Nitrate of silver is composed of one eq. of nitric acid, and one of oxyde of silver (AgO, NO^5). It is not deliquescent; it is soluble in its own weight of water at 60°, and in four parts of rectified spirit; heated, it fuses, and by a red heat is decomposed, and metallic silver is obtained. Exposed to light in contact with the smallest trace of organic matter, it becomes brown or blackish. It stains the cuticle black. The best test for nitrate of silver in solution is the addition of any of the soluble muriates (as muriate of soda); a white curdy precipitate is formed, which becomes black by exposure to strong light, and is soluble in ammonia, but not in either cold or boiling nitric acid.

Prep.—"Take of silver (flattened into plates and cut, D.), 37 parts (℥iss., L. E.); nitric acid (dilute, D.), 60 parts (f℥j., L. E.); (distilled water, f℥ij., L. E.;) dissolve the silver in the diluted acid, in a glass vessel, with the aid of a gentle heat, and evaporate to dryness; liquefy this in a crucible with a slow fire, and pour into proper moulds (into iron moulds previously heated and greased slightly with tallow, E.); preserve in glass vessels." The crystallized nitrate, D., now never used, is prepared as the fused salt, but crystallized by evaporation and cooling.

Adulterations.—Nitrate of silver, as met with in commerce, is frequently adulterated with nitrates of potash, lead, zinc, and cop-

per, and with black oxyde of manganese. The latter is detected by dissolving the salt in water, when it is left in the form of a black powder; the nitrates of lead, zinc, and copper are detected by precipitating a solution of the salt with excess of muriate of soda; the precipitate is not entirely soluble in ammonia if lead be present, and the liquid part gives with sulphuretted hydrogen a white precipitate if any zinc was present, but a black one if the impurity was copper. Nitre is detected by precipitating the silver with muriatic acid, filtering and evaporating, when, if any be present, it will be obtained in the crystalline state.

Th. E.—As a caustic, nitrate of silver possesses many advantages over the other remedies of this class, and, consequently, is much more frequently employed; applied to the skin or to the mucous membranes, it produces first a whitish stain, rapidly becoming grayish, and, if exposed to light, finally black; and, at the same time, the part to which it is applied is deprived of vitality. Its chief value as a caustic depends on its great manageableness in consequence of its solid form, on its property of not deliquescing, and on its mild, but effectual action, the pain produced by it, although sometimes acute, being but of short duration; its uses are very numerous. It is applied to destroy warts, corns, and many small tumours; to check hœmorrhage occurring from small vessels, as in the bleeding from leech-bites in children; to repress exuberant granulations; applied to the sound skin above the inflamed part, to stop the spread of erysipelas and erythema, to effect which it must be applied freely, so as to destroy the rete-mucosum as well as the cuticle. In the first stage of chancre, when the ulcer is very minute, nitrate of silver applied freely generally checks the disease, and prevents it from spreading farther; indeed, in all sores about the prepuce or glans, whether of syphilitic origin or not, its application is for the most part beneficial. In large indolent ulcers, applied over the whole surface, it acts with excellent effect; in many instances, as soon as the eschar which it produces peels off, the sore is found to be healed. As a topical application, in the solid state or in the form of a strong solution, it is most valuable in ulcerations of the cornea, in purulent and in gonorrhœal ophthalmia; a weaker solution (gr. ij. to gr. v. to f℥i. of water) may be employed in both acute and chronic conjunctivitis; it is, however, liable to produce specks on the cornea or dark stains on the conjunctiva, as first observed by Professor Jacob, of Dublin. Nitrate of silver has also been used in the solid state to remove strictures of the urethra and œsophagus, applied by means of a bougie, into the point of which it is inserted (*armed or caustic bougie*); but the practice is dangerous. In gonorrhœa occurring in females, a pencil of nitrate of silver is applied freely to the mucous membrane of the vagina, it is said with much benefit; and in the same disease in males, an injection, varying in strength from gr. ij. to gr. xx. dissolved in f℥j. of water, is injected into the urethra; such treatment, however, is not unattended with danger. Nitrate of silver is also employed with benefit, as a topical application, in many forms of ulcerations of the

gums, the tongue, and the fauces; in excoriations of the nipples, in the chronic stages of eczema, impetigo, and porrigo of the scalp; and in the acute stage of herpes preputialis and herpes labialis.

ARSENICI OXYDUM ALBUM, D. ACIDUM ARSENIOSUM, L. ARSENICUM ALBUM, E. *White oxyde of Arsenicum; Arsenious acid; Arsenic.*

P. P.—In large, vitreous cakes or masses, whitish, sometimes having a yellow tinge; transparent, but, on exposure to the air, soon becoming opaque like enamel, the opacity gradually extending to the centre of the masses; the cakes are moderately hard, and brittle. Arsenic is inodorous; it has a faintly sweetish taste, not acrid or corrosive, as it has been described by many. The specific gravity, when transparent, is 3·738; and when opaque, 3·699.

C. P.—It is composed of 1 eq. of the metal arsenic, and three eq. of oxygen (As O^3). Exposed to a heat of 380° F., it sublimes unchanged, and as it cools condenses into small transparent crystals of adamantine lustre, which are regular octohedrons. At ordinary temperatures, water dissolves from an 800th to a 400th of its weight of powdered arsenious acid; boiling water dissolves nearly a ninth of its weight, and on cooling to 60°, retains a 35th (Christison). The solution reddens litmus paper slightly. The chemical characteristics of arsenious acid are as follows: thrown on red-hot charcoal or cinders, it evolves a scarcely visible vapour, metallic arsenic, which has a strong alliaceous odour, and which, at the distance of a few inches from the charcoal, is converted into a dense white, odourless smoke, arsenious acid; heated with carbonaceous matter in a glass tube, it is reduced and the metal sublimed, forming a grayish-black ring in a cooler part of the tube, and which, by the application of heat to the outside of the glass, is resublimed in the form of arsenious acid; its solution precipitates lemon-yellow with ammoniacal nitrate of silver, grass-green with ammoniacal sulphate of copper, and sulphur-yellow with sulphuretted hydrogen; put into a proper apparatus, as Marsh's test tube, or a Dobereiners lamp, with zinc and sulphuric acid, arseniuretted hydrogen will be evolved, which, being ignited as it passes through the fine aperture of the exit tube, deposites metallic arsenic on a plate of glass or porcelain held in the flame, and arsenious acid if held a little above the flame.

PREP.—Arsenious acid is an article of the Materia Medica; it is prepared by roasting metallic ores in which the metal is contained, especially the arseniuret of cobalt, in a reverberatory furnace to which is attached a long chimney in a horizontal direction; it is deposited on the floor of the chimney, in the form of a gray powder, which is refined by sublimation. The Dublin College directs a second sublimation for medical purposes, which, however, is not required, in consequence of the good quality of what is met with in commerce in the present day.

Adulterations.—Arsenious acid seldom contains any impurity; as sold in the form of powder, it is sometimes adulterated with chalk or sulphate of lime, or may accidentally contain a little oxyde of iron; any of them may be detected by the application of heat, which sublimes the acid and leaves the impurity.

Th. E.—Arsenious acid is a powerful caustic, producing death of the part to which it is applied, which subsequently separates by sloughing; in consequence, however, of the danger which may occur from its absorption, it is but seldom employed at present. The cases in which it has been found of use are, malignant or cancerous ulcerations, especially of the skin of the face, in lupus, in onychia maligna, and in hospital gangrene. It may be applied in the form of ointment made with axunge or spermaceti, powdered opium being added to allay the pain it causes. It is stated that dangerous symptoms are less likely to arise in consequence of its absorption, if an ointment containing a tenth or a sixth of its weight of the acid be employed, than if a weaker preparation be used.

Cupri subacetas, D. [and U. S. P.] Ærugo, L. E. *Subacetate of Copper; Verdigris; Impure diacetate of Copper.*

P. P.—In coarse masses or in powder, of a beautiful bluish-green colour, with a disagreeable, acetous odour, and a styptic, metallic taste.

C. P.—It is a mixture of the sesqui and tribasic acetates of copper, sometimes also containing a proportion of the bibasic acetate. It is permanent in the air; heated, it first loses water, then acetic acid, and the residue contains metallic copper; water resolves it into a soluble acetate, and an insoluble trisacetate. It is dissolved entirely by both sulphuric and muriatic acids.

Prep.—An article of the Materia Medica, obtained by placing plates of copper in contact with the fermenting marc of the grape, or with cloths dipped in vinegar. The Dublin College directs this article to be prepared for medical use (*Cupri subacetas præparatum*) by a process similar to that for prepared chalk.

Adulterations.—The slight impurities, metallic copper or earthy matters, present in commercial verdigris, are of no importance; they may be detected by its solubility in sulphuric or muriatic acid.

Th. E.—As a caustic, it is applied to indolent ulcers, to venereal warts, and to fungous growths; it is also a useful application in ophthalmia tarsi; and in chronic diseases of the scalp, when they are of an indolent and obstinate character. It may be used in powder, or in either of the following forms: *Unguentum cupri subacetatis*, D. *Unguentum æruginis*, E. (Subacetate of copper, in fine powder (prepared, D.), ʒss. (ʒi., E.); ointment of white resin, ℔j. (ʒxv., E.); (olive oil, ʒi., D.); melt the ointment, and add the verdigris, "previously mixed with the oil," D.)—*Linimentum æruginis*, L. *Oxymel cupri subacetatis*, D. (Verdigris, in powder, ʒi.; vinegar, fʒvij.; honey (despumated), ʒxiv.; dissolve the verdigris in the vinegar, strain through a linen cloth; add the honey, and boil to a proper consistence.) A mild caustic, used for venereal ulcers of the mouth and tonsils.

In cases of poisoning with verdigris, the best antidote is albumen.

Cupri carbonas. *Carbonate of Copper.*—This preparation, obtained by precipitating a solution of sulphate of copper with carbonate of soda, though not contained in any of the British pharmaco-

pœias, deserves a short notice, in consequence of the success obtained from its use in the chronic forms of impetigo and eczema of the scalp, by M. Devergie, in the *Hôpital Saint Louis* at Paris; he employs it in the form of ointment, prepared by mixing intimately ʒij. of the powder with ʒi. of axunge.

Cupri sulphas.—*Sulphate of Copper* (described in the division Astringents) is used in the solid state as a caustic, to repress excessive granulations, to destroy venereal warts, and to excite a new action in indolent, ill-conditioned ulcers; it is also applied with much benefit to chancres in their early stage.

Hydrargyri oxydum nitricum, D. Hydrargyri nitrico-oxydum, L. Hydrargyri oxydum rubrum, E. *Nitric oxyde of Mercury; Red oxyde of Mercury; Red precipitate.*

P. P.—In brilliant, micaceous masses, varying in colour from orange-yellow to bright scarlet; inodorous, with a taste at first faintly, then strongly, caustic and metallic. Sp. gr., 11·074. In fine powder, its colour is yellow.

C. P.—It is composed of 1 eq. of mercury, and 1 of oxygen (Graham), generally containing a little undecomposed nitrate of mercury; exposed to a red heat, the oxyde of mercury is entirely volatilized in the form of oxygen and metallic mercury. It is very sparingly soluble in water, boiling water dissolving about a 7000th of its weight. It is very soluble in muriatic, acetic, and hydrocyanic acids; but is insoluble in alcohol.

Prep.—*Dub.* "Purified mercury, two parts; dilute nitric acid, three parts; dissolve the mercury, and increase the heat until the dry material is converted into red scales." *Lond.* "Mercury, ℔iij.; nitric acid, ℔iss.; distilled water, Oij.; mix in a proper vessel, and with a gentle heat dissolve the mercury; boil away the liquor, and pulverize the residuum; put this into a shallow vessel, and apply a gentle heat, gradually increasing until red vapour ceases to arise." *Edin.* "Mercury, ʒviij.; dilute nitric acid (D., 1280), fʒv.; dissolve half the mercury in the acid with the aid of a gentle heat, and continue the heat until a dry white salt be left; triturate the rest of the mercury with the salt till a fine uniform powder be obtained; heat the powder in a porcelain vessel, and constantly stir it, till acid fumes cease to be disengaged."

Adulterations.—The nitric oxyde of mercury sometimes contains nitric acid, which is looked upon by the London and Edinburgh Colleges as an impurity; its presence is indicated by the ruddy fumes evolved when the salt is heated; it is often adulterated with red oxyde of iron, red oxyde of lead, or brick-dust; they may be all detected by exposing the salt to a red heat; if pure, it is entirely sublimed.

Th. E.—As a mild caustic, this preparation is applied to indolent ulcers, to spongy granulations, to venereal warts, to the eyelids in chronic inflammation of their edges, &c. It may be used in powder, or in ointment, as follows: *Unguentum hydrargyri oxydi-nitrici*, D. L. (Nitric oxyde of mercury, ʒi.; white wax, ʒij.; prepared lard, ʒvj.; add the oxyde in very fine powder to the wax and the lard melted together, and mix intimately.)—*Unguent. oxy-*

di hydrargyri, E. (Red oxyde of mercury, ʒi.; axunge, ʒviij.; triturate them into a uniform mass.)

Potassa caustica, D. Potassæ hydras, L. Potassa, E. *Caustic Potash; Hydrate of Potash; Potash.*

P. P.—In flat, irregular pieces, or, more generally, in pencils or sticks of various lengths, and about the thickness of a writing pen; grayish or bluish; inodorous, having a very acrid, alkaline taste. Sp. gr., 1·8.

C. P.—It is composed of 1 eq. of potassium, 1 of oxygen, and 1 of water (KO+HO); exposed to the air, it deliquesces rapidly, soon becoming liquid, and attracting carbonic acid; at the same time it is converted into the carbonate. It is soluble both in water and alcohol, water dissolving nearly an equal weight of it; during its solution heat is evolved. It possesses in an eminent degree the properties of an alkali.

Prep.—"Evaporate any quantity of solution of potash in a clean iron or silver vessel, until the heat being increased, an oily-looking fluid is left, a drop of which, when removed on a glass rod, becomes hard on cooling. Pour the liquid on an iron or silver plate, and as soon as it solidifies, cut it into pieces (pour the liquid into proper moulds, L.), and preserve in well-closed bottles."

Adulterations.—It generally contains various impurities, such as oxyde of iron, silica, and sulphates and carbonates of potash; their presence, however, are of little consequence in reference to its medical uses. The iron and silica may be detected by dissolving in water or in alcohol; the sulphates and carbonates by the appropriate tests for sulphuric and carbonic acids.

Th. E.—Caustic potash is a powerful caustic, but so unmanageable, in consequence of its deliquescent property, that it is not often employed. Its chief use is for making an issue, which is effected by covering the part with two or three layers of adhesive plaster, in the centre of which an aperture is cut of the size of the intended issue; the caustic potash is rubbed on the part until the surface is destroyed; a linseed meal poultice is then applied, and when the slough separates a pea is inserted. For producing issues, however, the following preparation is preferred by many, as being more manageable, in consequence of its not being so deliquescent: *Potassa cum calce*, D. E. (Evaporate any convenient quantity of Aqua Potassæ in a clean, covered, iron vessel, to one fourth (one third, E.) its volume; and add slacked lime, till the fluid has the consistence of a firm pulp; preserve in well-closed vessels.)—L. (Hydrate of potash and lime, of each, ʒi.; rub together and keep in a well-stopped vessel.) The preparation of the London College is made into a paste with rectified spirit before it is used.

In cases of poisoning with caustic potash, the best antidotes are vinegar, lemon-juice, or the fixed oils.

Zinci chloridum. *Chloride of Zinc; Butter of Zinc.*

P. P.—In solid pieces, snow-white; inodorous, having a strongly styptic, metallic taste.

C. P.—It is composed of 1 eq. of chlorine, and 1 of metallic zinc

(Zn Cl); exposed to the air, it deliquesces rapidly, being said by many chemists to be the most deliquescent of salts. It is fusible at 212°, and is volatilized at a red heat. It is soluble in water, alcohol, and ether.

Prep.—By dissolving metallic zinc in muriatic acid, with the aid of a little nitric acid, evaporating to dryness in a porcelain capsule, dissolving the chloride thus obtained in water, adding a small quantity of prepared chalk, filtering after 24 hours' rest, and evaporating to dryness; the product must be preserved in well-stopped bottles.

Th. E.—Chloride of zinc is a powerful caustic, destroying the vitality of the part with which it is placed in contact; the process being attended with violent burning pain, which lasts for five or six hours. It has not been much employed in this country, but on the Continent it is in very general use, for the formation of issues, to destroy fungous growths, *nævi materni*, &c.; and as an application to open cancer, in which disease it is said to be productive of the best effects, by inducing a new action in the neighbouring parts; it has also been applied to fungous hæmatodes, and to various forms of malignant ulcerations. It may be used in the form of lotion, prepared by dissolving the salt in distilled water in different proportions, according to the effect required to be produced; or in the form of paste, made by mixing the chloride with from two to five parts of flour.

CHAPTER VII.

DIAPHORETICS.

(Sudorifics—Diapnoïcs.)

Medicines which augment the cutaneous exhalation are called Diaphoretics; when they increase it to such a degree as to produce sweating, they are called Sudorifics; but as the same remedies are capable of producing both effects, which differ only in degree, we have included them under the one title. Obstructed perspiration, or diseases in which diaphoresis will prove useful, may be associated with fever and inflammation, or may occur with a slow, languid circulation; the former is indicated by the morbid heat of the surface of the body and the increased vascular action; the latter, by the coldness of the surface and the general depression of the circulation. It is evident, therefore, that very different remedies will act as diaphoretics in those opposite states of the system. In the former case, those medicines are to be selected for use which appear to act by relaxing the morbid constriction of the cutaneous capillaries, and, at the same time, have a direct tendency to lower the action of the heart and arteries; such as *antimonials, and the alkaline and saline diaphoretics.* In the latter, those remedies are to be employed which act as stimulants to the cutaneous capilla-

ries, and, at the same time, increase the general action of the vascular system. In addition to the medicines described in this division, other means are resorted to for the production of diaphoresis; the more important of these are increased muscular action, warm water and warm vapour or air baths, the cold affusion, and the use of tepid, diluent drinks, as simple water, gruel, whey, &c. During the administration of diaphoretics, it is essential that the surface of the body should be kept warm, and for this purpose a bad conductor of heat, such as flannel, should be employed; care must also be taken to avoid the application of cold, either by exposing the surface of the body to cold air, or by the use of cold drinks while the perspiration continues, or for some time after it has ceased; lastly, where it is wished to check the diaphoresis, this must be done gradually, by drying the surface of the body with dry, warm towels, by diminishing the covering, and by cautiously exposing the hands and arms to the air.

[This class of remedies, when successfully employed, act by promoting the watery exhalation from the *lungs* as well as the *skin*, the former being as perpetual a source of this exhalation as the latter. Pathologists, however, seldom appear to recognise the pulmonary transpiration when considering the cutaneous exhalation, though both are governed by the same laws and connected by common sympathies, being simultaneously augmented or diminished. And yet physiologists have demonstrated that more than a third part of the aggregate exhalation from the human body is thrown off by the pulmonary surface, the extent of which is incalculably greater. There are numerous diseases in which the only curative indication consists in restoring exhalation from these two sources, which is often suspended, as in diabetes, and other examples of inordinate secretion of fluid from the other emunctories.]

Ammoniæ acetatis aqua, D. E. Ammoniæ acetatis liquor, L. *Solution of acetate of Ammonia; Mindererus Spirit.*

P. P.—A transparent, colourless liquid, with a very faint odour, and a cooling, saline taste. The specific gravity varies with the strength of the solution; that of Dublin and Edinburgh is 1·011: that of London somewhat higher.

C. P.—It consists of acetate of ammonia dissolved in water; the proportion of the acetate present varies exceedingly, depending on the strength of the distilled vinegar employed in the preparation. The solution should be perfectly neutral, but is usually faintly acid, which is an advantage in relation to its employment in medicine. By careful evaporation, crystals of the salt may be obtained; they are very deliquescent. By adding a few drops of sulphuric acid to the solution, an acetous odour is evolved; caustic potash disengages an ammoniacal odour.

Prep. — *Dub.* "Carbonate of ammonia, one part; add by degrees, frequently agitating, sufficient warm distilled vinegar to saturate the ammonia, that is, about 30 parts; this may be determined by means of litmus." *Lond.* "Sesquicarbonate of ammonia, ℥ivss., or a sufficiency; distilled vinegar, Oiv.; add the salt to the vinegar to saturation." *Edin.* "Distilled vinegar, from French vinegar in prefer-

ence, f℥xxiv.; carbonate of ammonia, ℥i.; mix, and dissolve the salt; if the solution has any bitterness, add by degrees a little distilled vinegar, till that taste be removed; the density of the distilled vinegar should be 1·005, and that of the aqua acetatis ammoniæ, 1·011."

Adulterations.—This solution seldom if ever contains any impurity; the London and Edinburgh Colleges, nevertheless, have given tests for detecting the presence of metallic matter, and sulphuric or muriatic acids: the metals, by sulphuretted hydrogen; and the acids, the former by muriate of baryta, the latter by nitrate of silver. The solution should be perfectly colourless, and of the prescribed density.

Th. E.—Aqua acetatis ammoniæ operates as a diaphoretic with much certainty, and is very generally employed with that intention in febrile and inflammatory affections. Its operation should be promoted by the use of warm drinks and by the surface of the body being kept warm, as otherwise it is apt to pass off by the kidneys. This solution possesses the advantage of not exciting the circulation in any considerable degree, a property which renders it peculiarly adapted for febrile diseases.

D. & M. of Adm.—f℥ss. to f℥i., or f℥ij., repeated every five or six hours.—*Diaphoretic mixture.* (Solution of acetate of ammoniæ, f℥ij.; simple sirup, f℥j.; orange-flower water, f℥i.; camphor mixture, f℥iv.; mix.) Dose, f℥j., every four hours.

Incomp.—Acids; potash and soda, and their carbonates; lime-water; nitrate of silver; and acetate of lead.

Antimonii oxydum, E. Antimonii oxydum nitromuriaticum, D. *Sesquioxyde of Antimony; Nitromuriatic oxyde of Antimony.*

P. P.—A heavy white powder, sometimes semi-crystalline; inodorous, having a disagreeable metallic taste as prepared according to the Dublin Pharmacopœia, in consequence of adhering chloride of antimony, but perfectly tasteless when freed from chlorine.

C. P.—It is composed of 1 eq. of antimony and 3 of oxygen ($Sb O^3$), Graham; with some adhering chloride of antimony in the Dublin preparation. It is permanent in the air; exposed to heat, it becomes yellow, and fuses at a red heat, concreting slowly, as it cools, into a crystalline mass; by a stronger heat it is sublimed in white vapours, which condense in the form of crystalline needles. Oxyde of antimony is insoluble in water; the greater part, but not all, of the adhering chloride may be removed from the nitromuriatic oxyde by repeated washing with water; washed with a weak solution of carbonate of soda, it may be completely freed from it. It is soluble in muriatic, tartaric, and acetic acids.

Prep.—*Dub.* "Prepared sulphuret of antimony, 20 parts; muriatic acid, 100 parts; nitric acid, 1 part; add the sulphuret gradually to the acids, previously mixed in a glass vessel; digest with a gradually-increased heat, till the mixture ceases to effervesce, then boil for an hour; pour the cooled and filtered liquor into a gallon of water; when the oxyde shall have subsided, wash with a large quantity of water, till the washings cease to redden litmus paper; finally, dry the oxyde on bibulous paper." *Edin.* "Sulphuret of antimony, in fine powder, ℥iv.; muriatic acid (commercial), Oj.; water, Ov.; the process is the same, but the precipitated oxyde is washed with a weak solution of carbonate of soda."

Adulterations.—Not liable to any; that it has been properly prepared is shown by the tests of the Edinburgh Pharmacopœia. "Entirely soluble in muriatic acid, and in a boiling mixture of bi-tartrate of potash and water; fusible at a red heat."

Th. E.—Originally introduced into the Dublin Pharmacopœia only for the preparation of tartar emetic; but of late years it has been used as a diaphoretic in the same cases as James's powder, which it appears to resemble much in its action on the system, and which is explained in the next article.

D. & M. of Adm.—Gr. iij. to gr. x.; in some instances so large a dose as ʒss. has proved inert; this, however, may be owing to faulty preparation. It may be given in the form of pill made with conserve of roses.

Antimonii pulvis compositus, L. Pulvis antimonialis, D. E. *Antimonial powder.*

P. P.—A dull white powder, tasteless and odourless; the powder feels gritty under the teeth, in consequence of its being in general rather coarsely powdered. The empirical preparation "James's powder," as a succedaneum, for which this preparation was originally introduced into the pharmacopœias, resembles it both in physical and chemical properties, except in being in a state of much more minute division.

C. P.—According to the recent and accurate experiments of Dr. Douglas Maclagan, of Edinburgh, the composition of both preparations appears to be similar, but the proportions of the different ingredients present vary remarkably in different specimens. They consist of from ½ to 2½ per cent. of antimonite of lime, and from 4 to 10 per cent. of sesquioxyde of antimony, to the presence of both of which, chiefly the latter, the activity of the preparation is due; the remainder being inert antimonious acid and phosphate of lime. Boiling water dissolves the antimonite of lime, which is deposited as the solution cools; muriatic acid dissolves the sesquioxyde of antimony and the phosphate of lime.

Prep.—The process for preparing James's powder is a secret with the proprietors of the nostrum; that for antimonial powder is nearly similar in the three British Pharmacopœias, and is as follows: "Sulphuret of antimony, in powder, one part; horn-shavings, two parts; mix and throw them into a wide iron pot (into a crucible, L.) heated to redness, and stir constantly till vapours cease to arise, and the mixture shall have become ash-coloured; rub to powder, and expose for two hours to a heat gradually increased to whiteness, in a crucible covered with another crucible, having a perforated bottom (in a proper crucible, L.); when cool, reduce to a most subtile powder."

Not liable to adulteration; but, as before remarked, it varies much in activity, the empirical preparation being more uniform in character, and, consequently, more generally preferred, notwithstanding its high price.

Th. E.—Antimonial powder and James's powder, though frequently, even in very large doses, not producing the least apparent effect on the system, more generally operate as powerful diaphoretics, causing copious sweating without much excitement or disturb-

ance of the circulation. They are generally employed in the early stages of febrile diseases and in inflammatory affections; they have also been given in chronic skin diseases, and, combined with calomel and opium, in acute rheumatism. In consequence of the uncertainty of their operation, and the very high price at which the patent nostrum is sold, most practitioners at present prefer employing tartar emetic, from which, when administered with proper regulation of the doses, we can obtain similar effects with much greater certainty.

D. & M. OF ADM.—In powder, from gr. iij. to gr. x., repeated every four or five hours; or it may be made into pill with conserve of roses or any of the vegetable extracts.—*Diaphoretic pill.* (Antimonial or James's powder, gr. ij.; extract of conium or of aconite, gr. i.; to be made into one pill.) It should be repeated every six hours.

ANTIMONII SULPHURETUM, D. E. ANTIMONII SESQUISULPHURETUM, L. *Sulphuret of Antimony.*

P. P.—In conical masses or loaves, of a bluish-gray colour, staining the fingers or paper black, with a brilliant, metallic, crystalline fracture; it is inodorous and tasteless, is easily pulverized, and yields a black powder. Sp. gr., 4·6.

C. P.—It is composed of 1 eq. of antimony, and 3 of sulphur ($Sb\,S^3$), Graham. It is permanent in the air; exposed to a moderate heat, it fuses, and at a red heat it volatilizes. It is insoluble in water; with the aid of heat it is completely dissolved by muriatic acid, with the disengagement of sulphuretted hydrogen gas.

PREP.—An article of the Materia Medica in the three British Pharmacopœias; prepared by fusing the ore in a perforated crucible placed over another destined to receive the melted mass; the Dublin College direct it to be farther purified by the process of levigation and elutriation as for prepared chalk (*Antimonii sulphuretum præparatum.*)

Adulterations.—Although not liable to adulteration, as met with in commerce it contains many impurities; most of these are detected by dissolving in muriatic acid; but there is one of much importance which this test will not detect, and which is seldom wanting, namely, arsenic: its presence may be shown by the reduction test as before described for arsenic, the sulphuret being previously mixed with charcoal and carbonate of soda.

TH. E.—This preparation is at present not used in medicine; it was formerly administered as a diaphoretic, in doses of from gr. x. to ʒij., in cutaneous and scrofulous diseases, and in gout and rheumatism. It is employed in pharmacy for preparing the other antimonial compounds.

ANTIMONII SULPHURETUM AUREUM, E. SULPHUR ANTIMONIATUM FUSCUM, D. ANTIMONII OXYSULPHURETUM. *Golden sulphuret of Antimony; Oxysulphuret of Antimony.*

P. P.—A light powder of a bright orange colour, odourless and tasteless when pure.

C. P.—Its chemical composition has not been accurately ascertained; in the Edinburgh Pharmacopœia it is stated to be a mixture or compound of sesquisulphuret of antimony, sesquioxyde of antimony, and sulphur. It is permanent in the air; heated in close vessels, sulphur is sublimed; but if heated in contact with air, it burns with a greenish-blue flame, evolving sulphurous acid, and leaving a grayish residuum. It is insoluble in water, and only partially soluble in dilute acids; with the aid of heat it is nearly all dissolved by solutions of the alkalies.

Prep.—*Dub.* "Prepared sulphuret of antimony, 1 part; water of caustic potash, 18 parts; dilute sulphuric acid, 11 parts, or a sufficiency; add the sulphuret to the caustic potash, and boil for an hour; filter the warm liquor through doubled linen, and drop into it the dilute sulphuric acid; wash away the sulphate of potash with warm water; dry the golden sulphuret, and reduce to a fine powder." *Lond.* "Sesquisulphuret of antimony, powdered, ʒvij.; solution of potash, Oiv.; distilled water, cong. ij.; dilute sulphuric acid, a sufficiency; the steps of the process are the same." *Edin.* "Sulphuret of antimony, in fine powder, ʒi.; solution of potash, fʒxj.; water, Oij.; dilute sulphuric acid, a sufficiency; the same process is followed."

Adulterations.—This preparation often contains oxyde of iron and sulphur, and is frequently coloured with Brazil wood or red saunders wood; all these impurities are readily detected by the tests of the Edinburgh College: "twelve times its weight of pure muriatic acid, aided by heat, dissolves most of it, forming a colourless solution, and leaving a little sulphur."

Th. E.—The golden sulphuret of antimony possesses diaphoretic properties, in large doses producing nausea and vomiting; it is seldom employed alone, but, in the following preparation, is in very general use as a diaphoretic and alterative: *Pilulæ Calomelanos comp.*, D. E. (Calomel and golden sulphuret of antimony, of each, one part; guaiacum resin, in fine powder, two parts; make into a pill mass with a sufficiency (two parts, E.) of treacle; "to be divided into six-grain pills," E.)—*Pil. Hydrargyri Chloridi comp.*, L. (Chloride of mercury, oxysulphuret of antimony, of each, ʒij.; guaiacum resin, powdered, ʒss.; treacle, ʒij.; rub the chloride of mercury with the oxysulphuret of antimony, afterward with the guaiacum resin and the treacle, until incorporated.) This compound is commonly known as *Plummer's Pill;* it is an excellent diaphoretic and alterative, well adapted for cutaneous eruptions, especially those of a syphilitic origin. Dose, gr. v. to gr. x. or gr. xv.

Antimonii et potassæ tartras *sive* tartarum emeticum, D. Antimonii potassio-tartras, L. Antimonium tartarizatum, E. *Tartrate of antimony and potash; Tartar emetic.*

P. P.—Tartar emetic is met with in the shops either in the form of a white powder, or in transparent, colourless crystals, which are octahedrons with a rhombic base. It is inodorous, but has a styptic, nauseous taste.

C. P.—It is composed of one eq. of tartrate of potash, one eq. of tartrate of antimony, and two eq. of water ($KO, Sb O^3 (C^{18}H^4O^{19})$ 2 HO). The crystals effloresce in the air, soon becoming white and opaque, and losing their water of crystallization. Strongly

heated, the salt is decomposed, and an alloy of antimony and potash is obtained. It is soluble in 14 times its weight of cold water, and in less than twice its weight of boiling water; it is insoluble in alcohol. The solution gives *white* precipitates with oxalic and sulphuric acids, caustic potash, and lime-water; *straw-coloured*, with infusion of nutgalls; and *bright orange red*, with sulphuretted hydrogen or the soluble hydrosulphates; the latter is the most characteristic test.

Prep.—*Dub., Edin.* "Nitro-muriatic oxyde (oxyde, E.) of antimony, 4 parts (℥iij., E.); bitartrate of potash, in fine powder, 5 parts (℥iv¼, E.); distilled water, 34 parts (f℥xxvij., E.); mix the powders, and add them by degrees to the water (boiling, D.); boil for half an hour (an hour, E.); filter and crystallize by slow cooling. (More crystals may be obtained from the mother-liquor by a second crystallization, E.)" *Lond.* "Sesquisulphuret of antimony, in powder; nitrate of potash, powdered, of each, ℔ij.; bitartrate of potash, powdered, ℥xiv.; hydrochloric acid, f℥iv.; distilled water, cong. j.; mix accurately the sesquisulphuret of antimony with the nitrate of potash; the hydrochloric acid being then added, and the powder spread upon an iron plate, ignite it; rub the residue to very fine powder when it is cold, and wash it frequently with boiling water until it is free from taste; mix the powder thus prepared with the bitartrate of potash, and boil for half an hour in the distilled water; strain the liquor while hot, and set it aside, that crystals may be formed; these being removed and dried, let the liquor again evaporate, that it may yield crystals."

[U. S. P.—Sulphuret of antimony, in fine powder, 4 oz.; muriatic acid, 25 oz.; nitric acid, 2 drachms; water, a gallon.

Mix the acids together in a glass vessel, add by degrees the sulph. ant., and digest the mixture with a gradually-increasing heat till effervescence ceases, then boil for an hour. Filter the liquor when it has become cold, and pour it into the water. Wash the precipitated powder frequently with water till it is entirely freed from acid, and then dry it.

Take of this powder, 2 oz.; bitartrate of potash, in very fine powder, 2½ oz.; distilled water, 18 fluid ounces. Boil the water in a glass vessel; then add the powders previously mixed together, and boil for an hour; lastly, filter the liquor while hot, and set it aside to crystallize. By farther evaporation, the liquor may be made to yield an additional quantity of crystals, which should be purified by a second crystallization.]

Adulterations.—In the crystalline state, this salt is seldom adulterated; in a few instances I have found crystals of sulphate of potash mixed with those of tartar emetic, evidently an intentional fraud, but one easy of detection, as crystals of tartar emetic, when dropped into a solution of sulphuretted hydrogen, have an orange-coloured deposite formed on them. The powder is very commonly adulterated with cream of tartar, and, from being badly prepared, frequently contains a large quantity of the oxyde of iron; both impurities are readily detected by the tests of the Edinburgh Pharmacopœia: "Entirely soluble in 20 parts of water; solution colourless, and not affected by solution of ferrocyanide of potassium; a solution in 40 parts of water is not affected by its own volume of a solution of 8 parts of acetate of lead in 32 parts of water, and 15 parts of acetic acid."

Th. E.—In properly-regulated doses, tartar emetic produces diaphoresis more uniformly and more certainly than any other of the antimonial preparations; nausea sometimes accompanies its diaphoretic action, but this is attended with the advantage of placing the system in a condition in which sweating is more freely produced. In all the varieties of febrile diseases, especially when

a determination of blood to the head forbids the use of the more stimulating diaphoretics, tartar emetic is employed with great benefit. It has also been used with much advantage in obstinate cutaneous diseases, administered in decoction of sarsaparilla, or in decoction of elm bark, if much debility be present. The employment of the antimonial preparations generally is contra-indicated in diseases where gastric irritation is present. (See *Emetics and Sedatives.*)

D. & M. of Adm.—$\frac{1}{12}$ to $\frac{1}{6}$ of a grain, frequently repeated; it is seldom given in substance, and is best administered dissolved in a large quantity of distilled water without any flavouring adjunct; thus, gr. ij. may be dissolved in Oj. of water, and f℥i. of this taken every hour until sweating is produced. The following is used as a substitute for James's powder: Tartar emetic, gr. i.; sulphate of potash, in fine powder, gr. xx.; mix. Dose, gr. ij to gr. iij., every hour.—*Liquor Tartari Emetici*, D. *Vinum Antimonii Potassio-tartratis*, L. *Vinum Antimoniale*, E. "Tartar emetic, ℈i.; boiling distilled water, *by measure*, ℥viij.; rectified spirit of wine, *by measure*, ℥ij.; dissolve in the water, filter, and add the spirit," D. ("Dissolve gr. xl. of tartar emetic in Oj. of sherry," L. E.) Every fluid ounce contains gr. ij. of tartar emetic. Dose, as a diaphoretic, min. xx. to min. xxx., every hour.

Incomp.—The acids; the alkalies, and their carbonates; lime-water; chloride of calcium; the earths; some of the metallic oxydes; hydrosulphurets; the acetates of lead; corrosive sublimate; decoctions and infusions of most of the bitter and astringent vegetables, as those of cinchona, rhubarb, galls, catechu, &c. The solution in water spoils by keeping.

Arctium lappa, semina, radix, D. *Common Burdock; The seeds and root of Arctium lappa.*—This is an indigenous plant, growing commonly in waste places and by roadsides. It belongs to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Æqualis.*

This plant, though still retained in the Dublin Pharmacopœia, in the present day is never employed in regular practice. A decoction of the root is a popular diet drink in chronic cutaneous diseases and in rheumatism. It produces gentle diaphoresis, and also increases the flow of urine. Guibourt has found *Inulin* in the root of burdock.

Dulcamara, D. L. E. *The stems (twigs, E.) of Solanum dulcamara; Woody nightshade; Bitter-sweet.*—Indigenous, growing in hedges and thickets. It belongs to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Stems shrubby, twining and branching; leaves cordate, upper ones hastate; flowers elegant, purple, in drooping clusters; anthers large, yellow, united into a pyramidal or cone-shaped figure; berries scarlet, juicy.

P. U. & M. of Prep.—The stems or twigs; they are gathered in autumn when the leaves have fallen off, and dried with the heat of a stove. Those stems of the thickness of a goose-quill are usually selected.

P. P.—The twigs, as met with in the shops, are dark-brown externally, white within, light and spongy in the centre; when fresh they have a faintly nauseous odour, which is lost by drying; the taste is at first bitter, afterward sweetish, whence the name bitter-sweet is applied to the plant.

C. P.—According to the analysis of Desfosses, dulcamara contains, besides some salts of lime and potash, and other unimportant substances, a peculiar alkaline principle, insoluble in water, soluble in alcohol and ether, pulverulent, inodorous, white, permanent in the air, which he has called *Solania*, the medical properties of which have not been yet fully examined. Bitter-sweet yields its active properties to both water and alcohol.

Th. E.—A decoction has been employed as a diaphoretic in rheumatic and venereal affections, and in chronic diseases of the skin. Its medical properties are, however, very feeble, and in the present day it is scarcely ever employed.

D. & M. of Adm.—*Decoctum Dulcamaræ*, D. L. E. (Dulcamara twigs, chopped, ʒi.; water, fʒxxiv.; boil down to fʒxvj., and strain.) Dose, fʒi. to fʒij., two or three times a day.

Guaiaci lignum, D. L. E. *Wood of Guaiacum officinale.*

Guaiaci resina, D. L. Guaiacum, E. *Resin (obtained by heat from the wood, E.) of Guaiacum officinale.*—This tree is a native of Jamaica, of St. Domingo, and of many other West India islands; it belongs to the natural family *Zygophyllaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A tree attaining a height of 30 or 40 feet, with a crooked stem, and a hard, heavy wood; leaves evergreen, bijugate; flowers pale blue, in clusters in the axillæ of the upper leaves; fruit yellow, obovate, coriaceous.

P. U. & M. of Prep.—The wood, which is divided into logs or billets; and the resin, which is obtained as a spontaneous exudation from cracks or fissures in the stem, or by incisions made into it; or artificially procured, by heating one end of billets of the wood which have been previously bored lengthwise, until the resin flows out of the opposite extremity; or by boiling the chips and raspings of the wood in a strong solution of common salt, when the resin swims on the surface of the liquid.

P. P.—Guaiacum wood, commonly termed Lignum-vitæ, is imported in logs or billets about nine inches in diameter, and of various lengths; it is extremely hard, consisting of an outer circle of young wood (*alburnum*) of a pale-yellow colour, and a centre of old wood (*duramen* or *heart-wood*) of a dark-green colour; its density is 1·333, so that it sinks when thrown into water. For medical uses, the wood is rasped or shaved into coarse powder (*scobs vel rasura guaiaci*); they have an acrid, resinous taste, and a peculiar, aromatic odour. Guaiacum resin is a semi-transparent solid, breaking with a vitreous fracture; the fractured surface varies much in colour, being partly brownish, partly reddish, and partly greenish, but it always becomes green when exposed to the light and air. The odour and taste are similar to, but stronger than those of the wood. The sp. gr. is 1·29.

C. P.—Guaiacum wood consists of a peculiar acrid principle, and

its proper resin, besides gummy matter, mucous extractive, lignin, &c. Its active properties are probably due to the acrid matter as well as to the resin. The latter, the physical properties of which have been described above, is insoluble in water and in the fixed oils, but is soluble in alcohol and in solutions of the alkalies. The alcoholic solution is precipitated by water and by muriatic acid, but not by acetic acid; nitric acid occasions no change at first, but after some hours the liquid becomes green, then blue, and at last a brown precipitate falls down; dropped on flour or on a transverse slice of a potato, a blue colour is produced on exposure to the air. Guaiacum resin is fused by heat.

Adulterations.—Various resinous substances are frequently mixed with, or substituted for, guaiacum; these may readily be detected by applying the tests of the Edinburgh Pharmacopœia for the true resin: "Fresh fracture red, slowly passing to green. The tincture slowly strikes a lively blue colour on the inner surface of a thin paring of a raw potato." The shavings may be readily distinguished from those of any other wood by the action of nitric acid, which communicates to them a temporary bluish-green colour.

Th. E.—Guaiacum wood and its resin are stimulating diaphoretics, and are, consequently, inadmissible in all states of excitement or acute inflammation of the system. They are well adapted for chronic rheumatism of the old or debilitated; for the atonic stages of gout; for chronic diseases of the skin, especially those of a syphilitic origin, or occurring in scrofulous habits; and for all the forms of secondary syphilis, provided there is no irritation or inflammatory tendency in the alimentary canal. When first introduced into the practice of medicine, they were believed to possess antivenereal virtues, little, if at all, inferior to mercury.

D. & M. of Adm.—The resin may be given in powder, in doses of from gr. x. to 3ss.; it may be administered in the form of bolus made with treacle or conserve of roses, or suspended in water by means of mucilage. The wood is not administered in powder.—*Decoctum Guaiaci*, E.—*compositum*, D. (Guaiac turnings, ʒiij.; sassafras root, cut (rasped, E.), 3x. (ʒj., E.); liquorice root, bruised, ʒiiss. (ʒj., E.); (raisins, ʒij., E.); water, *by measure*, ℔x. (Oviij., E.); boil the guaiac (and raisins, E.) in the water down to one half (Ov., E.), adding the liquorice and sassafras towards the close, and strain.) The old *decoction of the woods*, a sudorific, in doses of fʒiv., two or three times a day.—*Aqua Calcis comp.*, D. (Guaiac shavings, ℔ss.; liquorice root, cut and bruised, ʒj.; sassafras bark, bruised, ʒss.; coriander seeds, 3iij.; lime-water, *by measure*, ℔x.; macerate without heat for two days in a close vessel, frequently shaking, then strain.) Seldom used at present. Dose, fʒij. to fʒiv. —*Mistura Guaiaci*, L. E. (Guaiacum resin, ʒiij.; sugar, ʒss.; mucilage, fʒss.; cinnamon-water, fʒxix.; rub the guiac with the sugar and mucilage, adding gradually the cinnamon-water.) Dose, fʒss. to fʒij., two or three times a day.—*Tinctura Guaiaci*, D. L. E. (Guaiacum resin (bruised, L.; in coarse powder, E.), ʒiv. (ʒvij., L. E.); rectified spirit, *by measure*, ℔ij. (Oij., L. E.); macerate

for 7 (14, L.) days, and filter.) Dose, f℥i. to f℥ss.; it is decomposed by water; it should, therefore, be suspended in aqueous vehicles by means of sugar or mucilage.—*Tinctura Guaiaci ammoniata*, D. E. *Tinct. Guaiaci comp.*, L. (Guaiacum resin (bruised, L.; in coarse powder, E.), ℥iv. (℥vij., L. E.); aromatic spirit of ammonia (spirit of ammonia, E.), ℔iss. (Oij., L. E.); macerate for 7 (14, L.) days, and filter.) The best of its officinal preparations. Dose, f℥j. to f℥ij., exhibited as the preceding.—*Sirupus Guaiaci*, AUGUSTIN. (Ammoniated tincture of guaiacum, f℥ij.; mucilage and sirup of almonds, of each, f℥i.; mix.) An elegant formula. Dose, f℥i. to f℥ij.

IPECACUANHÆ PULVIS COMPOSITUS, D. L. E. *Compound powder of Ipecacuanha; Dover's powder.*

P. P.—A brownish-yellow powder, with an opiate odour, and a bitter, saline, slightly acrid taste.

C. P.—It is composed of one part each of powdered ipecacuanha and opium, and eight parts of powdered sulphate of potash. It is insoluble in water or in alcohol.

PREP.—"Ipecacuanha, in powder; and opium (Turkey, D.; hard, L.), in powder, of each, ℥i. (℥i., E.); sulphate of potash, ℥i. (℥viij., E.); mix (first the sulphate of potash with the opium, then the ipecacuanha, D.) intimately."

TH. E.—One of the most powerful and most generally employed sudorifics, possessing properties which do not belong to any of its ingredients separately. Its employment is contra-indicated in cases attended with irritability of the digestive organs, or where there is cerebral disturbance. It is especially adapted for the milder forms of catarrh, coryza, acute rheumatism, and general dropsy accompanied with suppressed or diminished perspiration, particularly when the urine is albuminous.

D. & M. OF ADM.—Gr. v. to gr. xx., in pill or in bolus made with conserve of roses. The surface of the body should be kept warm, and the patient not permitted to drink for some time after taking the medicine, as a precaution against vomiting. Every ten grains of Dover's powder contain one grain each of opium and ipecacuanha.—*Pilulæ Ipecacuanhæ et Opii*, E. (Compound ipecacuanha powder, ℥iij.; conserve of red roses, ℥i.; divide into gr. iv. pills.) Dose, gr. iv. to gr. viij.

MEZEREON, D. E. MEZEREUM, L. *Bark* (*of the root*, L. E.) *of Daphne Mezereum; Mezereon.*—An indigenous shrub, belonging to the natural family *Thymelaceæ*, and to the Linnæan class and order *Octandria Monogynia.*

B. C.—Stem woody, branching, covered with a smooth greenish-gray cuticle; leaves scattered, smooth, lanceolate; flowers pale-rose colour, highly fragrant, appearing before the leaves, in little tufts on the naked branches; berries scarlet.

P. U. & M. OF PREP.—Although the London and Edinburgh Colleges direct the bark of the root to be employed, as met with in the shops it appears to have been removed as well from the branches. The Dublin druggists and apothecaries generally employ the whole root. The bark is collected in spring, being then most active, and dried with stove heat.

P. P.—The root is generally entire, of various lengths, sometimes branching; externally it is covered with the bark, which is

of a brown colour, smooth, wrinkled; in the centre is the white, hard, tasteless wood; between it and the outer bark the inner bark is white and cottony; the thickness of the root varies from that of a quill to that of the little finger. The bark (*cortex mezerei*) is in pieces of various lengths, quilled, tough, and pliable; it is covered with the olive-brown, tasteless epidermis; the true bark is of a greenish-white colour, and fibrous. It has a slight nauseous odour; the taste is at first faint, but leaves a hot, acrid impression upon the tongue and fauces; in the fresh state, the bark has a very acrid taste.

C. P.—The inner bark of the mezereon contains a neutral crystalline principle, which has been named *daphnin*, and an acrid resin, in combination with wax, sugar, colouring matter, woody fibre, &c. It yields its active principles to water and to alcohol.

Adulterations.—Various similar barks and roots are either mixed with, or substituted for, mezereon; they may be distinguished by not having the same acrid taste. The woody part, which constitutes the great portion of the root, is perfectly inert, and, consequently, should not be employed.

Th. E.—Mezereon is a stimulating diaphoretic, but its properties as such are very feeble in comparison to its acridity, in consequence of which it is not much employed at present. It was formerly in high repute as an efficacious remedy for venereal nodes, and in other forms of secondary syphilis.

D. & M. of Adm.—In decoction, in doses of f℥iv. or f℥v., three or four times a day.—*Decoctum Mezerei*, D. (Mezereon bark, ʒij; liquorice root, bruised, ℥ss.; water, ℔iij.; boil down to ℔ij., and strain.) It also enters into the composition of the compound decoction of sarsaparilla.

Sarza, L. E. Sarsaparilla, D. *Root of Smilax sarsaparilla*, D.—*of Smilax officinalis*, L.—*and probably also of other species*, E. *Sarsaparilla.*—The various species of the genus sarsaparilla, from which the medicinal root is obtained, are inhabitants of the warmest regions of South America, especially Peru and Mexico. They are placed in the natural family *Smilaceæ*, and in the Linnæan class and order *Diœcia Hexandria.*

B. C.—Diœcious creepers; perianth six-parted; male flowers, with six stamens; female, with a three-celled ovary, each cell one-seeded; berry three-celled, containing one to three roundish seeds.

P. U. & M. of Prep.—The roots; they are dug up the whole year round, and dried in the sun.

P. P.—Several varieties of sarsaparilla are met with in English commerce; the most important of these are, Jamaica, Honduras, Brazil, and Lima Sarsaparilla. They are met with in bundles formed of the folded roots; in the Brazilian variety, the roots are unfolded; the bundles are generally from twenty inches to three feet in length; the roots consist of a rhizome, *the chump* of druggists (which, however, is frequently absent), and of numerous rootlets several feet in length, about the thickness of a writing pen, cylindrical, flexible, wrinkled longitudinally, with more or less root-

fibres attached to them; of a reddish-yellow or brown colour externally, the inner bark being rose-coloured and more or less mealy, and the centre (*meditullium*) woody, whitish, and shining. Sarsaparilla has scarcely any odour; the taste is mucilaginous, slightly nauseous, leaving an acrid sensation on the back part of the tongue and fauces. *Jamaica Sarsaparilla* has a lively red tint, and more attached root-fibres than the other sorts, whence it is sometimes called *red-bearded sarsaparilla;* it is the most esteemed. *Honduras Sarsaparilla* is of a grayish-brown colour, and has but few rootlets attached; the inner bark is so amylaceous, that when the root is rubbed or broken, a white mealy powder is driven out of it; this is the sort generally used in the shops for cutting into chips. *Brazilian Sarsaparilla* resembles the last in colour and mealiness, but is almost free from rootlets, and the *chump* is not attached. *Lima Sarsaparilla* resembles in appearance Jamaica, for which it is often sold; its colour, however, is grayish-brown, and the *chump* is invariably attached, being folded into the centre of the bundle.

C. P.—Various analyses have been made of sarsaparilla; it appears to consist of volatile oil, nearly all of which is lost by drying, of a peculiar white, crystallizable principle, which has been named *smilacin* (*paraglin*, *salseparine*, *parallinic acid*, of various chemists), acrid, bitter resin, lignin, starch, and mucilage. It yields its active properties to boiling water by simple maceration; and the continued boiling to which it is submitted, by the directions of the colleges, for preparing the decoctions, the sirup, and the extracts, is not only perfectly useless, but highly injurious, and to this fact we may ascribe the great discrepancy of opinion which exists as to the medicinal properties of the drug.

Adulterations.—The roots of various allied species which do not possess any medicinal property whatsoever, are mixed in America with the true sarsaparillas; and in this country the inferior sorts are sold for the finer qualities. The former fraud may be detected by the taste, which is the surest criterion; the latter, by attending to the characters of the different species as given above.

Th. E.—Nothwithstanding the little esteem that sarsaparilla is held in by many practitioners, a medicine possessing the great activity that it does in the recent state, as described by Dr. Hancock, can scarcely be inert; unless, as before observed, we destroy its medicinal properties by the pharmaceutical processes to which it is submitted. Under its use, undoubtedly, diaphoresis is frequently produced, and secondary syphilitic affections, especially nocturnal pains, ulcerations of the throat, and cutaneous eruptions have been speedily cured; these effects, however, have been ascribed by many, and I must say with much reason, to the restricted diet to which patients are submitted while undergoing what is called an alterative course. The question of the powers of sarsaparilla in secondary syphilis is worthy of still farther investigation, particularly if we consider the high price of the drug, and the great expenditure which its use in hospitals and public charities entails on these institutions; and in any future trials, it would be well to use

a simple infusion prepared with boiling water, in the same manner and of the same strength as the compound infusion of the Dublin Pharmacopœia, substituting boiling distilled water for the lime-water ordered in that formula.

D. & M. OF ADM.—In powder, the dose is from ʒj. to ʒij.; it is very seldom administered in this form; but if the powder be good, as may be ascertained by the taste, it ought to prove the best mode of giving the medicine; it may be made into a bolus with honey.—*Infusum Sarsaparillæ comp.*, D. (Sarsaparilla root, previously cleansed with cold water and sliced, ℥i.; lime-water, *by measure*, ℔j.; macerate for 12 hours in a close vessel, shaking it occasionally, and strain.) Although lime-water is here ordered, it is not so good a solvent for the constituents of sarsaparilla as distilled water. Dose, f℥iv. to f℥vj.. two or three times a day.—*Decoctum Sarsaparillæ*, D. *Decoctum Sarzæ*, L. E. (Sarsaparilla, sliced (and cleaned with cold water, D.), ℥iv. (℥v., L. E.); boiling (distilled, L.) water, ℔iv. (Oiv., L. E.); macerate with a medium heat (near the fire, L.) for 4 (2, E.) hours in a vessel lightly covered; take out the root, bruise and replace it (macerate for two hours farther, L.); boil down to ℔ij. *by measure* (Oij., L. E.), and strain.) Dose, f℥iv. to f℥viij., three or four times a day.—*Decoctum Sarsaparillæ* (*Sarzæ*, L. E.) *comp.*, D. L. E. (Decoction of sarsaparilla, boiling, *by measure*, ℔iv. (Oiv., L. E.); sassafras chips, guaiac turnings, bruised liquorice root, of each, ℥i. (ʒx., L. E.); mezereon root bark, ʒiij. (ʒiv., E.); boil for a quarter of an hour, and strain.) The old *decoction of sweet-woods*. Dose, f℥iv. to f℥vj., three or four times a day.—*Extractum Sarsaparillæ*, D. *Extractum Sarzæ*, L. (Sarsaparilla, sliced, ℔j. (℔iiss., L.); boiling (distilled, L.) water, cong. j. (cong. ij., L.); macerate for 24 hours, then boil down to ℔iv. (cong. j., L.), and strain the liquor while yet hot; lastly, evaporate to a proper consistence.) Dose, ʒss. to ʒij.—*Extractum Sarsaparillæ fluidum*, D. (Sarsaparilla, sliced, ℔j.; water, *by measure*, ℔xij.; boil together for an hour, and pour off the liquor; then add ℔ij., *by measure*, of water, repeat the boiling and pouring off; express strongly the liquor from the residue, set aside the mixed liquors, that the fæces may subside; then evaporate the mixture by continual boiling down to ℥xxx., and add ℥ij. of rectified spirit.)—*Ext. Sarzæ fluidum*, E. (Sarsaparilla chips, ℔j.; boiling water, Ovj.; digest the root for two hours in 4 pints of the water, take it out, bruise and replace it, and boil for two hours; filter and squeeze out the liquor; boil the residue in the remaining 2 pints of water, and filter, and squeeze out this liquor also; evaporate the united liquors to the consistence of sirup; add, when the product is cool, as much rectified spirit as will make in all f℥xvj. This fluid extract may be aromatized with volatile oils or warm aromatics.) Notwithstanding the introduction of the above formula into the last edition of the Edinburgh Pharmacopœia, it is a very generally received opinion that the extracts are perfectly inert; by those who prescribe them, they are used as adjuncts to the decoctions. Dose, f℥ss. to f℥j.—*Sirupus Sarsaparillæ*, D. *Sirupus Sarzæ*, L.

E. (Sarsaparilla, sliced, ℔j. (℥xv., L. E.); boiling water, cong. j.; macerate the sarsaparilla in the water for 24 hours; then boil down to ℔iv. (Oiv., L. E.), and strain the liquor while hot; and add sugar (℥xv., L.), so as to make a sirup.) Dose, f℥iv. to f℥vi., diluted with water, or as an adjunct to the decoction.

[U. S. P.—*Sirupus Sarsaparillæ compositus.* Take of sarsaparilla, bruised, 2 lbs.; guaiacum wood, rasped, 3 oz.; hundred-leaved roses, senna, liquorice root, each, in coarse powder, 2 oz.; oil of sassafras, oil of anise, each, 5 minims; oil of partridge berry, 3 minims; diluted alcohol, 10 pints; sugar, 8 lbs.

Macerate the sarsaparilla, guaiacum wood, roses, senna, and liquorice root in the diluted alcohol for 14 days; then express and filter. Evaporate the tincture by the water-bath to 4 pints, filter, and add the sugar, and this being dissolved with the aid of heat, remove any scum which may form, and strain while hot. Lastly, having rubbed the oils with a small quantity of the sirup, mix them thoroughly with the remainder.

Another method of preparing the compound sirup of sarsaparilla is by substituting *water*, q. s., for the alcohol, the other ingredients being used in the same proportions, thus: mix the sarsaparilla, guaiacum wood, roses, senna, and liquorice root with 3 pints of water, and let it stand twenty-four hours; then transfer the whole to an apparatus for displacement, and pour on water gradually until 1 gallon of filtered liquor is obtained. Evaporate this to 4 pints, then add the sugar, and proceed in the manner directed for sirup. Lastly, rub the oils with a small portion of the sirup, and mix them thoroughly with the remainder.

A tablespoonful 3 or 4 times a day, increasing it to a small wine-glassful, is the ordinary dose; and it is much employed in America in secondary syphilis, as well as other analogous constitutional diseases, although its powers are much overrated, being only valuable as an auxiliary to more potent remedies. This article, variously modified, constitutes the basis of all the quack nostrums under the name of Panaceas, Catholicons, Indian and vegetable sirups, &c., by the sale of which as universal remedies the public have been fleeced by the tribe of impostors, who revel in their ill-gotten gains.]

[*Hydro-alcoholic fluid Extract of Sarsaparilla.*—This is an officinal preparation, in which the virtues of the root are so concentrated that one part represents 3 parts of sarsaparilla; and in this form it is much used in the United States. Messrs. Deluc and Dupuy, of New-York, prepare it thus: ℞ Rad. Sarsaparillæ, 60 parts, well bruised. Proof Spirit, 120 parts. By displacement, make a tincture, and then distil it in a water-bath, till there remains behind 20 parts in the still. This portion being filtered, one part of rectified spirit is to be added.

Salsaparine, Fr. Sarsaparilline.—This is the alkaloid of this article, and is prepared by J. Milhau, of New-York, thus: To a concentrated tincture of the root add a solution of the acetate of lead, so long as a precipitate takes place. Should there then be an ex-

cess of lead, add a few drops of sulphuric acid, then filter and distil. It crystallizes in radiated groups. When dry, it is slightly pungent; in solution, acrid, and somewhat bitter. It is to the presence of this article that the various preparations of sarsaparilla owe their remarkable property of frothing, and there can be little doubt but it is the most active constituent of this remedy. See the *French Universal Pharmacopœia*, and *Soubein's Mat. Med.*]

Sassafras, D. L. E. *The root* (*wood and volatile oil*, D.) *of Laurus sassafras*, D. L.; *of Sassafras officinale*, E. *Sassafras.*—The same tree is indicated by all the colleges, but the Edinburgh has adopted the nomenclature of Nees von Esenbeck. It is a native of North America, and belongs to the natural family *Laurineæ*, and to the Linnæan class and order *Enneandria Monogynia.*

B. C.—A tall, straight tree, with alternate, caducous leaves, of a lucid-green colour; flowers diœcious, yellow, appearing before the leaves; berry succulent, of a rich blue colour.

P. U. & M. of Prep.—The root, and the volatile oil which is obtained from it by distillation.

P. P.—Sassafras root is imported in various-sized, branched pieces or logs, covered with a reddish-brown bark, which is often partially stripped off; the wood is of a reddish-yellow colour, light, and very porous; it has an aromatic, agreeable odour, somewhat resembling fennel, and a warm, aromatic taste. The odour and taste of the bark are stronger than of the wood. The volatile oil is of a pale-yellow colour, has an analogous odour and taste, and is heavier than water.

C. P.—Sassafras root has not been analyzed; its active properties depend on the volatile oil, of which the wood contains about two per cent. The medicinal virtues are extracted both by water and alcohol.

Th. E.—A stimulating diaphoretic, but its powers as such are so uncertain that it is never prescribed alone. The wood forms a constituent of the *compound decoction of sarsaparilla*, and of the *compound decoction of guaiacum;* but the continued boiling to which those preparations are submitted must completely dissipate the volatile oil, the active principle of the sassafras.

D. & M. of Adm.—It may be given in the form of infusion, prepared by infusing ʒi. of the chips in Oi. of boiling water for an hour, of which fʒij. may be taken three or four times a day.—*Oleum Sassafras*, D. E. But seldom used; it is an aromatic stimulant, in doses of min. ij. to min. x.

CHAPTER VIII.

DIURETICS.

Diuretics are medicines which augment the secretion and promote the discharge of urine. These effects are produced in a very different manner by different substances; some acting as direct stimulants to the secreting vessels of the kidney, being taken into the current of the circulation, and carried, without undergoing any decomposition, *in transitu* to the urinary organs; others are partially acted on by the digestive organs, and some of their component parts thus eliminated are carried by the circulation to the kidneys, which are thereby stimulated to increased action; while a third class of substances acts primarily on the stomach, the action they excite being secondarily communicated by sympathy to the urinary organs. In whatever manner the action of diuretics is produced, their general effect is to diminish the watery part of the blood, and by this means promote the absorption of fluid effused into any of the cavities or into the cellular membrane. Hence, dropsy is the disease in which they are principally employed, and when the discharge of urine can be excited by their administration, the effused fluid is in general removed more speedily from the system, and with less injury to the patient than by any other method. But they are most uncertain in their operation, and it often happens that, although the discharge of urine is much augmented, the dropsical swellings are not removed. The action of diuretics is much modified by the state of the skin, and therefore it frequently occurs that if the surface of the body be excited by external warmth after the administration of a diuretic, its action will be diverted from the kidneys to the vessels of the skin, and diaphoresis will be occasioned. A cathartic action seems also to be incompatible with diuresis, and, consequently, some remedies, as cream of tartar, oil of turpentine, &c., which, if given in small doses properly regulated, increase remarkably the urinary discharge, when administered in larger doses, so as to act on the bowels, will scarcely occasion any apparent influence on the functions of the kidneys. The most important rules to be attended to in the administration of the remedies of this class are to keep the surface of the body cool, and to promote the operation of the substance by the use of diluent drinks.

[Much obscurity rests upon this whole subject, and, indeed, from the researches of Woehler, Müller, and others, it is proved that some of the articles enumerated under this class possess no diuretic property, nor any power to act upon the secretion of the kidneys. This is shown with reference to digitalis especially, the supposed diuretic properties of which in dropsy are ascribable to its influence in correcting the morbid state of the animal functions upon which

dropsy depends, the ordinary office of the kidneys being afterward called into requisition under the laws of vitality to an extent adequate to the removal of the disease. So, also, quinine in the same way often cures the dropsy, which is among the sequela of intermittent fever, by improving the condition of the digestive organs, not by any diuretic power, although the effused fluid passes off by the urine and other emunctories often with great rapidity.

While it must be admitted that catharsis is often incompatible with diuresis, as stated by the author, yet it is equally certain that the hydragogue cathartics often succeed in curing dropsical effusions, especially ascites and hydrothorax, when all the diuretic agents have been employed in vain. It will be found, however, that whenever they produce large fluid discharges from the bowels, the kidneys are simultaneously stimulated to inordinate action; and, indeed, dropsy is seldom cured until all the emunctories of the body are employed in draining off the effused fluid, the skin being opened as well as the urinary and alvine discharges. This explains why it is that diuretics are said to be "most uncertain in their operation, and that the dropsical swellings are not removed, even though the urinary discharge is augmented." They are too often prescribed without reference to the pathological state upon which the dropsy depends.]

Æthereus nitrosus spiritus, D. Spiritus ætheris nitrici, L. E. *Nitrous ethereal spirit; Hyponitrous ether with (four volumes of,* E.) *rectified spirit; Spirit of nitric ether; Sweet spirits of nitre.*

P. P.—A transparent, colourless liquid, with a peculiar fragrant, ethereal odour, and a pungent, sweetish, acidulous taste. The sp. gr., as prepared by the process of the three British Pharmacopœias, varies; that of Dublin being ·850; of London, ·834; and of Edinburgh, ·847.

C. P.—This preparation is a mixture of hyponitrous ether and alcohol in variable proportions. It is very volatile, producing much cold during its evaporation; is very inflammable, and burns with a whitish flame. It mixes with alcohol and water in all proportions. By keeping, it gradually becomes acid.

Prep.—*Dub.* "Add to the residuum of the distillation of nitrous ether the rectified spirit employed in that operation for condensing the elastic vapour, and distil to dryness with a greater heat of a water-bath; mix the distilled liquor with the alkali liquor remaining after the separation of the nitrous ether, mix and add sufficient dry carbonate of potash to saturate the free acid, as indicated by litmus paper; lastly, distil with the medium heat of a water-bath as long as any drops come over." The *Dublin* Pharmacopœia contains also a second process, nearly similar to that of *London*, and which is more usually followed.—*Dub., Lond.* "Add gradually ʒij. (ʒiv., L.) of nitric acid to ℔j. (℔iij., L.) of rectified spirit; mix and (with a gentle heat, D.) distil ʒxij. (fʒxxxij., L.)"—*Edin.* "Rectified spirit, Oij., fʒvj.; pure nitric acid (D., 1500), fʒvij.; put fʒxv. of the spirit with a little clean sand into a two-pint matrass, fitted with a cork, through which are passed a safety tube terminating an inch above the spirit, and another tube leading to a refrigeratory; the safety tube being filled with pure nitric acid, add through it gradually fʒiiiss. of the acid. When the ebullition which slowly arises is nearly over, add the rest of the acid gradually, fʒss. at a time, waiting till the ebullition caused by each portion is nearly over before adding

more, and cooling the refrigeratory with a stream of water, iced in summer. The ether thus distilled over being received into a bottle, it is to be agitated, first with a little milk of lime till it ceases to redden litmus paper, and then with half its volume of a concentrated solution of muriate of lime. The pure hyponitrous ether thus obtained, which should have a density of 899, is then to be mixed with the remainder of the spirit, or exactly four times its volume."

Adulterations.—Spirit of nitric ether often contains free nitrous acid, probably from being too long kept. It is adulterated with water and with alcohol; the tests of the *Edin. Phar.* readily detect those impurities: "Density, ·847 (·850, D.; ·834, L.). It effervesces feebly or not at all with solution of bicarbonate of potash; when agitated with twice its volume of concentrated solution of muriate of lime, twelve per cent. of ether slowly separate."

Th. E.—It operates as a mildly stimulating diuretic, and with such intention is administered in dropsical affections, especially when occurring in children. It is most generally employed as an addition to other remedies of this class, as digitalis, squill, &c., the diuretic operation of which it renders more certain. Spirit of nitric ether sometimes fails to act on the kidneys, when it generally promotes the cuticular secretion, and, consequently, it is frequently employed with benefit in combination with the water of acetate of ammonia in the early stages of febrile diseases. Christison states that, as a diuretic, he has found sweet spirits of nitre "least serviceable in dropsy connected with diseased kidney, and most useful in the form associated with diseased heart."

D. & M. of Adm.—f℥ss. to f℥ij. or ℥iij. every second or third hour; it is best given in water or in camphor mixture.—*Diuretic potion*, Swediaur. (Spirit of nitric ether and vinegar of squills, of each, f℥i.; juniper water, f℥iij.; compound spirit of horse-radish and sirup of ginger, of each, f℥ij.; mix.) Dose, f℥i., two or three times a day.

Bucku, E. Diosma, L. Diosma crenata, folia, D. *Buchu or Bucku; Leaves of various species of Barosma*, E. *Leaves of Diosma crenata*, D. L.—The various species of the genus Diosma, or, as it has been recently named, Barosma, from which the buchu of commerce is obtained, are natives of the Cape of Good Hope; and are placed in the natural family *Rutaceæ*, and in the Linnæan class and order *Pentandria Monogynia*.

B. C.—Small shrubs, with opposite, smooth, dotted leaves, and stalked, axillary flowers.

P. P.—As met with in the shops, buchu consists of the leaves of various species, two in particular: *B. crenata*, and *B. crenulata*, intermixed with broken stalks and seed-vessels. The leaves are smooth and shining, dotted with glands containing essential oil; they are of a pale yellowish-green colour, have a heavy aromatic odour resembling a mixture of rue and peppermint, and an aromatic taste, leaving a sense of coldness on the mouth. One specimen of buchu, which I had an opportunity of examining, consisted entirely of the leaves of *B. serratifolia* unmixed; its odour was much stronger than what is commonly met with, and, from the absence

of any seed-vessels, was probably gathered before the plant flowered.

C. P.—Buchu leaves consist of volatile oil (upon which their medicinal properties chiefly depend), gum, resin, extractive, &c. They yield their virtues to water and to alcohol. The volatile oil is of a yellowish-brown colour, lighter than water, and of the same odour as the leaves; the extractive has been named *Diosmin*.

Th. E.—Buchu is a stimulating diuretic; the volatile oil is taken into the circulation, and it communicates its odour to the urine soon after it has been taken. Independently of its stimulating the kidneys to increased action, it seems to act as a direct tonic to the mucous membrane of the urino-genital organs; thus, it is found most useful in chronic mucous discharges from the bladder and urethra, in diseased prostate, in irritability of the bladder, and in some forms of incontinence of urine. At the Cape of Good Hope, the powdered leaves are used as a vulnerary, and a spirit distilled from them is employed in dyspeptic affections.

D. & M. of Adm.—In powder (a bad form), ℈ j. to ʒss.—*Infusum Buchu*, D.—*Bucku*, E.—*Diosmæ*, L. (Buchu leaves, ℥ss. (℥i., L. E.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oj., L. E.); infuse for four (two, E.) hours, and strain.) Dose, f℥i. to f℥ij.—*Tinctura Buchu*, D. E. (Buchu leaves, ℥ij. (℥v., E.); proof spirit, *by measure*, ℔i. (Oij., E.); macerate for 7 days, and filter. "May be also made quickly and conveniently by percolation," E.) Dose, fʒi. to fʒiij., in any convenient vehicle.

Cambogia.—The diuretic properties of gamboge have been before noticed, and a formula given for its administration with that intention. (See page 91.)

Cantharis, L. E. Cantharis vesicatoria, D. *Cantharis vesicatoria; The whole fly; Cantharides.*—This, the *Meloë vesicatorius* of Linnæus, belongs to the class *Insecta*, and to the order *Coleoptora*. It is a native of the middle and southern parts of Europe, and has also been met with, but rarely, in England. It frequents the ash, the privet, the lilac, and the honeysuckle, and is also found on the elder, the rose, the plum, the elm, and the poplar, upon the leaves of which trees the insect feeds. In the month of June, cantharides are collected in the South of Europe. In the morning before the rising of the sun, while the insects are still torpid from the moisture of the night, men, whose faces and hands are covered with masks and gloves, having spread a cloth upon the ground, shake the trees violently; the insects fall into the cloth, are immediately gathered in sieves, and are killed by exposure to the vapour of vinegar; they are then dried in stoves. When perfectly dry, cantharides are immediately put into air-tight boxes, containing a little sulphate of lime or camphor, the former to keep them dry, and the latter to preserve them from the attacks of mites and other insects, by which they are devoured.

P. P.—Each cantharis is from six to ten lines long, and about a

grain and a half in weight; it has two wing-covers or elytræ, long, flexible, of a golden-green colour; two membranous, transparent wings, inferior, folded; antennæ, black, filiform, longer than the head; and a longitudinal furrow along the head and neck. Cantharides have a faint, disagreeable odour, and a resinous, very acrid taste. They are readily reduced to powder, which in the finest state presents numberless glistening green particles of the elytræ; this is their most distinguishing characteristic, Orfila having recognised them in the human stomach nine months after interment.

C. P.—Cantharides consist of a white crystalline substance named *cantharidine*, of a yellow fat oil, a concrete green oil, a yellow viscid substance, a black substance, osmazome, uric, acetic, and phosphoric acids, and some salts. Its active properties are due to cantharidine, which may be obtained by acting on the powder with rectified spirit, distilling off the spirit, and crystallizing; it is a neutral substance, insoluble in water, but soluble in boiling alcohol, ether, the fixed and volatile oils, and in the alkalies.

Adulterations.—By the characters given above, cantharides may be distinguished from other insects which resemble them, and on the Continent are said to be frequently mixed with them. They are best protected from the attacks of mites, which destroy their activity, by keeping in well-stoppered bottles and adding a few drops of strong acetic acid (Pereira), or a few grains of camphor, which I have found very effectual. In powder they are said to be adulterated with euphorbium, a fraud not easily detected.

Th. E.—The most important medicinal property of the Spanish fly is its vesicating power, which will be considered hereafter. (See *Epispastics.*) In large doses, it is a powerful irritant poison; in small or medicinal doses, it acts as a stimulant to the urino-genital organs, producing diuresis, and exciting the venereal appetite; but according to Christison, the latter effect is not produced unless it be taken in poisonous doses. As a diuretic, cantharides are not much used, in consequence of the dangerous symptoms which sometimes arise even from small doses; those who have employed them state that they prove beneficial in incontinence of urine caused by paralysis of the neck of the bladder, and when it occurs in young persons during sleep. They have also been highly praised by many as a remedy for gleet, leucorrhœa, and chronic mucous discharges from the urinary organs.

D. & M. of Adm.—Cantharides are seldom employed internally in the form of powder; the dose is gr. ss. to gr. ij., made into pill with extract of liquorice or conserve of roses.—*Tinctura Cantharides*, D. L. E. (Cantharides (in powder, D.; bruised, L.), ʒij. (ʒss., L. E.); proof spirit, *by measure*, ℔iss. (Oij., L. E.); digest for 7 (14, L.) days, and filter. "It may be obtained more conveniently and expeditiously by percolation, provided the cantharides be reduced to coarse powder, and left with a little of the spirit in the state of pulp for 12 hours before the process of percolation is commenced," E.) Dose, min. x., gradually increased to min. xl.; it should be given in at least an ounce of some emulsion, or of decoction of linseed or barley.

In cases of poisoning with cantharides, we are not acquainted with any antidote; but emetics, emollient and mucilaginous drinks, bloodletting, general and local, opiates by the mouth and rectum, and general antiphlogistic treatment, should be resorted to.

DIGITALIS PURPUREA, FOLIA, D. DIGITALIS FOLIA ET SEMINA, L. DIGITALIS, E. *The leaves* (*and seeds*, L.) *of Digitalis purpurea. Foxglove.*—An indigenous, biennial herb; belonging to the natural family *Scrophulariaceæ*, and to the Linnæan class and order *Dydynamia Angiospermia.*

B. C.—Stem erect, three to four feet high; leaves large, veiny, ovato-lanceolate, crenate, downy; flowers numerous, purple, spotted within, drooping, in very long spikes.

P. U. & M. OF PREP.—The leaves are gathered in the months of June and July, just before the plant comes into flower, and the mid-rib and stalk removed; they are dried with stove heat in a dark place. The seeds are very seldom employed.

P. P.—The dried leaves of digitalis, when properly preserved, are of a bright-green colour; they have scarcely any odour, but the taste is nauseous and acrid.

C. P.—They consist of volatile oil, a concrete flocculent volatile matter, fatty matter, extractive, tannin, &c.; and, according to some analyzers, a peculiar alkaloid which has been named *digitalin.* The leaves yield their active properties to water, alcohol, ether, and the weak acids. The sesqui-salts of iron produce a dark, and solution of gelatin a white flaky precipitate with infusion of digitalis, indicating the presence of tannin.

Digitalis is not liable to adulteration. The powder should be of a fine green colour, and possess the acrid taste of the fresh plant.

TH. E.—Digitalis, in small doses gradually augmented, operates as a special stimulant to the kidneys, increasing the secretion of urine; in somewhat larger doses, or when its use is continued for a longer period, it acts as a *sedative* to the vascular system. (See *Sedatives.*) As a diuretic in the various forms of dropsy, digitalis has acquired a high reputation; but later experience has shown that it proves most serviceable in those symptomatic dropsical effusions which take place in the cellular membrane of the extremities and of the face, and which depend on diseases of the heart, of the kidneys, or of the liver. It is also better adapted as a diuretic for persons of a weak or enfeebled habit of body, than for the strong or the robust; and should any inflammatory symptoms be present, antiphlogistic treatment should be had recourse to before employing digitalis. The diuretic action of foxglove is much promoted by combining it with small doses of calomel, or with other remedies of this class, as squill, juniper, the diuretic salts of potash, &c.; when there is much debility present, preparations of iron are advantageously combined with it.

D. & M. OF ADM.—Of the powder, gr. ss. every six hours, its operation being aided by the use of diluents, and the surface of the body should be kept cool; administered thus, it generally produces a copious flow of urine after the fifth or sixth dose.—*Infusum Digitalis*, D. L. E. (Digitalis, dried, ʒi. (ʒij., E.); spirit of cinnamon, ʒss.

(f℥i., L.; f℥ij., E.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oi., L..; f℥xviij., E.); digest for 4 hours in a covered vessel, strain (through linen or calico, E.), and add the spirit.) This is the best preparation of digitalis; the dose is f℥ij. to f℥ss., every six hours.—*Tinctura Digitalis*, D. L. E. (Digitalis, dried (and coarsely powdered, D.; in moderately fine powder, E.), ℥ij. (℥iv., L. E.); proof spirit, *by measure*, ℔j. (Oij., L. E.); macerate for 7 (14, L.) days, and strain. "Best prepared by percolation, as directed for tincture of capsicum; if f℥xl. of spirit be passed through, the density is ·944, and the solid contents of a fluid ounce amount to gr. xxiv.," E.) This tincture, if well prepared, has a greenish colour when viewed by transmitted light. Dose, min. xx., three times a day; it may be given in f℥i. of decoction of broom-tops, combined with sweet spirits of nitre and compound spirit of juniper.—*Pilulæ Digitalis et Scillæ*, E. (Digitalis and squill, of each, one part; aromatic electuary, two parts; beat into a proper mass with conserve of red roses, and divide into four-grain pills.) An excellent diuretic pill. Dose, one pill every five or six hours.

Incomp.—Sulphate, and tincture of the muriate, of iron; the preparations of cinchona bark; and the acetates of lead.

Juniperus communis, cacumina, fructus (baccæ, D.), et oleum, D. L. E. *The tops, the fruit, and the volatile oil of the fruit of Juniperus communis; Common Juniper.*—Indigenous; belonging to the natural family *Coniferæ*, and to the Linnæan class and order *Diœcia Polyandria.*

B. C.—A bushy shrub from two to eight feet high, evergreen; leaves linear, mucronate; flowers appearing in May, axillary, small; fruit, a berry (*galbulus*), three-seeded, requiring two seasons to arrive at maturity.

P. U. & M. of Prep.—The tops are cut in spring before the plant flowers, and the berries are gathered when ripe; both are dried with stove heat; the oil is obtained from the berries by simple distillation.

P. P.—*Juniper berries* are spherical, somewhat larger than a pea, of a bluish-black colour; they have a strong aromatic, terebinthinate odour, and a sweetish, pungent, terebinthinate taste. They are imported from Hamburg and from several of the Mediterranean ports. *Juniper tops* have a similar odour and taste, but much weaker. *Juniper oil* is limpid, transparent, lighter than water, and of a very pale-greenish colour. It has the peculiar odour and taste of the berries in a marked degree. Its composition is $C^{10}H^8$, and its sp. gr. ·911.

C. P.—The medical properties of the juniper are due to the volatile oil; the berries contain, besides, resin, sugar, gum, wax, and some salts of lime. The tops and berries yield their active principles to boiling water and to alcohol.

Th. E.—Juniper is a stimulating diuretic, promoting the secretion of urine, to which it communicates its peculiar odour. It is chiefly used as an adjunct to other diuretics in dropsical affections; its use is contra-indicated if the kidney be diseased, or if any inflammatory symptoms be present.

D. & M. of Adm.—The berries may be given in the form of in-

fusion, prepared by infusing for an hour in a covered vessel ʒj. of the bruised berries in fʒxx. of boiling water. Dose, fʒiv. three or four times a day; the tops are at present scarcely ever employed; the oil may be given rubbed up with sugar or in some spirituous vehicle, in doses of min. v. to min. x. It is to the presence of this oil that the spirit called *Geneva* or *Hollands* owes its peculiar flavour and the diuretic properties it possesses.—*Spiritus Juniperi comp.*, D. L. E. (Juniper berries, bruised, ℔j. (ʒxv., L.); caraway, bruised, and fennel, bruised, of each, ʒiss. (ʒij., L.); proof spirit, cong. j. (Ovij., E.); water sufficient to prevent empyreuma (Oij., L. E.); macerate for 24 (48, E.) hours, add the water, and distil a gallon (Ovij., E.); "mix, and distil a gallon with a slow fire," L.) A powerful diuretic, introduced into the pharmacopœias as a substitute for *Geneva*. Dose, fʒij. to fʒiv. Generally used as an adjunct to stimulating diuretic mixtures.

Pareira, L. E. *Root of Cissampelos Pareira; Pareira brava.*—This plant is an inhabitant of the West Indian isles and of the South American Main; it belongs to the natural family *Menispermaceæ*, and to the Linnæan class and order *Diœcia Monadelphia*.

B. C.—A climbing shrub, with a woody, branching root; leaves smooth, silky beneath; flowers small, yellow; berry scarlet, roundish, hispid.

P. P.—Pareira root is imported in cylindrical pieces, from half an inch to three inches in diameter, and from five or six inches to three or four feet in length. It is covered externally with a dark-brown cortex, which is thin, and firmly adhering; internally the wood is very porous, of a pale reddish-yellow colour. It is odourless, but has a sweetish, aromatic, intensely bitter taste.

C. P.—It consists of a soft resin, bitter extractive (*cissampelin*), on which its activity depends, fecula, nitrate of potash and other salts, colouring matter, &c. It yields its virtues to both cold and boiling water.

Th. E.—Pareira is a tonic diuretic, acting specifically on the urinary organs, increasing their secretion, and, at the same time, checking discharges from the mucous membrane of the bladder and urethra. It is with the latter intention only that it is ever employed at present; and according to Sir Benjamin Brodie, it has a great influence over the ropy mucous discharge of chronic inflammation of the bladder.

D. & M. of Adm.—In powder, a bad form, ʒss. to ʒi.—*Extractum Pareiræ*, L. E. (Prepared as extract of Gentian.) Dose, gr. x. to ʒss., generally given as an adjunct to the infusion.—*Infusum Pareiræ*, L. E. (Pareira, ʒvi.; boiling (distilled, L.) water, Oj.; macerate for two hours in a lightly-covered vessel and strain, "through linen or calico," E.) Much too weak a preparation; the quantity of root employed might be doubled with advantage. Dose, fʒj. to fʒiv., three or four times a day. Christison recommends the infusion to be prepared with cold water and by the process of percolation, but boiling water more completely extracts the bitter principle.—*Decoctum Pareiræ*, Brodie. (Pareira, ʒss.; boiling

water, Oiij.; boil down to Oj., with a gentle heat.) Dose, f℥j. to f℥iij., three or four times a day. This is the preparation in most general use.

INCOMP.—The sesqui-salts of iron; the acetates of lead; and tincture of iodine.

POTASSÆ ACETAS.—*Acetate of Potash* (described in the division *Cathartics*), dissolved in water and given in small doses frequently repeated, operates as a mild but certain diuretic. It is most generally employed as an adjunct to other remedies of this class, in ascites and hydrothorax. Dose, as a diuretic, gr. x. to gr. xx.; it is best administered in decoction of broom tops, or of Pyrola.

POTASSÆ BITARTRAS.—*Bitartrate of Potash* (described in the division *Cathartics*), in small doses diluted with water, or combined with other diuretics, increases the secretion of urine remarkably, and, consequently, is very generally employed in all forms of dropsy. Dose, a sa diuretic, gr. xx. to ℥j., frequently repeated.—*Imperial*, an excellent diuretic and refrigerant drink in febrile diseases, is prepared by dissolving ℥i. or ℥ij. of bitartrate of potash in Oj. of boiling water, and flavouring with lemon peel and sugar.—*Cream of tartar whey*, used for the same purposes, is prepared by boiling ℥iss. of the bitartrate in Oj. of new milk, and straining, to remove the curd. Either of these drinks may be taken *ad libitum*.

POTASSÆ NITRAS, D. L. E. *Nitrate of Potash; Nitre; Saltpetre; Sal-prunelle.*

P. P.—A solid, colourless salt, in striated, prismatic crystals, generally six-sided, with dihedral summits, semitransparent, inodorous, having a cooling, saline, slightly bitter taste. Sp. gr., 1·933.

C. P.—It is composed of one eq. of potassa, and one of nitric acid (KO, NO^5), is anhydrous, permanent in the air, fusible by a heat below redness into a limpid liquid, in which state, when cast in moulds, it forms *sal-prunelle;* by a strong heat it is decomposed into oxygen, and hyponitrite of potash. Nitre is soluble in four parts of water at 60°, and in about half its weight of boiling water; during the solution cold is generated; it is insoluble in absolute alcohol.

PREP.—Nitrate of potash is an article of the Materia Medica; it is imported into Britain chiefly from the East Indies, where it is obtained by lixiviating the surface of the soil of certain districts, dissolving out with water the saline matters contained therein, filtering and crystallizing; after importation, the salt is purified by solution and recrystallization. The *Dublin College* directs the commercial salt to be farther purified "by dissolving in two parts of boiling water, filtering and crystallizing," when it constitutes the *Potassæ nitras purificatum*.

Adulterations.—Nitrate of potash, as met with in commerce, is often contaminated with sulphate or muriate of potash; the presence of the former is detected by solution of muriate or nitrate of baryta; that of the latter, by solution of nitrate of silver, causing white precipitates, in a solution of the salt in distilled water.

TH. E.—In large doses, from ℥ss. to ℥ij., nitre acts as an irritant

to the gastro-intestinal mucous membrane, producing sometimes nausea, vomiting, purging, and even death. In small doses, gr. xxx. to gr. xl., it increases the flow of urine, in which secretion it can be detected soon after it has been swallowed. It is generally employed as an adjunct to the vegetable diuretics in anasarca and ascites, but it is inadmissible in cases where there is any tendency to irritation or inflammation of the digestive tube. Nitrate of potash is greatly inferior as a diuretic to the acetate or bitartrate, and consequently, in the present day, is more employed for its refrigerant properties. (See *Refrigerants.*)

Pyrola, D. E. Chimaphila, L. *Herb of Chimaphila umbellata*, E.; *of Chimaphila corymbosa*, L.; *of Pyrola umbellata*, D. *Winter-green; Pyrola; Pipsissewa.*—This plant is a native of North America, but found also in the woods of Europe and Asia. It belongs to the natural family *Pyrolaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A small perennial under-shrub; with evergreen, cuneato-lanceolate leaves, coriaceous, smooth, and shining; flowers in a small corymb, reddish-white, fragrant.

P. U.—Although the entire herb is indicated by the colleges, the leaves only are generally employed.

P. P.—The fresh leaves, when bruised, have a strong, unpleasant smell, but in the dry state they are odourless; they have a bitter, astringent, slightly aromatic taste.

C. P.—They contain bitter extractive, resin, tannin, &c.; the medicinal virtues probably depend on the combination of these three substances; they are communicated to boiling water by infusion, but more completely by decoction.

Th. E.—Pyrola leaves operate as a tonic diuretic, exerting a specific influence on the urinary organs, increasing the secretion of urine, and, according to many observers, diminishing the secretion of lithates. It has been chiefly used in dropsies occurring in the old and debilitated, and in chronic mucous discharges from the bladder and urethra. In the advanced stages of *albuminuria*, where diuretics are sometimes called for, I have administered the decoction of this herb with the best effects.

D. & M. of Adm.—Never given in powder.—*Decoctum Pyrolæ*, D.; *Chimaphilæ*, L. (Pyrola, ʒi.; water (distilled, L.), *by measure*, ℔ij. (Oiss., L.); "macerate for six hours, take out the pyrola, bruise, and replace it; boil down to ℔ij. *by measure*, and strain," D.: "boil down to a pint, and strain," L.) Dose, fʒi. to fʒij., three or four times a day. An extract may be prepared by evaporating the decoction to a proper consistence; it is not used in Britain, but is much employed in America, in doses of gr. v. to gr. xv.

Incomp.—The sesqui-salts of iron.

Scilla, D. L. E. *The bulb of Scilla Maritima*, D. L.; *of Squilla Maritima*, E. *Squill.*—A native of the shores of the Mediterranean, of France, and of Portugal; belonging to the natural fam-

ily *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia*.

B. C.—Bulb very large, sending up annually a scape or flowering-stem from two to three feet high, terminated by a dense, long raceme of white flowers; the leaves, which appear after the flowers, are broadly lanceolate, 12 to 18 inches long.

P. U. & M. of Prep.—The bulb, which is the officinal part of the plant, is dug up in autumn, divided into four parts, the centre cut out and rejected as being inert, and the remainder cut into thin slices, which are dried quickly with a gentle heat. Sometimes, however, the bulb is imported entire. Squill is brought from Malta, and other Mediterranean ports; also from St. Petersburg and Copenhagen.

P. P.—The entire bulb varies in size from that of the fist to that of a child's head, ovoid, covered externally with layers of thin, membranous, reddish (*squilla rubra*), or whitish (*squilla alba*) scales; internally, it is composed of thick, fleshy, concentric scales, of a pale rose colour. Dried squill is in yellowish, somewhat translucent slices, brittle, but readily attracting moisture, when they become flexible; it is odourless, but has an acrid, very nauseous taste.

C. P.—Squill consists of a crystallizable alkaloid, *Scillitina*, probably the active principle of the drug, of tannin, gum, uncrystallizable sugar, acrid volatile matter, and some salts. It yields its virtues to water, alcohol, vinegar, and the dilute acids. The sesqui-salts of iron communicate a deep blue colour to the infusion, but it is not affected by gelatin or by tincture of iodine.

Th. E.—In large doses, squill acts as a narcotico-acrid poison, twenty-four grains of the powder having proved fatal. In medicinal doses it operates as an emetic, expectorant, and diuretic; for the latter purpose it is usually given in combination with digitalis and calomel, when it seldom fails to produce increased flow of urine, and, at the same time, promote the absorption of the effused fluid in dropsies. Squill is better adapted for local than for general dropsy; it is generally held to be inadmissible when inflammatory symptoms are present.

D. & M. of Adm.—As a *diuretic*.—*Pulvis Scillæ*, D. (Having removed the membranous integuments, cut the bulb of squill into slices, dry with an inferior heat, reduce to powder, and keep in glass bottles with ground stoppers.) Dose, gr. j. to gr. iij., usually given in the form of pill made with conserve of roses or some soft extract.—*Tinctura Scillæ*, D. L. E. (Squill (in coarse powder, E.), ʒiv. (ʒv., L. E.); proof spirit, *by measure*, ℔ij. (Oij., L. E.); macerate for 7 (14, L.) days; let the sediment settle, and pour off the clear liquor (strain, L.); "prepare by percolation as for tincture of cinchona, but without packing the pulp firmly in the percolator," E.) Dose, min. x. to min. xxx. An excellent addition to infusion of digitalis or decoction of broom tops.—*Acetum Scillæ*, D. L. E. (Squill, fresh dried, ℔ss. (ʒxv., L.; ʒv., E.); distilled vinegar, *by measure*, ℔iij. (Ovj., L.; Oij., E.); rectified (proof, L. E.) spirit, *by measure*, ʒiv. (Oss., L.; fʒiij., E.); macerate the squill (with a gentle heat, L.) with the vinegar for 7 days (24 hours, L.) in a covered glass vessel: express the liquor, and as soon as the fæces have subsided, pour off and add the spirit.) Dose, fʒss. to fʒiss., in

some aromatic or distilled water.—*Vinum Scillæ*, P. (Squill, one part; white wine, 16 parts; macerate for 12 hours, and strain.) Dose, f℥j. to f℥iij.

Scoparium, E. Scoparius, L. Spartium scoparium, cacumina, D. *The (fresh, L.) tops of Cytisus scoparius*, L. E.—*of Spartium scoparium*, D. *Broom tops.*—The common broom is an indigenous shrub, belonging to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Decandria.*

B. C.—A bushy shrub from three to six feet high; with long, straight, reen branches; and large, bright yellow, papilionaceous flowers.

P. P.—The fresh green tops, the only officinal part, have a peculiar odour when bruised, and a bitter, somewhat nauseous taste.

C. P.—Broom tops have not been analyzed; their medicinal virtues appear to depend on bitter extractive and carbonate of potash, which are extracted by boiling water.

Th. E.—In the form of infusion or decoction, broom tops are an excellent and certain diuretic, seldom failing to produce a copious secretion of urine. The officinal preparations of broom tops are most generally employed as vehicles for the more active remedies of this class in dropsical effusions.

D. & M. of Adm.—*Infusum Scoparii*, L. (Broom tops, ʒi.; boiling distilled water, Oj.; macerate for four hours in a vessel lightly covered, and strain.) Dose, f℥i. to f℥ij. A bad preparation, much inferior to the decoction.—*Decoctum Scoparii*, E. (Broom tops and juniper tops, of each, ʒss.; bitartrate of potash, ℥iij.; water, Oiss.; boil down to a pint, and strain.)—*Decoctum Scoparii comp.*, L. (Broom tops, juniper berries, and dandelion, of each, ʒss.; distilled water, Oiss.; boil down to a pint, and strain.) Excellent diuretics, particularly the former, which scarcely ever fails to act on the kidneys. Dose, f℥i. to f℥iv., three or four times a day.—*Extractum Spartii Scoparii*, D. Prepared as the simpler extracts; seldom used. Dose, gr. x. to ℥ss., two or three times a day.

Sodæ acetas, D. L. *Acetate of Soda.*

P. P.—In white, striated, prismatic crystals, of the oblique rhombic series. It has a faint acetous odour when moistened, and a sharp, cooling, saline, taste.

C. P.—It consists of one eq. of soda, one of acetic acid, and six of water of crystallization. It is unalterable in ordinary states of the air, but in dry, warm air effloresces slightly; it is soluble in three parts of water at 60°, and in somewhat less than its own weight of boiling water; it is also soluble in five times its weight of alcohol. Exposed to heat, it undergoes the watery fusion, loses all its water of crystallization at the heat of 550°, and at a heat of 600° it is decomposed.

Prep.—*Dub.* "Carbonate of soda, any quantity; distilled vinegar, sufficient to saturate the alkali; evaporate the filtered liquor to the density of 1276; crystallize by cooling, dry cautiously, and keep the crystals in a close vessel." An article of the Materia Medica of the London Pharmacopœia.

Th. E.—A mild diuretic, similar in operation to acetate of potash, for which it may be substituted. It is now very rarely used.

D. & M. of Adm. and Incomp.—Same as acetate of potash.

Terebinthinæ oleum.—*Oil of turpentine* (described in the division *Anthelmintics*), given in small doses frequently repeated, acts as a stimulant to the renal vessels, causing an increased flow of urine, to which it communicates a violet odour. It also possesses a specific action over the mucous membrane of the bladder and urethra, checking excessive discharges, and giving increased tonicity to the vessels which pour out the mucus. If the use of oil of turpentine be too long continued, it is apt to produce strangury, bloody urine, and even sometimes total suppression of the secretion. The dose of oil of turpentine as a diuretic is from min. x. to min xxx. It has occasionally proved serviceable in dropsical effusions, but its stimulating property forbids its employment if there be any tendency to inflammatory action. It is frequently employed with much benefit in gleet, in leucorrhœa, and in chronic cystirrhœa. Under the use of oil of turpentine, the quantity of lithic acid in the urine is much increased, owing to which it frequently proves very beneficial in chronic rheumatism occurring in the old and debilitated.

Terebinthina Chia, D. L. E. *Liquid resin of Pistacia terebinthus. Chian turpentine.*—This tree is a native of parts of the South of Europe, of the Grecian Archipelago, and of Syria; it belongs to the natural family *Anacardiaceæ*, and to the Linnæan class and order *Diœcia Pentandria.*

B. C.—Stem 30 to 35 feet high; leaves pinnate, young leaves reddish; flowers in compound racemes; fruit globular, purplish, enclosing an osseous, one-seeded nut.

P. U. & M. of Prep.—The liquid, resinous exudation, which constitutes the Chian turpentine of commerce; it is obtained chiefly in the island of Scio, by making incisions into the trunk of the tree, and allowing the juice which flows out to harden on large flat stones placed under the trees; each tree yields from 8 to 10 ounces only.

P. P.—It is of the consistence of very thick honey, nearly solid; of a pale greenish-yellow colour; has a weak terebinthinate, fragrant odour, and a slightly bitter taste.

C. P.—Chian turpentine consists of volatile oil and resin; it resinifies by keeping, or by exposure to the air, when it loses its fragrance. This turpentine is very scarce, Strasburg or Venice turpentine being usually substituted for it.

Th. E.—It resembles, in its action on the urinary organs, oil of turpentine; but by many it is supposed to act more effectually in checking chronic mucous discharges.

D. & M. of Adm.—Gr. x. to gr. xxx., three or four times a day: it may be made into pills with powdered liquorice root or gum-arabic, or it may be given in emulsion with yolk of egg or mucilage.

Terebinthina Canadensis, L. Balsamum Canadense, D. E. *Canada balsam; Liquid resin of Pinus balsamea*, D. L.—*of Abies balsamea*, E.—A native of the coldest regions of North America,

belonging to the natural family *Coniferæ*, and to the Linnæan class and order *Monœcia Monadelphia*.

B. C.—An elegant tree; stem about 40 feet high; leaves solitary, flat, sub-erect above; cones erect on the branches, large, nearly cylindrical, of a beautiful, deep, glossy, purple colour, fragrant as well as the leaves.

P. U. & M. of Prep.—The resinous exudation, improperly termed balsam; it is obtained either from little vesicles which form on the bark, or by making incisions quite through the bark into the wood, and collecting the juice as it exudes.

P. P.—When fresh it is of the consistence of honey, but it gradually concretes into a yellow, translucent, resinous-looking mass, of a peculiar agreeable, terebinthinate odour, and an acrid, rather nauseous taste.

C. P.—It consists of volatile oil, two resins, one soluble, the other insoluble in alcohol, extractive, and some salts. It is insoluble in water, but forms an emulsion with it by means of mucilage or yolk of egg.

Th. E.—The action of Canada turpentine on the urinary organs is similar to that of the other turpentines; it is more generally preferred for the treatment of the advanced stages of gonorrhœa, of gleet, of leucorrhœa, and of cystirrhœa, in which diseases it proves highly beneficial.

D. & M. of Adm.—Similar to the last.

Urea. *A peculiar principle contained in the urine of many animals.*

P. P.—In colourless, transparent crystals, long, flattened, four-sided prisms; heavier than water. They are inodorous, but have a cooling, sharp taste.

C. P.—It consists of $C^2O^2H^4N^2$. It is soluble in its own weight of water at 60°, in 4 or 5 parts of cold alcohol, and in 2 parts of boiling alcohol. It is unalterable in dry air, but deliquesces in damp air; it fuses at 248°, and is decomposed at a higher temperature. It is a feeble base, combining with most acids without neutralizing them.

Prep.—By evaporating fresh human urine to the consistence of a sirup, treating with nitric acid, washing well with distilled water the nitrate of urea, decomposing with carbonate of potassa, dissolving the precipitated urea in alcohol, and crystallizing. By the following elegant process of Liebig, ʒiv. of perfectly colourless, crystallized urea may be procured from ℔j. of ferrocyanate of potash: "Mix together 28 parts of perfectly dry ferrocyanate of potash with 14 of oxyde of manganese, both in fine powder; place the mixture upon a smooth iron plate, and expose it to a dull red heat over a charcoal fire. By-and-by it will begin to burn of itself, when it is to be frequently stirred about. After it cools, it is to be lixiviated with cold water. The solution is to be treated with 20½ parts of dry sulphate of ammonia, whereupon a copious deposite of sulphate of potash will ensue. It is then to be allowed to stand for some time in a warm place (under 212° F.), so as to concentrate the supernatant liquor, which is afterward to be decanted, treated with alcohol of a density of ·835 to ·865, and crystallized."

Th. E.—Urea is at present scarcely ever employed as a diuretic, although, from the reports of several French practitioners, it appears to promote remarkably the secretion of urine, without producing any general disturbance of the animal economy.

D. & M. of Adm.—Gr. x. to gr. xx., dissolved in sweetened distilled water. It may also be given made into pill or bolus, with any soft extract, or with honey, or treacle.

CHAPTER IX.

EMETICS.

(Vomits.)

Emetics are substances which are used for the purpose of producing vomiting. The number of medicines employed with this intention are but few, and they act either *specifically*, that is, they excite vomiting when injected into the veins, as well as when introduced into the stomach; or their operation is *topical*, producing vomiting only when taken into the stomach. Tartar emetic is an example of a *specific*, mustard of a *topical* emetic. It would be out of place here to enter into any consideration of the phenomena and pathology of vomiting; it must suffice to say, that independent of the mere evacuation of the contents of the stomach, emetics in general influence sympathetically the entire system. In prescribing emetics, attention must be paid to the differences which exist in their mode of operation; some medicines of this class, as sulphate of zinc and sulphate of copper, produce their effects very rapidly, exciting vomiting almost immediately after they are swallowed, without occasioning much nausea or depression. Tartar emetic operates more slowly, and produces great nausea, accompanied with a feeling of feebleness and exhaustion; while the vegetable emetics, as ipecacuanha and squill, require a much longer time for their operation. In selecting a particular remedy of this class, therefore, we should be always guided by the nature of the indication which is to be fulfilled. Emetics should be employed with great caution where there are symptoms of determination of blood to the cerebral organs, in consequence of the obstruction of the circulation which is occasioned during the act of vomiting; for the same reason, also, they ought not to be administered in diseases of the larger arteries, as in aneurism. From the violent action of the abdominal muscles which is caused, the act of vomiting is attended with great risk in the advanced stages of pregnancy, in hernia, and in prolapsus uteri.

[The act of vomiting, under the influence of what the author calls a specific or a topical emetic, does not differ in its pathology, when thus artificially excited, from the same act performed spontaneously under various morbid conditions of the vital organs, or when produced by irritation of individual nerves transmitted to the brain, as in tickling the fauces by a feather, or irritating the same part by the finger. In this latter mode of producing vomiting, the irritant is supposed to act through the naso-palatine branch of the fifth pair, and this with much plausibility. Those who concur in ascribing the act of vomiting to nervous irritation thus transmitted, in all cases explain the effect of emetics, and the vomiting occasion-

ed by the passage of calculi through the ducts of the ureter or gall-bladder, by the connexions of the pneumogastric nerve; and that produced by the irritation in the uterus attendant upon early pregnancy, or by intestinal obstruction, is traced to the spinal nerves, and thus reaches the sensorium. In the cases dependant on cephalic irritation, it is supposed that the communication is made to the diaphragm and abdominal muscles partly through the vagus nerve and partly through the splanchnic and sympathetic nerves, while the spinal cord and spinal nerves are simultaneously employed in conducting the impression so as to produce the mechanical actions of the process. The vomiting attendant upon sea-sickness, and other similar agitations of the body, is supposed to fortify the opinion of the nervous transmissions of irritation to the brain, and thence back to the muscles concerned; and this theory is deemed not inconsistent with the vomiting excited by injecting specific agents into the veins, which are supposed to act through the circulation in the same way.]

Ammoniæ carbonas.—*Sesquicarbonate of ammonia* (described in the division *Antacids*), given in doses of gr. xxx. or upward, acts as a stimulating emetic, without producing much nausea or depression. It is, consequently, employed in cases of great debility, when the use of an emetic is indicated; as in chronic bronchitis occurring in broken-down constitutions, and in the suffocative catarrh of typhus. But, in consequence of the uncertainty of its operation, mustard is generally preferred in those cases.

Antimonii et potassæ tartras.—*Tartar emetic* (described in the division *Diaphoretics*), administered in doses of one or two grains dissolved in water, operates as a powerful emetic, producing at the same time general depression and much nausea. The act of vomiting does not occur for from twenty minutes to half an hour after it has been taken, but it is then usually energetic, and frequently repeated. The emetic action of tartar emetic is *specific*, as it operates, not only when introduced into the stomach or rectum, but when injected into the veins, or otherwise introduced into the vascular system. It is employed as an emetic in all cases in which we wish to produce a powerful impression on the system, and, at the same time, lower the circulation; as in the early stages of febrile or inflammatory diseases, when, if given at the very commencement of the symptoms, the disease is frequently cut short; with this view it is employed in common continued fever, in acute ophthalmia, in croup, in hoopingcough, in hernia humoralis, in bubo, &c. In cases of threatened suffocation from the lodgment of solid bodies in the œsophagus, tartar emetic has been successfully injected into the veins to produce vomiting, and the expulsion of the substance. In cases of poisoning, it is inferior to other remedies of this class, in consequence of the slowness of its operation and its depressing effects. It is best administered in distilled water; gr. ij. may be dissolved in f℥viij. of water, and of this f℥ij. should be

administered every ten minutes until vomiting is produced. It is sometimes given in the form of enema; for this purpose, gr. vj. are to be dissolved in Oj. of tepid water; in this form, however, its operation is uncertain. For injecting into the veins, gr. ij. or gr. iij. are dissolved in f℥ij. of tepid distilled water.

Cupri sulphas.—*Sulphate of Copper* (described in the division *Astringents*), in doses of from gr. xij. to gr. xv., operates as a speedy and effectual emetic, producing generally a single but complete evacuation of the contents of the stomach, without causing any depression of the system. It is alone applicable to cases of poisoning, but as it is apt to act as a powerful irritant, if it do not speedily produce vomiting, sulphate of zinc should be preferred to it for that purpose; for the same reason, it should be given in the full doses above mentioned.

Ipecacuanha, L. E. Cephaëlis ipecacuanha, radix, D. *Ipecacuanha. Root of Cephaëlis Ipecacuanha.*—A native of Brazil, belonging to the natural family *Cinchonaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Root perennial, generally simple; stem shrubby, ascending, 2 to 3 feet long; leaves opposite, ovato-lanceolate, 4 to 8 placed at the end of the stem and branches; flowers white, in terminal, pendulous heads; fruit, a fleshy, black berry.

P. U. & M. of Prep.—The roots; they are gathered at all seasons of the year, cut from the stems, dried in the sun, and packed in bundles of various sizes.

P. P.—Ipecacuanha root is in pieces from three to six inches long, about the thickness of a writing pen, irregularly twisted and bent, presenting many circular depressions at short intervals, which give the root an annulated appearance, resembling a number of rings placed side by side on a common axis. It breaks with a short, clean fracture, presenting an outer cortical portion of a grayish, or grayish-brown colour, and a white woody centre (*meditullium*). It is readily reduced to powder, which is of a pale brownish-yellow colour, has a faint, nauseous, peculiar odour, and a bitter, somewhat acrid taste.

C. P.—The cortical portion of the root is the most active; according to the analysis of Pelletier, it consists of 16 per cent. of a peculiar principle named *emetina*, and in which the active properties of the drug reside, 2 of a fat oily matter, 6 of wax, 10 of gum, 42 of starch, and 20 of lignin. Emetina is prepared by dissolving 1 part of an alcoholic extract of ipecacuanha in 10 parts of water, filtering to remove the fatty matter, and adding 1 part of calcined magnesia; evaporating with a gentle heat to dryness, pulverizing, washing with cold water, drying and pulverizing again; exhausting the powder with boiling alcohol, distilling off the spirit, treating the dry residue with weak sulphuric acid and animal coal; and, finally, precipitating the *emetina* with ammonia. Emetina, as commonly met with, is a dark, pasty-looking substance; but when pure, is white and pulverulent, inodorous, with a faint, bitter taste, alkaline, very soluble in alcohol, sparingly soluble in water, and less so in ether; it is composed of $C^{30}H^{25}N^{1}O^{9}$. Ipecacuanha yields its active principles to water and to alcohol.

Adulterations.—Spurious ipecacuanha roots are frequently substituted, especially on the Continent, for the true root, but as none of them present the precise characters of the latter, as given above, the fraud is readily detected. The powder is generally supposed to be adulterated, but of this we can only judge by its medicinal activity.

Th. E.—In full medicinal doses, ipecacuanha operates as a certain but mild emetic, at the same time increasing remarkably the secretions. It resembles tartar emetic in the time which elapses after it has been taken before its effects are produced, and also in the act of vomiting being repeated several times; and it differs from that substance in not causing so much nausea or general depression; it has less tendency to act on the bowels. As an emetic, ipecacuanha is adapted for children, for the old and debilitated, or for delicate females, where we wish to produce vomiting without depressing the vital powers; and also for cases where the indication is to increase the secretions of the pulmonary organs. Thus, it is used with benefit in the gastric febrile disorders of children, to evacuate the contents of the stomach; at the approach of the paroxysm in ague, hysteria, or hoopingcough, when it frequently checks the development of the fit; and it is generally given in conjunction with tartar emetic, in the febrile and inflammatory disorders in which that substance is employed. As an emetic, ipecacuanha is to be preferred to tartar emetic, where there is any tendency to irritation or inflammation of the digestive organs; it is inferior to the metallic sulphates in cases of poisoning, on account of the slowness of its operation.

D. & M. of Adm.—In powder, as an emetic, the usual dose is from gr. xij. to gr. xx.; but gr. v. or gr. vj. frequently are sufficient; it is best given mixed with warm water, and its action promoted by tepid drinks; gr. j. is usually sufficient to act as an emetic for an infant. In combination with tartar emetic, gr. xij. are mixed with gr. j. of that substance.—*Vinum Ipecacuanhæ*, D. L. E. (Ipecacuanha root, bruised (in moderately fine powder, E.), ʒij. (ʒiiss., L. E.); sherry, *by measure*, ℔ij. (Oij., L. E.); macerate for 14 (7, E.) days, and filter.) As an emetic, very generally employed for children, in doses of from min. xx. to fʒi.; seldom for adults; dose, fʒij. to fʒiv.—*Sirupus Ipecacuanhæ*, E. (Ipecacuanha, in coarse powder, ʒiv.; rectified spirit, Oj.; proof spirit and water, of each, fʒxiv.; sirup, Ovij.; digest the ipecacuanha in fʒxv. of the rectified spirit at a gentle heat for 24 hours; strain, squeeze the residue, and filter. Repeat this process with the residue and proof spirit, and again with the water, unite the fluids and distil off the spirit till the residuum amount to fʒxij. Add to the residuum fʒv. of the rectified spirit, and then the sirup.) This sirup is as effectually and much more simply prepared by dissolving an alcoholic extract of the root in distilled water, and adding sirup. It is an excellent preparation for children; about min. xl. of the *Edin.* preparation are equal in strength to one grain of ipecacuanha; the dose, as an emetic for adults, is fʒij.; for children, min. xx. to fʒi.

Incomp.—The salts of lead and of mercury, and astringent vegetable infusions.

[Sanguinaria Canadensis. *Bloodroot*, U. S.—The root, indigenous, belonging to the natural family *Papavaraceæ*, and the Linnæan class and order *Polyandria Monogynia*.

P. P.—Powder of the root brownish-red; has a faint narcotic odour; called bloodroot from the reddish colour of its juice.

C. P.—It yields its virtues to water and alcohol, and contains a peculiar alkaloid called *Sanguinaria*.

Th. E.—It is an acrid, narcotic, and stimulant emetic, uncertain, however, in its effects, though favourably estimated by many American physicians. As an alterative and expectorant, it is given in small doses, in catarrhal and bronchial affections, and in pertussis. It is commonly combined with ipecacuanha or antimony.

D. & M. of Adm.—As an emetic, the dose is 10 to 20 grs. The preferable form is that of tincture.—*Tinctura Sanguinariæ*, U. S. P. Take of bloodroot, bruised, 4 oz.; diluted alcohol, 2 pints; macerate for 14 days, express, and filter through paper. Dose, as an alterative or expectorant, 20 or 30 drops; as an emetic, 1 to 2 drachms.]

Scilla.—*Squill* (described in the division *Diuretics*), in full medicinal doses, generally produces nausea and vomiting; its action, however, is uncertain, and therefore it is not much used as an emetic. It is sometimes given to children with this intention in hoopingcough, and in the advanced stages of bronchitis or of croup. In consequence of its stimulating effects, it is inadmissible where there is any tendency to inflammation. The preparation of squill usually employed as an emetic is the following: *Oxymel Scillæ*, D. L. *Sirupus Scillæ*, E. ("Honey, despumated, *by weight*, ℔ij.; vinegar of squill, *by measure*, ℔ij. (Oiss., L.); boil with a gentle heat, in a glass vessel, to the consistence of sirup," D. L. "Squill vinegar, Oij.; pure sugar, in powder, ℔vij.; dissolve with the aid of a gentle heat, and agitation," E.) Dose, as an emetic, for children, f℥i. every quarter of an hour until vomiting is produced.

[U. S. P.—*Sirup Scillæ compositus* (Hive Sirup). Take of squill and seneka, each, 4 oz., bruised; tartrate of antimony and potassa, 48 grs.; water, 4 pints; sugar, 3½ pounds.

Pour the water upon the squill and seneka, and, having boiled to one half, strain, and add the sugar; then evaporate to 3 pints, and while the sirup is still hot, dissolve in it the tartrate of antimony and potassa.

Another method:

Take of squill and seneka, both in coarse powder, each, 4 oz.; tartrate of antimony and potassa, 48 grs.; alcohol, half a pint; water, q. s.; sugar, 3½ pounds.

Mix the alcohol with 2½ pints of water, and macerate the squill and seneka in the mixture for 24 hours. Put the whole into an ap-

paratus for displacement, and add as much water as may be necessary to make the filtered liquor amount to three pints. Boil the liquor for a few minutes, evaporate to one half, and strain; then add the sugar, and evaporate until the resulting sirup measures 3 pints. Lastly, dissolve the tartrate of antimony and potassa in the sirup while it is still hot.]

SINAPIS, L. SINAPI, E. SINAPIS NIGRA, SEMINUM PULVIS, D. *Flour of the seeds of Sinapis nigra*, D. L. E.—*generally mixed with those of Sinapis alba, and deprived of fixed oil by expression*, E. *Flour of mustard; Mustard.*—Indigenous plants, belonging to the natural family *Cruciferæ*, and to the Linnæan class and order *Tetradynamia Siliquosa.*

B. C.—Annual; stem 3 to 4 feet high; lower leaves large, lyrate, rough; flowers yellow; pod with a very short beak, quadrangular; seeds dark brown. The white mustard is distinguished by the pod having a long beak, and by the seeds being yellow.

P. P.—Although the Dublin and London Pharmacopœias direct flour of mustard to be procured from the black variety only, table mustard, as met with in the shops, and which is always used in medical practice, is prepared from both varieties mixed in nearly equal proportions, and ground. Mustard is a greenish yellow powder, having an oily aspect, an acrid, burning taste, and in the dry state, a faint, nauseous smell; but when moistened it emits a strong, penetrating odour, very irritating to the eyes and nostrils. Black mustard is much more pungent than white.

C. P.—Black mustard seeds consist of a bland fixed oil, of a peculiar acid, bitter, odourless, uncrystallizable, which has been named *myronic acid;* of another peculiar principle resembling vegetable albumen and emulsion, which has been named *myrosyne;* and of a third peculiar principle, crystallizable and very volatile, named *sinapisin;* with other unimportant matters. When water is added to mustard, by the mutual action of those principles, a pungent volatile oil is formed, and may be obtained by distillation, but this oil does not pre-exist in the seeds; and it is to its formation that the active properties of mustard are due.

Adulterations.—Flour of mustard is always more or less adulterated with a variety of substances. Wheaten flour, which is generally (always, according to Christison) mixed with it, may be detected by tincture of iodine turning a cooled decoction blue. Of any other sophistications, we can only judge by the physical properties of the specimen.

TH. E.—Mustard is a powerful stimulating emetic, and should be preferred to any other remedy of this class, when the sensibility of the stomach is greatly reduced, or vital power is low. Thus, it is employed with much advantage in narcotic poisoning, in intoxication threatening apoplexy, in malignant cholera, in some forms of apoplexy and of paralysis, and in suffocative catarrh occurring in the aged or debilitated.

D. & M. OF ADM.—As an emetic, mustard is given in doses of

℥ss. to ℥i.; it is best administered mixed with f℥vj. or f℥viij. of tepid water.

Viola odorata.—The root of this plant (which has been described in the division *Cathartics*), though not officinal in the British Pharmacopœias, possesses well-marked emetic properties, which depend on the presence of an alkaloid named *violina;* this principle operates precisely similar to *emetina*, and has been found to exist in the roots of all the species of the genus viola. In their action on the system, violet roots resemble ipecacuanha, for which they would form an excellent substitute: and as many of the species are indigenous, the subject is worthy of more attention than has hitherto been bestowed on it. The dose of the powdered root is from 3ss. to 3i.

Zinci sulphas.—*Sulphate of Zinc* (described in the division *Astringents*), in full medicinal doses from gr. xv. to gr. xxx., operates as a speedy, safe, and efficacious emetic, not producing much nausea or depression. It is therefore preferred to all other medicines of this class in cases of poisoning. It is also applicable to any case in which we wish to produce a single but complete evacuation of the contents of the stomach. As an emetic, sulphate of zinc is best administered in the full doses above stated, dissolved in three or four ounces of tepid water.

CHAPTER X.

EMMENAGOGUES.

Emmenagogues are medicines which are supposed to be capable of promoting the menstrual discharge. That any substances have a direct or specific power over the uterine organs has been doubted by many, in consequence of the uncertainty of the operation of the so-called specific emmenagogues, and also as the uterus is not an organ intended for the elimination of foreign matter. But there are a few medicines which are employed to promote the menstrual secretion, and which appear to act solely as stimulants to the uterus, and these alone will be considered in this chapter. Suppression or absence of the menstrual discharge generally is the effect of some morbid state of the system, and therefore the remedies which are to be employed must have reference to this morbid state. Thus, when amenorrhœa is the consequence of general debility, we must have recourse to tonics and stimulants; and when it occurs with a state of plethora, venesection and other debilitating plans of treatment must be employed. Substances which stimulate powerfully the neighbouring organs act *relatively* on the uterine vessels, and therefore are often effectual in restoring the menstrual discharge.

Thus, some of the more *acrid cathartics*, as aloes, black hellebore, gamboge, &c.; and the *stimulating diuretics*, as the turpentines, cantharides, &c., are frequently the most certain emmenagogues.

Crocus, L. E. Crocus sativus, stigmata, D. *The stigmata of Crocus sativus; Saffron.*—A native of Asia Minor, now naturalized in England, belonging to the natural family *Iridaceæ*, and to the Linnæan class and order *Triandria Monogynia.*

B. C.—Root, a round cormus; leaves linear, with a white central stripe; flowers appearing in September and October, light purple, with red veins; style single, stigma protruded, drooping, in three deep linear divisions, fragrant.

P. U. & M. of Prep.—The stigmata; early in the morning the flowers are gathered, just as they are about to blow, and the stigmata, with part of the style, picked out, and the rest of the flower thrown away; the stigmata are then spread loosely on white paper, and dried on a small kiln of a peculiar construction. Formerly the over ripe or injured stigmata were dried under pressure between folds of paper, when they constituted what was called *Cake saffron*, now no longer met with.

P. P.—Saffron, *Hay saffron*, consists of the dried stigmata in loosely aggregated masses; the colour is deep orange, the odour powerful, and agreeably aromatic, in large quantities stupifying; the taste is pungent, aromatic, and somewhat bitter. It is imported from Spain and France, English saffron being never met with in the market at present. According to Pereira, "one grain of good commercial saffron contains the stigmata and styles of nine flowers; hence, 4320 flowers are required to yield one ounce of saffron."

C. P.—Saffron consists of albumen, mucilage, a colouring extractive matter named *polychroite*, and which constitutes 2-3ds of its weight, volatile oil, &c. It readily yields its properties to water and to alcohol, its solution in either being of a deep orange colour.

Adulterations.—In consequence of the high price of saffron, it is very much adulterated; the petals of the *Carthamus tinctorius*, of the *Calendula arvensis*, pomegranate blossoms, and fibres of smoked beef are used for this purpose. The flowers may be detected by the difference of their structure, when a specimen is soaked in water; the fibres of beef, by the odour which they emit on being burned. What is at present sometimes sold in England for *cake* saffron, consists of the petals of the *Carthamus tinctorius* made into a paste with gum-water. Of the qualities of saffron we judge by its sensible properties.

Th. E.—Saffron is a stimulant of weak power, exerting a specific influence, by no means well marked, over the uterine organs; hence it is generally said to be emmenagogue. In the present day it is scarcely ever employed in medicine, except to give odour and colour to mixtures. On the Continent it bears a high character as a remedy for the severe lumbar pains which so frequently precede or accompany menstruation.

D. & M. of Adm.—In substance, gr. xij. to 3j.—*Sirupus Croci*, L. E. (Saffron, 3x.; boiling water, Oj.; sugar, ℔iij.; infuse the saffron in the water for 12 hours in a lightly-covered vessel; strain

the liquid, and add the sugar to it.) Dose, f℥ij. to f℥ss.; chiefly used for its fine colour.—*Tinctura Croci*, E. (Saffron, chopped fine, ℥ij.; proof spirit, Oij.; prepared like tincture of cinchona, either by percolation or digestion, the former method being more convenient and expeditious.) Dose, f℥i. to f℥ij.

Ergota, L. E. [and U. S. P.]. *Acinula clavus*, L. *An undetermined fungus with degenerated seed of Secale cereale*, E. *Ergot of rye.*—Much difference of opinion exists as to what this substance really is; the latest and best authorities agree that it is a peculiar species of fungus (*Spermoëdia Clavus* of Fries and Lindley; *Ergotætia abortifaciens* of Quekett and Pereira), which is produced under certain circumstances, as yet not fully ascertained, on plants belonging to the natural families *Gramineæ*, *Cyperaceæ*, and *Palmaceæ*, but on none so frequently as on the *Secale Cereale*, or common rye.

P. P.—Ergot, or spurred rye, consists of angular, sometimes round bodies, from the third of an inch to an inch and a half in length, retaining the longitudinal depression of the sound grain, obtuse at the extremities, curved like the spur of a cock, whence the name. It is of a violet-brown colour externally, sometimes whitish; yellowish internally. In the entire state, the odour is very faint, but when powdered it has a heavy, mawkish, somewhat animal smell; the taste is acrid and disagreeable; it is firm and fragile, breaking with a clear transverse fracture. It attracts moisture if exposed to the air, swells, and becomes mouldy, and is attacked by a small insect, a species of *acarus*, which devours the interior and leaves the grain a mere husk, no longer fit for medical purposes; ergot of rye should therefore be kept in well-stopped bottles.

C. P.—According to the latest and best analysis, that of Dr. Wright, ergot consists of 31 per cent. of a thick white oil, 5·50 of osmazome, 9 of mucilage, 7 of gluten, 11·40 of fungin, 3·50 of colouring matter, 26 of fecula, and 3·10 of salts. The fixed oil, on which the active properties of the drug depend, is of a reddish-brown colour, lighter than water, and soluble in alcohol and in solutions of the caustic alkalies; it is readily procured by evaporating with a gentle heat an ethereal tincture of the ergot prepared by percolation. Ergot of rye yields its virtues to water, alcohol, ether, and the volatile oils; of these, water is the worst, and ether the best menstruum.

Adulterations.—Plaster of Paris, and common paste artfully coloured, are substituted for, or mixed with, ergot of rye; they are difficult of detection. We should, therefore, attend to the characteristics of good ergot as given by Wright. "It should be clear and smooth on the surface, not powdery, of a deep purple colour, neither totally black nor light brown, having a full, strong odour, breaking clearly, exhibiting a pink blush interiorly, unpunctured by insects, burning with a clear, jetting flame, and being of less specific gravity than water."

Th. E.—Ergot of rye in single large doses, from ʒij. to ʒviij., produces nausea, pain in the head, and vertigo, generally followed in from twelve to twenty-four hours by delirium and stupor, with dilatation of the pupil and great depression of the pulse. In medicinal doses, from gr. xv. to gr. xl., it exerts a specific influence on the uterine organs, chiefly manifested by a stimulant effect on the muscular fibres of the uterus, exciting them to increased contraction. Ergot of rye is chiefly used in medicine to accelerate delivery in cases where the childbirth is delayed, in consequence of feeble or languid contractions of the uterus; to cause the expulsion of the placenta retained from a similar cause; to stimulate the uterus to expel sanguineous clots, hydatids, or polypi; to promote the lochial discharge, and to check leucorrhœa or hœmorrhage from the womb; all of which actions are the result of augmented contractility of the uterus. The power of ergot to produce the catamenial discharge in amenorrhœa is doubted by many; nevertheless, in chlorotic amenorrhœa, after the administration of ferruginous preparations for some days, I have in several cases employed the ethereal tincture with most beneficial results. The circumstances which contra-indicate the employment of ergot in parturition are want of dilatation of the os uteri, great rigidity of the soft parts, deformity of the pelvis, and mal-presentation. Most practitioners also agree in advising that it should not be administered in the earlier stages of labour, or in first pregnancies. The effects produced by the continued use of ergot as an article of food are very singular, and have been fully described by different writers; any detailed account of them, however, would be quite foreign to the scope of this work; I must, therefore, refer the reader to Dr. Wright's excellent treatise in the 52d and 53d vols. of the *Edinburgh Medical and Surgical Journal.*

D. & M. of Adm.—In powder, which should be always prepared for use, for a woman in labour, the dose is ℈j. repeated every half hour until ʒi. has been taken, unless its effects are sooner produced. For other cases, gr. v. to gr. x. three times a day; it may be administered diffused through peppermint or cinnamon water. There are no officinal preparations of ergot, but the following are in general use: *Infusum Ergotæ.* (Ergot, bruised, ʒj.; boiling water, f℥iv.; macerate till cold in a lightly-covered vessel, and strain.) Dose, during parturition, ½ of this, repeated at intervals of half an hour, unless its effects be sooner produced; for other cases, the dose is fʒss. to fʒi.; some aromatic tincture should be added to this preparation, and to the next, to conceal their nauseous taste.—*Decoctum Ergotæ.* (Ergot, bruised, ʒi.; water, f℥vj.; boil for ten minutes, and strain.) Dose, same as infusion.—*Tinctura Ergotæ,* Apothecaries' Hall, London. (Ergot, bruised, ℥ij.; proof spirit, Oj.; digest for 4 days, and strain.) This tincture might be more conveniently prepared by percolation. Dose, in slow parturition, fʒss. to fʒj.; in other cases, min. x. to min. xx.—*Tinctura Ergotæ etherea.* (Similarly prepared, substituting sulphuric ether for proof spirit.) The dose is the same.

Rubia tinctorum, radix, D. *Root of Rubia tinctorum; Madder.*—A native of the South of Europe, belonging to the natural family *Stellatæ*, and to the Linnæan class and order *Tetrandria Monogynia.*

B. C.—Root perennial, long, succulent, horizontal; stems several, quadrangular, jointed, procumbent; leaves membranaceous; flowers small, yellow.

P. P.—Madder root is imported from the Levant; it is in long cylindrical pieces, about the thickness of a goose-quill, deep reddish-brown externally, reddish-yellow internally. It has a feeble, unpleasant odour, and a bitter, austere taste.

C. P.—There are no less than five colouring matters in madder, namely, purple, yellow, red, orange, and brown; consequently, it is much employed in the arts for dyeing. Any medical virtue it possesses must depend on a small quantity of bitter extractive it contains. It imparts its odour and taste to water, alcohol, and ether.

Th. E.—Madder has fallen into complete disuse, so much so that it has been expunged from the last editions of the *Lond.* and *Edin.* Pharmacopœias. Taken internally for any length of time, the various secretions, and even the substance of the bones, are coloured red. It was highly esteemed by Dr. Home as an emmenagogue; the dose of it is from ʒss. to ʒij., three or four times a day.

Ruta graveolens.—*Rue* (described in the division *Antispasmodics*) was formerly highly esteemed as an emmenagogue, and at present is a popular remedy as such; it is sometimes resorted to for the purpose of procuring abortion. Although it undoubtedly possesses a direct stimulating influence on the uterine organs, it is scarcely ever employed in regular practice in the present day for any of the purposes for which this class of remedies are administered.

Sabina, L. E. Juniperus sabina, folia, D. *Leaves* (*tops*, E. *—tops both fresh and dried*, L.) *of Juniperus sabina. Savin.*—A native of the South of Europe, cultivated in England; belonging to the natural family *Coniferæ*, and to the Linnæan class and order *Diœcia Monadelphia.*

B. C.—An evergreen, small, bushy shrub; leaves very small, ovate, pointed, densely imbricated; it flowers in April and May, and ripens its fruit, a dark purple *galbulus* or berry about the size of a currant, in autumn.

P. P.—As met with in the shops, savin consists of the young tops and their attached leaves; in the fresh state they are of a bright green colour, have a heavy, peculiar, terebinthinate odour, and a bitter, nauseous taste. When dry their colour is yellowish-green, and their odour much weaker.

C. P.—Savin tops consist of resin, volatile oil, gallic acid, extractive, &c. The medicinal properties are due to the volatile oil, *Oleum Sabinæ*, D. E., and which may be obtained by distillation with water, ℔ij. of the tops yielding ʒv. of oil; it is limpid and nearly colourless, having the odour of the plant, and a hot, acrid taste; its composition is $C^{10}H^8$, and its density 0·915. Savin com-

municates its odour and taste to water and to alcohol; the alcoholic tincture is of a bright-green colour.

Th. E.—Savin is a powerful stimulant to the uterine organs, and is employed as an emmenagogue with much benefit in amenorrhœa and chlorosis, depending on torpor or deficient action of the uterine system. In consequence, however, of its poisonous properties, it should be used with caution; its employment is contra-indicated where there is the least tendency to irritation or inflammation of the uterus, or any of the pelvic viscera. Savin is the drug usually resorted to by the vulgar for the purpose of producing abortion, but it cannot effect this, except at the risk of the life of the mother.

D. & M. of Adm.—In powder, a bad form, the dose is from gr. v. to gr. xv. The dose of the oil is from min. ij. to min. vj.—*Infusum Sabinæ.* (Fresh savin tops, ʒi.; boiling water, fʒviij.; macerate for one hour in a covered vessel.) Dose, fʒss. to fʒj.

In cases of poisoning with savin, emetics should be first employed to remove the poison from the stomach; and afterward opiates and demulcents, to be followed by general antiphlogistic treatment.

CHAPTER XI.

EMOLLIENTS.

(Demulcents—Relaxants.)

Emollients may be defined substances which diminish the vital tone or cohesion of the solid tissues of the body, and thereby render them more lax and flexible; or which, by diminishing acrimony, protect the sensible surface of the body from the action of acrid matter. This division of medicinal agents has been stated by many to act merely mechanically, by lubricating and softening the parts to which they are applied, or by sheathing them from the action of matters which are capable of irritating them. But this explanation cannot possibly apply to those substances which, when introduced into the stomach, operate on remote parts of the body. Emollients, therefore, seem to act either directly on the part to which they are applied, or indirectly through the medium of the circulation. They are principally employed in the treatment of inflammations, either general or local, in painful ulcerations, in diseases of the urinary organs, and in poisoning with acrid substances; but in all those cases they are only used to alleviate symptoms. Of the non-medicinal substances employed as emollients, warm water is the most important, and the higher the temperature at which it can be applied without the actual production of pain, the greater will be its emollient power; for this reason, in the form of vapour it will be found productive of most advantage.

ADEPS SUILLUS, D. ADEPS, L. AXUNGIA, E. *Fat of Sus scrofa; Hog's lard; Axunge.—Sus scrofa*, the common hog, belongs to the class *Mammalia*, order *Pachydermata*. The fat is usually taken from about the loins, from the omentum and from the mesentery, melted and strained, to separate the membranes.

PREP.—Lard, as sold for general use, usually contains salt, which has been added to prevent it from becoming rancid; consequently, to prepare it for medical purposes, the following formula is given in the *Dublin Pharmacopœia: Adeps suillus præp.* "Melt fresh lard, cut into small pieces, with a gentle heat, and strain it by pressure through linen; the lard, prepared by those who sell it, and which is preserved with salt, is to be melted with twice its weight of water, frequently stirring the mixture, then set aside, and the lard separated when cold."

P. P.—Axunge is a white, solid, fatty matter, with a very faint odour, and a mild, sweetish taste.

C. P.—It is composed of 38 per cent. of *stearin* and *margarin*, and 62 of *olein* or *elaïne*. It melts at about 85° F. into a clear, transparent liquid, which, if water be present, is whitish or milky; exposed to the air, axunge undergoes a process of decay, becoming *rancid*, when it acquires a peculiar unpleasant odour and acid properties; in this state it is unfit for medical purposes.

TH. E.—Axunge is not used in medicine internally; its action on the body is nutritive and emollient. As an external agent, it is employed as a basis for ointments, cerates, and liniments.

ADEPS OVILLUS, D. SEVUM, L. E. *Fat of Ovis aries; Suet; Mutton suet.—Ovis aries*, the sheep, belongs to the class *Mammalia*, and order *Ruminantia*. The fat is selected from the neighbourhood of the kidneys, melted and strained, to separate the membranes. Mutton suet is nearly similar in physical and chemical properties to axunge, and is employed for the same purposes; it is sometimes preferred to axunge, in consequence of its greater consistence and higher melting point.—*Adeps ovillus præp.*, D., is prepared in the same way as prepared hog's lard.

ALTHÆA OFFICINALIS, FOLIA ET RADIX, D. L. E. *The leaves and root of Althæa officinalis; Common Marshmallow.*—An indigenous plant, belonging to the natural family *Malvaceæ*, and to the Linnæan class and order *Monadelphia Polyandria*.

B. C.—Stem two to three feet high, downy; leaves heart-shaped, exquisitely soft and pubescent; flowers on axillary stalks, large, pale rose colour.

P. P.—The roots are fusiform, from 12 to 18 inches along, about the thickness of the finger, yellowish externally, white and fibrous within; the odour is faintly nauseous, the taste sweet, and very mucilaginous. The leaves have a weaker odour, and a less mucilaginous taste.

C. P.—The roots consist of gum, uncrystallizable sugar, starch, yellow colouring matter, *asparigin*, albumen, &c. It yields its mucilaginous properties to water.

TH. E.—Marshmallow root is one of the most commonly employed emollients on the Continent, but is not much used in England. As an internal remedy, it is given in inflammation of the mu-

cous membranes, as in gonorrhœa, cystitis, nephritis, bronchitis, &c., either alone or as a vehicle for other medicines. Externally, the leaves are generally employed in the acute phlegmasiæ, in the form of decoction or cataplasm.

D. & M. OF ADM.—*Decoctum Althææ*, D. *Mistura Althææ*, E. (Dried root (and herb, D.) of Althæa officinalis, ʒiv.; raisins, freed of the seeds, ʒij.; boiling water, *by measure*, ℔vij. (Ov., E.); boil down to ℔v. (Oiij., E.); strain through linen or calico; and when the sediment has subsided, pour off the clear liquor for use.) Dose, fʒi. to fʒij. frequently repeated.—*Sirupus Althææ*, D. L. E. (Fresh althæa root, bruised (sliced, E.), ℔ss. (ʒviij., L. E.); pure sugar, ℔ij. (℔iiss., L. E.); water, *by measure*, ℔iv. (Oiv., L. E.); boil the water with the root down to one half (strain through calico, E.), and express the cooled liquor; set aside for 24 hours, that the dregs may subside; pour off the clear liquor, add the sugar, and boil down to a proper consistence.) This sirup does not keep well. The dose is from fʒss. to fʒi.

INCOMP.—Iodine, and tincture of the muriate of iron.

AMYGDALÆ AMARÆ; AMYGDALÆ DULCES, D. L. E. [and U. S. P.]. *Kernels of the two varieties of Amygdalus communis; Bitter almonds; and Sweet almonds.*—The almond-tree is a native of Syria and Barbary, but grows freely throughout the South of Europe; it belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Monogynia.*

B. C.—A small tree, with acuminate, serrulate leaves, petiolate; glands, on the petioles of the bitter almond variety, on the leaves of the sweet almond; flowers sessile, appearing before the leaves, white or rose-coloured; fruit, an ovoid drupe, leathery, marked with a longitudinal furrow, where it opens when ripe, containing a hard, rough shell (*putamen*), marked with pits or furrows, within which is the seed or kernel.

P. P.—Sweet almonds vary in size, from half an inch to above an inch in length, and are about three eighths of an inch in breadth; they are oblong, compressed, and pointed at one end; the *episperm* or outer covering is reddish brown, covered with a yellowish dust; the parenchyma or *episperm* is white, hard, and oleaginous, inodorous, having a sweet, bland taste. Bitter almonds are generally smaller; they are characterized by their bitter taste and peculiar odour when rubbed with water. Several sorts of sweet almonds are met with in commerce; the principal of these are Jordan and Valentia almonds; the former come from Malaga, and are the most esteemed; they are longer and more pointed than the latter, which are brought from Valentia. Bitter almonds are imported from Mogadore.

C. P.—Sweet almonds consist of fixed oil, emulsin, liquid sugar, gum, &c. In addition to these, the bitter almond contains a peculiar principle named *amygdalin*, which, when brought in contact with water, from a mutual reaction between it and the emulsin, generates an essential oil, which will be more particularly described hereafter. (See *Sedatives.*) The fixed oil, *Oleum Amygdalarum*, D. L., is an article of the Materia Medica in the latter pharmaco-

pœia; the former directs it to be prepared "by bruising fresh almonds in a mortar, and expressing without heat." For this purpose, either sweet or bitter almonds may be employed; the latter, as being cheaper, are generally used; 1 *cwt.* of almonds yields from 48 to 52 ℔s. of oil. It is a bland, pale yellow, inodorous, very liquid oil; lighter than water, its density being about ·920; it consists of 76 per cent. of *olëine*, and 24 of *margarine;* it requires six parts of boiling, or 25 of cold alcohol for its solution; but is very soluble in ether.

Th. E.—Sweet almonds are nutritive and emollient; they should be *blanched*, deprived of the husk or pellicle, before being used, as, from its acridity, it has been known to produce nausea and irritation of the stomach and bowels, in some instances followed by an eruption on the skin. In medicine, the preparations of the sweet almond are used as emollients, chiefly in inflammation of the genito-urinary mucous membrane, to lessen the acrimony of the urine, and with the same intention in calculous affections. The oil is seldom given internally; according to some, it possesses mildly laxative properties; externally it is used for frictions, and as an ingredient in some soaps.

D. & M. of Adm.—*Confectio* (*Conserva*, E.). *Amygdalarum*, D. L. E. (Sweet almonds, ℥viij.; powdered gum-arabic, ℥i.; pure sugar, ℥iv.; blanch the almonds, and beat them with the gum and sugar into a uniform pulpy mass. "This confection may be longer kept unchanged if the almonds, acacia, and sugar, separately powdered, are afterward mixed; then, whenever the confection is to be used, beat all the ingredients together until they are thoroughly incorporated," L.) This confection is only used for the preparation of the emulsion.—*Mistura Amygdalarum*, D. (Blanched sweet almonds, ℥iss.; bitter almonds, ℈ij.; pure sugar, ℥ss.; water, *by measure*, ℔iiss.; rub the almonds with the sugar, adding the water gradually, and strain.)—L. E. (Almond confection, ℥iiss. (℥ij., E.); water (distilled, L.), Oj. (Oij., E.); add the water to the confection gradually, triturating until they are mixed, and strain through linen. Or it may be prepared as follows, E.: "Sweet almonds, ℥j. or ʒij.; pure sugar, ʒv.; mucilage, f℥ss.; water, Oij.; blanch the almonds, beat them to a smooth pulp in an earthenware mortar, first with the sugar, then with the mucilage; add the water gradually, constantly stirring, and strain through linen or calico.") Generally employed as a vehicle for other medicines, in doses of f℥i. or f℥ij.; the few bitter almonds in the Dublin preparation give it an agreeable flavour. Acids and alcohol, and, of course, tinctures, are incompatible with almond emulsion.

Amylum, D. L. E. *Fecula of the seeds of Triticum hybernum*, D. L.—*of Triticum vulgare*, E. *Starch; Wheaten starch.*—The common wheat, *Triticum hybernum*, is a native of the country of the Baschkirs, and is cultivated throughout all Europe. It belongs to the natural family *Graminaceæ*, and to the Linnæan class and order *Triandria Digynia.*

B. C.—Culms simple, glaucous, jointed; leaves alternate, linear, smooth, of a glaucous-green colour; flowers glumaceous, at the extremity of the culm; seed (grain) ovoid, yellowish, with a longitudinal furrow.

P. U. & M. OF PREP.—The fecula or starch forms nearly 70 per cent. of wheaten flour. It is procured by steeping the flour in water for one or two weeks until it becomes sour, drawing off the supernatant liquor; washing the residuum with repeated portions of water on sieves, allowing the liquor which passes through to deposite the starch in large vats; and, finally, draining the deposited starch, and drying it in a stove.

P. P.—Starch usually occurs in the form of small, irregular, hexagonal prisms; it is white, pulverulent, unalterable in the air, crackling under the fingers when lightly pressed, inodorous and insipid. Viewed under the microscope, it is found to consist of various-sized transparent particles, rounded or angular, uneven on the surface.

C. P.—Starch is composed of an external tegument termed *Amylin*, and a contained mucilage named *Amidin*. Its ultimate analysis is $C^{7}H^{6}O^{6}$. Starch is insoluble in cold water, but may be suspended in it by trituration; it is also insoluble in alcohol and ether. In water near the boiling point it dissolves almost completely, and if sufficiently concentrated, forms with it an opaque jelly, which becomes more consistent as it cools. By roasting starch, it is rendered somewhat analogous to gum, and is then soluble in cold water. With a cooled decoction of starch, iodine forms a rich blue compound (*iodide of starch*), which varies in the intensity of the colour, as the iodine or starch predominates. It is only on the amidin that iodine acts, not altering the colour of the amylin, consequently it produces no effect on starch when merely moistened with water, requiring either trituration or heat to burst the tegumentary membrane. Amidin constitutes 995 or 996 thousands of starch, amylin only 4 or 5 parts in a thousand.

Adulterations.—Starch is often adulterated with sulphate of lime; it may be detected by incineration, the starch burning away and leaving the fixed sulphate. Its weight is often increased by the presence of superabundant moisture, which may be discovered by drying starch in a vapour-bath, and ascertaining the loss of weight, which should not be more than ten or twelve per cent.

TH. E.—Wheaten starch is employed in medicine, chiefly in the form of decoction, as an emollient enema in dysentery, diarrhœa, or other inflammatory affections of the abdominal viscera; it is also used as a vehicle for more active remedies, and for suspending drugs which are administered in the state of powder. Externally, starch in fine powder is applied to excoriated parts, and for preventing the formation of bed sores.

D. & M. OF ADM.—*Mucilago* (*Decoctum*, L.) *Amyli*, D. L. E. (Starch, ʒvj. (ʒiv., L. E.); water, *by measure*, ℔j. (Oj., L. E.); triturate the starch with the water gradually added, and boil for a short time.)

AVENA, L. E. AVENA SATIVA, FARINA EX SEMINIBUS, D. *The seeds* (*freed from the husks*, L.) *of Avena sativa*, L. E. *Oatmeal*, D.—*Avena sativa*, the common oat, is generally cultivated throughout the whole of Europe; it belongs to the natural family *Gramineæ*, and to the Læinnan class and order *Triandria Digynia*.

B. C.—Root annual; culm from two to three feet high; leaves linear, acute; flowers glumaceous, disposed in loose, terminal, somewhat pendent panicles; seeds more or less elongated, pointed at both extremities, convex at one side, marked with a longitudinal furrow on the other, white, in some varieties black.

P. U. & M. of Prep.—Oats deprived of their husk are called *groats*, which, when coarsely ground, constitute *oatmeal*; the husks, with some adhering starch from the seeds, are sold under the name of *seeds*. Those different preparations are too well known to need description.

C. P.—Oats consist of 66 per cent. of meal, and 34 per cent. of husk or *Bran*. The dried meal consists of starch, mucilage, sugar, albumen, and lignin; but no gluten. Oatmeal or groats boiled with water, in the proportion of about ʒiij. to Oiij. of water, down to one half, constitutes *gruel*, a light article of diet for the sick or convalescent. If a larger proportion of the coarsely-ground meal be used, and unstrained, it is called *porridge*, a principal article in the dietaries of hospitals and charitable institutions, and forming a staple article of food in Scotland and the north of Ireland.

Th. E.—Oatmeal is nutritive and emollient; it is only employed in medicine internally, in the form of *gruel*, above referred to. Externally it is sometimes used in the form of poultice, prepared as *porridge*, but with less boiling; it enters into the composition of the *Cataplasma simplex*, D. (See page 192.)

Cera, L. Cera flava, D. E. *A concrete prepared by Apis Mellifica*, L. *Waxy secretion of Apis Mellifica*, E. *Bees' wax.*

Cera alba, D. L. E. *White wax; Bleached bees' wax.*—Wax is a product of many vegetables; but the wax employed in medicine is a secretion of certain glands, *wax pockets*, situated on the abdomen of the common bee; it is used by the insect for constructing the cells of the honeycomb.

Prep.—It is obtained from the comb, after the honey has been removed by dripping and expression, by melting it in water and straining so as to free it from impurities; in this state it constitutes yellow wax. White wax is procured from this by melting and agitating with water, and, finally, bleaching in thin ribands in the open air, the process being repeated until it loses all colour and odour.

P. P.—*Yellow wax* is in large cakes, of the shape of the mould in which it has been allowed to cool; it has a gamboge-yellow colour, a dull lustre, a peculiar sweet odour, and a faint, greasy taste; sp. gr., ·960 to ·965. *White wax* is in white cakes, with a faint yellow tinge; it is feebly translucent, inodorous, and insipid; sp. gr., about ·966.

C. P.—White wax consists of two substances, *cerine* and *myricine* (John); its ultimate analysis is $C^{20}H^{20}O$ (Hess). It is insoluble in water, and in alcohol and ether when cold; but is soluble in boiling alcohol and ether, in the fixed oils, and in oil of turpentine. It fuses at 155°, and is inflammable, burning without any residuum when pure. It combines with fats and resins when heated with them.

Adulterations.—Wax is adulterated: with starch, which may be detected by the action of tincture of iodine on cooled water in which it has been boiled; with resin, which may be dissolved out by alcohol; with fat or grease, which emit a peculiar odour when

burned; and with flour of sulphur and other earthy or metallic substances, which are left when wax is dissolved by oil of turpentine.

Th. E.—Wax acts as an emollient, and was formerly employed as such in ulcerations of the intestines, but at present it is not used as an internal remedy. As an external agent, it forms the basis of all cerates, and is an important constituent of many ointments and plasters.

Pharm. Prep.—*Unguentum Ceræ albæ*, D. (White wax, ℔j.; prepared hog's lard, ʒiv.; make into an ointment.)—*Ceratum*, L. *Ceratum simplex*, E. (Olive oil, fʒiv. (6 parts, E.); white wax, ʒiv. (3 parts, E.); (spermaceti, 1 part, E.); "add the oil to the melted wax and mix them," L.; "heat the oil gently, add the wax and spermaceti, stir the whole briskly when it is fluid, and continue the agitation as it cools," E.) Those preparations commonly known as *simple cerate* are used as mild and cooling dressings.—*Unguentum Ceræ flavæ*, D. (Prepared in the same manner as white wax ointment, substituting yellow wax.)—*Emplastrum Ceræ*, L. *Emplastrum simplex*, E. (Wax, ℔iij. (ʒiv., E.); suet, ℔iij. (ʒij., E.); resin, ℔j. (ʒij., E.); "melt together, and strain," L.; "melt with a gentle heat, and stir briskly till it concretes on cooling," E.) Chiefly used for preparing cantharides plaster.—*Linimentum simplex*, E. (Olive oil, 4 parts; white wax, 1 part; dissolve the wax in the oil with a gentle heat, and stir well, as the fused mass cools and concretes.) An emollient liniment.

Cetaceum, D. L. E. *Spermaceti. A concrete found in peculiar cells of the head of Physeter Macrocephalus*, L. *Cetin of Physeter Macrocephalus, nearly pure*, E.—*Physeter Macrocephalus*, the great-headed cachalot, is a gregarious whale, inhabiting the Pacific Ocean and the Indian and Chinese Seas; it belongs to the class *Mammalia*, order *Cetacea*.

Prep.—Although spermaceti is found in various parts of the body of the animal mixed with the common fat, it is chiefly obtained from a large, triangular-shaped reservoir, existing in the head over the surface of the upper jaws, in which it is contained dissolved in oil, forming a milky-looking, oleaginous fluid. It is separated from the oil by boiling in water, from which the spermaceti crystallizes as it cools; it is then purified by being remelted in a weak solution of potash, and the impurities skimmed off, and, finally, melted a third time by the agency of steam, and cooled slowly in tin moulds.

P. P.—Spermaceti occurs in various-sized crystalline masses, beautifully white, which are formed of an infinite number of small brilliant scales; it is soft and unctuous to the touch, inodorous, and insipid. Sp. gr., ·943.

C. P.—It is composed of 2 atoms of *margaric acid*, 1 of *oleic acid*, 3 of *cetene*, and 3 of water. It may be readily pulverized by the addition of a few drops of alcohol, or of almond oil; it is fusible at 112°, combustible, insoluble in water, and only slightly soluble in alcohol, even at a boiling temperature; it combines with fixed or volatile oils, and with melted fats.

Th. E.—Spermaceti is an emollient and demulcent, but at present is not used internally. Externally, it is employed as an ingredient in various cerates and ointments.

Pharm. Prep.—*Unguentum Cetacei*, D.—*Ceratum Cetacei*, L. (White wax, ℔ss. (ʒviij., L.); spermaceti, ℔j. (ʒij., L.); (prepared hog's lard, ℔iij., D.; olive oil, Oj., L.); melt with a gentle heat, and stir them with a spatula until cool.) An emollient and cooling dressing for raw or blistered surfaces.—*Unguentum Cetacei*, L. (Spermaceti, ʒvi.; white wax, ʒij.; olive oil, fʒiij.; being melted together with a slow fire, stir constantly till they become cold.) Similar to the last, but a softer preparation.

Cydonia, L. *Quince seeds; the seeds of Cydonia vulgaris.*—The quince-tree is a native of the South of Europe, belonging to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Pentagynia.*

B. C.—A small, much-branched tree; leaves ovate, obtuse, their under surface tomentose; flowers large, solitary or few, pale rose colour; fruit, a variously-shaped pome, yellow, austere, but very fragrant, containing many seeds.

P. P.—Quince seeds are ovate, pointed, plano-convex, of a reddish-brown colour, inodorous, leaving a bitter impression on the palate when chewed for some time.

C. P.—The episperm of the seed contains a large quantity of mucilage, named by Pereira *Cydonin.* The substance of the seed contains, besides other matters, emulsin and fixed oil, consequently emitting, when moistened, the bitter almond odour. The mucilaginous principle is dissolved out by boiling water.

Th. E.—Quince seeds are only employed in medicine for the mucilage which they contain; the decoction has been recommended as an emollient application to erysipelatous surfaces, and to aphthous ulcerations of the mouth.

Pharm. Prep.—*Decoctum Cydoniæ*, L. (Quince seeds, ʒij.; distilled water, Oj.; boil for ten minutes over a slow fire, and strain.) Never used internally. It does not keep well.

Imcomp.—Alcohol; acids; most metallic solutions; and tincture of galls.

Farina, D. L. E. *Flour of the seeds of Triticum hybernum*, D. L.—*of Triticum vulgare*, E. *Wheaten flour* (see *Amylum*).—Flour is employed in medicine for dusting excoriated or burned parts; in the form of bread, it is used as a basis for making pills; but as it always contains salt, it should not be employed for that purpose with substances which are decomposed by muriate of soda, as the salts of silver, &c.

Fici, L. E. Ficus carica, fructus siccatus, D. *Figs. The dried fruit of Ficus Carica.*—A native of Asia and the South of Europe, belonging to the natural family *Urticaceæ*, and to the Linnæan class and order *Polygamia Diœcia.*

B. C.—A small tree, with large, cordate, palmate leaves; flowers numerous, pedicellated, enclosed within a fleshy receptacle, which is umbilicated and nearly closed at the apex, hollow within; drupe or utricle one-seeded, sunk into the pulpy receptacle.

P. P.—Figs consist of the fleshy, pyriform receptacle, containing within numerous small, crustaceous seeds. When fully ripe they are dried in the sun, and packed in drums or baskets, in which forms they are imported; those in drums from Smyrna (*Turkey figs*), those in baskets from Spain and Portugal (*Portuguese figs*). Dried figs are too well known to require description.

C. P.—Dried figs consist of 62 per cent. of *sugar of figs*, with gum, fatty matter, extractive, and salts. They yield their sugar and gum to boiling water.

Th. E.—Figs are nutritive and emollient, and in large quantity

gently laxative; they are more employed as an article of the table than in medicine. They enter into the composition of the *compound decoction of barley*, and the *confection or electuary of senna*. Roasted figs are applied to gum boils, to promote suppuration.

Glycirrhiza glabra, D. L. E. *The* (*fresh*, L.) *root* (*and extract*, E.) *of Glycirrhiza glabra. Liquorice.*—A native of the South of Europe, now cultivated extensively in England; belonging to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Decandria.*

B. C.—Root long, creeping, succulent; stem erect, smooth, 4 to 5 feet high; leaflets ovate, retuse, yellowish; flowers axillary, racemose, papilionaceous, bluish or purplish.

P. U. & M. of Prep.—The root; it is dug up in November, when the plant is three years old, washed, and the small fibres cut off; it is imported in large quantities from Spain and Portugal, but that grown in England is most esteemed. It may be kept fresh for many months by covering it with sand in a damp cellar.

P. P.—Liquorice root is in cylindrical pieces, from one to two or three feet long, smooth and plump when fresh, wrinkled in the dry state, about the thickness of the little finger, externally of an umber-brown colour, internally yellow; it has a faint earthy odour, and a sweet, mucilaginous, subacrid taste.

C. P.—It consists of a peculiar saccharine principle named *glycirrhizine*, albumen, fecula, *asparigin*, or a principle analogous to it, some salts, and a thick, acrid, resinous oil. It yields its active principles to boiling water, but as the acrid oil is dissolved out by the aid of heat, the Edinburgh College directs cold water to be used for preparing the extract.

Th. E.—Liquorice root is emollient and demulcent; it is chiefly employed in the form of extract or decoction in catarrhal affections; it is also used to give flavour to other medicines. Liquorice powder is employed in pharmacy as a covering for pills, or to give them consistence.

D. & M. of Adm.—*Extractum Glycirrhizæ*, D. L. E. ("Prepared as the simple extracts," D.—"As extract of gentian," L. "Cut liquorice root into small chips, dry it thoroughly with a gentle heat, reduce it to a moderately fine powder, and proceed as for extract of gentian," E.) Extract of liquorice is imported in large quantities from Italy and Spain in the form of flattened rolls, about five or six inches long, an inch in breadth, and half an inch in thickness, enveloped in bay leaves; in this state it generally contains a large quantity of copper, acquired from the boilers in which it is prepared; it is therefore generally purified by dissolving in boiling water and inspissating; it then forms *stick* or *refined liquorice.* It is used as an emollient in coughs and bronchial affections, being allowed to dissolve slowly in the mouth.—*Decoctum Glycirrhizæ*, D. (Liquorice root, bruised, ℥iss.; water, *by measure*, ℔j.; boil for ten minutes, and strain.) Chiefly used as a vehicle for more active medicines.—*Trochisci Glycirrhizæ*, E. (Extract of liquorice and gum-arabic, of each, ʒvj.; pure sugar, ℔j.; dissolve them in a sufficiency of boiling water, and then concen-

trate the solution over the vapour-bath to a proper consistence for making lozenges.) For allaying tickling cough caused by irritation of the fauces.

Gossypium, E. *Raw Cotton. Hairs attached to the seeds of Gossypium herbaceum.*—A native of Asia, cultivated in America; belonging to the natural family *Malvaceæ*, and to the Linnæan class and order *Monadelphia Polyandria.*

B. C.—Stem 2 to 3 feet high; leaves hoary, palmate, acutely lobed; flowers yellow, with a large purple spot at the base of each petal; capsules ovate, pointed, about the size of a walnut; seeds numerous, imbedded in down, which constitutes the cotton.

P. P.—Cotton is in filamentous masses; each filament, examined by the microscope, is a flattened tube twisted on itself; it is of a pale yellowish-white colour, tasteless, and destitute of smell.

C. P.—Cotton is a modification of *lignin;* it is highly combustible, and is completely insoluble in water, alcohol, ether, the fixed and volatile oils, and all the vegetable acids.

Th. E.—The only medicinal use made of cotton is in the treatment of burns; it is applied in all stages, but the earlier the better; if any blisters be present, they should be first opened. The most convenient form for its application is that which is technically known as *French wadding*, and which is prepared for milliners; this should be applied in successive layers, the unstarched side next the burn, so as completely to exclude the air; it should not be removed for five or six days, if possible, and then only the outer layers. Some surgeons, in extensive burns, use a spirituous or turpentine wash before applying the cotton.

Gummi acaciæ, E. Acacia, L. [and U. S. P.]. Acacia Arabica et Acacia vera, gummi, D. *Gum of various species of Acacia*, E.—*of Acacia vera*, L.—*of Acacia Arabica, and Acacia vera*, D. *Gum-arabic; Gum acacia.*—The species of the genus Acacia which yield gum are inhabitants of Arabia, Egypt, and Senegal; they belong to the natural family *Leguminosæ*, and to the Linnæan class and order *Polygamia Monœcia.*

B. C.—Small thorny trees; leaves pinnated; leaflets linear, 8 to 20 pairs; flowers capitate, small, yellow.

P. U. & M. of Prep.—Gum exudes from the trees either through natural fissures in the bark, or through artificial incisions made into it in the hot season of July and August; it flows in the form of a thick, viscid fluid, which concretes on the tree without losing its transparency; that which flows early in the season is gathered in December, and that which flows later, in March; the first gathering is considered the best.

P. P.—Several varieties of gum acacia are met with in commerce; the most commonly known are, *Turkey, or true Gum-arabic, Barbary Gum, Senegal Gum, East India Gum, and Cape Gum.* Gum-arabic occurs in tears or irregularly-shaped pieces, varing in size from a pea to that of a chestnut; it is transparent and brittle, but not readily reducible to fine powder; it has a vitreous fracture, and a pale reddish-yellow or pure white colour. It is inodorous, and has a weak mucilaginous taste. Its sp. gr. varies from

1·316 to 1·525. The most transparent and whitest tears are picked out, and sold as *picked gum*, or *gum of first quality*. The other varieties of gum do not differ essentially from gum-arabic; they are usually in larger-sized pieces, and of a darker colour; they are inferior in quality to gum-arabic, and should not be used for medical purposes.

C. P.—Gum-arabic consists of 79·4 per cent. of soluble gum (*arabin*), 17·6 of water, and 3 of ashes. Some of the inferior sorts of gum contain a large quantity of insoluble gum (*bassorin*). Its ultimate analysis is $C^{12}H^{11}O^{11}$. Gum is soluble in its own weight of cold or boiling water, forming a viscid solution (*mucilage*); it is also soluble in vegetable acids, but is insoluble in alcohol, ether and the fixed or volatile oils. By exposure to heat, the water it contains is driven off; but it cannot be fused. Its solution in water reddens litmus paper faintly.

Adulterations.—The finer qualities of gum-arabic are adulterated with the inferior, and these, again, with the other sorts; but the picked gum ought alone to be used in medicine.

Th. E.—Gum is nutritive, emollient, and demulcent. It is employed in inflammation of the mucous membranes, in gastric irritation, in acrid poisoning, &c. Its chief uses are as a vehicle for more active medicines, for suspending insoluble substances in water, and as a basis for pills in extemporaneous prescriptions. A strong solution has been recently proposed by Mr. Rhind, of Edinburgh, as an application to burns. (See *Edinburgh Medical and Surgical Journal*, vol. lviii., p. 428.)

D. & M. of Adm.—In substance or powder, ʒss. to ʒi., allowed to dissolve slowly in the mouth, in irritation of the fauces and in tickling cough.—*Mucilago Gummi Arabici*, D. (Gum-arabic, in coarse powder, ℥iv.; hot water, f℥iv.; digest, shaking frequently, that the gum may be dissolved; then strain through linen.)—*Mistura Acaciæ*, L. (Acacia, powdered, ℥x.; boiling water, Oj.; rub the gum with the water gradually poured in, and dissolve it.)—*Mucilago*, E. (Gum-arabic, ℥ix.; cold water, Oj.; mix, dissolve without heat, but with occasional stirring, and strain through linen or calico.) Mucilage made with cold water keeps best; the quantity of gum employed in the Dublin formula is too much by one half. The following proportions of mucilage are required to render different substances miscible with aqueous vehicles, according to the observations of Dr. Montgomery: "*Oils* require about three fourths of their weight, *balsams* and *spermaceti* equal parts, *resin* two parts, and *musk* five times its weight."—*Emulsio Arabica*, D. (Gum-arabic, in powder, ʒij.; sweet almonds, blanched; white sugar, of each, ℥ss.; water, *by measure*, ℔j.; dissolve the gum in the water made hot, and as soon as the mixture is cold, pour it gradually on the almonds, previously pounded with the sugar; rub them together till the liquor assumes the appearance of milk, and strain.)—*Mistura Acaciæ*, E. (Mucilage, f℥iij.; sweet almonds, ʒx.; pure sugar, ʒv.; water, Oij.; blanch the almonds, beat them to a smooth pulp in an earthenware or marble mortar, first with

the sugar, and then with the mucilage; add the water gradually, stirring constantly; strain through linen or calico.) Used for the same purposes as almond mixture (*which see*).—*Trochisci Acaciæ*, E. (Gum-arabic, ℥iv.; starch, ʒi.; pure sugar, ℔j.; mix, and pulverize them; and make into a proper mass with rose-water, for forming lozenges.) For cough, hoarseness, and irritation of the fauces.

[*Sirup Acaciæ*, *Sirop de Gomme* (*Sirup of Gum-arabic*).—Gum-arabic, 1 part; water, 1 part; simple sirup, 8 parts; dissolve the gum in the water without heat, strain, and add the solution to the sirup, boiling it to 29°. This officinal preparation is much employed in the United States.]

Incomp.—Alcohol, and, consequently, all tinctures; and the mineral acids.

Hemidesmus Indicus. *Scented or Indian sarsaparilla.*—The root of this plant has, within the last ten or twelve years, been employed in medicine in the British Isles, under the name of *Smilax aspera*. It is a native of the Indian Peninsula, and belongs to the natural family *Asclepiadaceæ*.

B. C.—Roots long, cylindrical; stems twining, woody, slender; leaves opposite, entire, glaucous, on short footstalks; flowers small, greenish-purple, in axillary racemes.

P. & C. P.—As usually met with, the roots are from 10 to 12 inches in length, and vary in thickness from that of a goose-quill to that of the little finger. They consist of a reddish-brown corrugated epidermis, a yellow inner bark from a line to a line and a half thick, and a paler-coloured woody centre or meditullium; the bark splits transversely into rings, between which the meditullium is seen. Indian sarsaparilla has a very agreeable odour, resembling that of the *Tonquin bean*, and a sweetish, mucilaginous taste. It has not been accurately analyzed, but Mr. Garden, of London, obtained from it a volatile, crystallizable acid, which he has named *smilasperic* (*hemidesmic?* Pereira) *acid*, and on which its fragrant odour depends. It imparts both odour and taste to boiling water.

Th. E.—Although this root is highly esteemed in India as a diaphoretic and tonic, and is used there extensively as a substitute for sarsaparilla, it has been only employed in England for preparing a demulcent sirup, which, chiefly in consequence of its agreeable flavour, is employed as a vehicle for more active medicines. The sirup is prepared by infusing ℔ss. of the bruised root in Oj. of boiling water for 4 hours, straining, and adding ℔iij. of sugar. It may be given in doses of fʒi. or fʒij.

Hordeum, L. E. Hordeum, distichon, semina decorticata, D. *The seeds of Hordeum distichon freed from the husks. Pearl barley.*—A native of Tartary, now cultivated extensively in Europe; belonging to the natural family *Graminaceæ*, and to the Linnæan class and order *Triandria Digynia*.

B. C.—Stem 3 to 4 feet high, glaucous, furrowed; leaves alternate, lanceolate, acute; flowers terminal, in close spikes, with long serrated awns.

PREP.—Pearl barley is prepared in a mill of a peculiar construction, by which, after it has been deprived of its husk, it is rounded and polished.

P. P.—It is in small, spherical grains, white, smooth, still retaining a trace of the longitudinal furrow of the seed; it is odourless, but has a mild, sweetish, mucilaginous taste.

C. P.—Pearl barley is composed of fecula, uncrystallizable sugar, gum, gluten, albumen, lignin, &c. Proust has indicated the presence of a peculiar principle in barley-meal, which he has named *hordeïn*, but Dr. Thomas Thompson states that it is merely a variety of *amylin*. Pearl barley yields its mucilaginous principles to boiling water; the decoction contains much starch, as shown by the action of iodine on it when cool.

TH. E.—Pearl barley is employed in medicine in the form of decoction, as an emollient and demulcent drink in febrile and inflammatory affections, as a vehicle for other remedies, and to give bulk to enemata.

D. & M. OF ADM.—*Decoctum Hordei*, D. L. (Pearl barley, ʒij. (ʒiiss., L.); water, *by measure*, ℔vss. (Oivss., L.); first clean the barley with cold water; then boil for a short time with ℔ss. (Oss., L.) of the water; throw away the liquor; pour the remainder of the water boiling on the barley; and, finally, boil down to one half, and strain.)—*Decoctum Hordei comp.*, D. L. (Decoction of barley, *by measure*, ℔iv. (Oij., L.); raisins (stoned, D.); figs, sliced, of each, ʒij. (ʒiiss., L.); liquorice root, sliced and bruised, ʒss. (ʒiv., L.); "during the boiling, add the raisins first, then the figs, and, lastly, the liquorice, a little before the conclusion of the boiling; which is completed when there remains only what will afford ℔ij. *by measure* of strained liquor," D. "Add a pint of water, boil down to Oij., and strain," L.)—*Mistura Hordei*, E. (Pearl barley; figs, sliced; and raisins, stoned, of each, ʒiiss.; liquorice root, sliced and bruised, ʒv.; water, Ovss.; clean the barley, if necessary, by washing it with cold water; boil it with Oivss. of the water down to Oij.; add the figs, raisins, and liquorice root with the rest of the water; boil down again to Oij.; then strain.) These decoctions may be employed indiscriminately for the purposes above stated.

LINUM USITATISSIMUM, SEMINA ET OLEUM, D. L. E. *Linseed. Oil expressed from the seeds; Linseed Oil.*—The common flax, *Linum usitatissimum*, is an indigenous plant, belonging to the natural family *Linaceæ*, and to the Linnæan class and order *Pentandria Pentagynia*.

B. C.—Stem a foot to a foot and a half high, slender, branched above; leaves distant; flowers large, purplish blue; capsule globular, ten-seeded.

P. U. & M. OF PREP.—The seeds are threshed out of the plant when fully ripe; and the oil is obtained from them by pressure, without heat.

P. P.—The seeds are ovate, pointed, about a line in length, smooth, and shining; they are reddish-brown externally, whitish within; they have an oily taste, but are inodorous. The oil is thick, of a wine-yellow colour, with a faint, disagreeable odour, and a mild, somewhat nauseous taste. Sp. gr., ·932. As met with in

commerce, it is expressed with the aid of heat, when the colour is rather deeper. The seeds yield about 20 per cent. of oil.

C. P.—The seeds consist of vegetable mucus, containing free acetic acid and some salts, extractive, starch, wax, soft resin, gum, albumen, yellow colouring matter, and fixed oil (*Meyer*). The mucilage exists in the tegument, the fixed oil in the nucleus. Linseed oil is composed of oleic and margaric acids, and glycerin; it dissolves in 5 times its weight of boiling alcohol, in 40 times its weight of cold alcohol, and in about one part and a half of ether. At a temperature of —17° it congeals into a solid yellow mass; exposed to the air, it concretes into a transparent varnish, and, consequently, is called in the arts *a drying oil.*

Th. E.—Linseed and its oil are emollient and demulcent. An infusion of the seeds is sometimes employed internally in dysentery and diarrhœa, and in bronchial affections; it is also used as an emollient enema. Externally, the seeds reduced to powder, *linseed-meal*, are employed to prepare poultices and cataplasms; the oil mixed with lime-water is used as an application to recent burns.

D. & M. of Adm.—*Infusum Lini comp.*, D. L. *Infusum Lini*, E. (Linseed (bruised, D. L.), ʒi. (ʒvj., L. E.); liquorice root, sliced, ʒss. (ʒij., L. E.); boiling water, *by measure*, ℔ij. (Oj., L. E.); digest for four hours (near the fire, L. E.) in a covered vessel, and strain "through linen or calico," E.) *Linseed Tea*, the best form for internal use; it may be sweetened with honey, which increases its emollient properties. Dose, fʒij. to fʒiv. — *Linimentum Calcis*, D. E. (Lime-water and linseed oil, of each, fʒiij.; mix, with brisk agitation.) *Carron oil*, an excellent application to recent scalds and burns.—*Pulvis pro Cataplasmate*, D. (Linseed, which remains after the expression of the oil, one part; oatmeal, two parts; mix.) Both the Dublin and Edinburgh Colleges erroneously direct linseed meal for poultices to be deprived of its oil by expression, as the powder of unpressed linseed is much more mucilaginous.—*Cataplasma simplex*, D. (Powder for a cataplasm, any quantity; boiling water, sufficient to form a tepid cataplasm, to be smeared over with olive oil.)—*Cataplasma Lini*, L. (Boiling water, Oj.; bruised linseed, sufficient to make it of a proper consistence.)

Incomp.—Preparations of lead and iron, and probably most metallic salts, are incompatible with infusion of linseed.

Malva, L. E. *Herb of Malva Sylvestris; Common Mallow.*—Indigenous, belonging to the natural family *Malvaceæ*, and to the Linnæan class and order *Monadelphia Polyandria.*

B. C.—Root perennial, tapering; stem two to five feet high, branched; leaves on long petioles, five to seven lobed; flowers large, three or four together, axillary, of a purplish rose colour.

P. U. & M. of Prep.—The entire herb; it should be gathered when in full flower.

P. &. C. P.—It is odourless and insipid; every part of the plant abounds in mucilage, which it yields to boiling water. An infusion of the fresh flowers is an excellent chemical test for acids and alkalies, being changed to red by the former, and to green by the latter.

Th. E.—A simple emollient: it is employed in the same cases as the other remedies of this class, but at present is not much used.

D. & M. of Adm.—*Decoctum Malvæ comp.*, L. (Mallow, dried, ʒi.; chamomile, dried, ʒss.; water, Oi.; boil for a quarter of an hour, and strain.) Dose, fʒiv. to fʒvj.; chiefly used for fomentations, and in enemas.

Maranta, L. E. *Fecula of the root stalk (of the tubers, E.) of Maranta arundinacea*, L. E.; *and of Maranta Indica*, E. *Arrow-root.—Maranta arundinacea* is a native of the West Indies; it is extensively cultivated in Jamaica; *M. Indica* is a native of the East Indies, and has been introduced into the *Ed. Ph.*, as it is supposed to yield some of the East Indian arrow-root. They belong to the natural family *Marantaceæ*, and to the Linnæan class and order *Monandria Monogynia*.

B. C.—The rhizome is white, tuberous, and jointed, running horizontally in the ground, sending down many tuberous rootlets (*stoles*), about the thickness of a quill, covered with scales; stem 2 to 3 feet high; leaves ovate, lanceolate, alternate, with long, leafy, hairy sheaths; flowers small, white.

P. U. & M. of Prep.—Arrow-root is the fecula of the *stoles*; it is procured from them when they are twelve months old; they are then dug up, cleansed, and reduced to a state of pulp in wooden mortars; the pulp is agitated with water, the fibres removed with the hand, the milky liquor passed through a fine hair-sieve, and allowed to settle, when it deposites the arrow-root, which is again washed with cold water, and finally dried in the sun.

P. P.—*West Indian Arrow-root*, which is the most prized, and which alone is officinal, is in the form of a very white powder, often aggregated into small, irregular masses, crackling between the fingers, inodorous and tasteless. Examined by the miscroscope, it is seen, like the other varieties of fecula, to consist of small elliptical grains, varying in size from a 2000th to a 750th of an inch in their longest diameter.

C. P.—Its composition is $C^6H^5O^5$. In all other respects it resembles wheaten starch, already described, but the jelly which it forms with boiling water is much more consistent; according to the observations of Hayne, with equal quantities of boiling water, the jelly formed by 9 parts of arrow-root is as firm as that formed by 14 of wheaten starch.

Adulterations.—A great many varieties of fecula, known in commerce as Brazilian arrow-root, East Indian arrow-root, &c., but especially that obtained from the potato, *potato starch*, are commonly sold for the true West Indian arrow-root. The fraud is best detected by the microscope; the grains of which the true arrow-root is composed being much more minute than those of any of the other varieties.

Th. E.—Arrow-root is rather an article of mild nutritious diet for the invalid than a medicine. It is particularly valuable in consequence of its emollient properties in diseases of the digestive organs; it is also an excellent nutriment for infants and young children.

D. & M. of Adm.—A tablespoonful is sufficient to form a stiff jelly with a pint of boiling water or milk; to prepare it for use, the arrow-root should be first blended with a small quantity of the

fluid, the remainder then added, care being taken that it is boiling, and the whole then gently heated for a few minutes; it is usually flavoured with lemon-peel, sugar, &c. Arrow-root milk and arrow-root gruel are made like the corresponding preparations of sago (*which see*). A fecula obtained from the root of the *Canna coccinea*, a native of the island of St. Kitts, has been recently introduced into Britain under the name of *Tous-les-mois*; it is fully equal to arrow-root as an article of diet, and is much cheaper.

Olivæ oleum.—*Olive Oil* (described in the division *Cathartics*) acts also as an emollient; internally, it is only employed as such in cases of irritant poisoning; as an external agent, it enters into the composition of emollient ointments, liniments, &c.—*Unguentum simplex*, E. (Olive oil, f℥vss.; white wax, ℥ij.; melt the wax in the oil, and stir the mixture briskly while it concretes in cooling.) A mild dressing.

Ovum, L. E. *The egg of Phasianus Gallus, the domestic fowl.*—*Phasianus Gallus* (Gallus domesticus, *Temminck*) belongs to the class *Aves*, order *Gallinæ*. Eggs are a mild and nutritious article of diet, and as such are frequently used in the sick-room. The white, or *albumen*, is employed as an antidote in poisoning with corrosive sublimate, or with the salts of copper; it is also useful in all cases of irritant poisoning. The yolk is employed in pharmacy for suspending camphor, oils, resins, &c., in aqueous vehicles.

Saccharum commune, E. Saccharum officinarum, Succus concretus non purificàtus, D. *Raw sugar; Muscovado.*

Succus concretus purificatus, D. Saccharum, L. Saccharum purum, E. *Pure sugar; White or refined sugar.*

Sirupus empyreumaticus, D. Sacchari fæx, L. E. *Molasses; Treacle.*—The sugar-cane, *Saccharum officinarum*, is extensively cultivated in both the East and West Indies; it belongs to the natural family *Graminaceæ*, and to the Linnæan class and order *Triandria Digynia.*

B. C.—Stem solid, juicy, from 6 to 12 feet high, coloured; leaves flat, in two rows, sheathing at the base; flowers triandrous, in a terminal panicle from 2 to 4 feet long, of a silver-gray colour, from the long, soft hairs that surround the flower.

Prep.—The canes, when ripe, are cut off close to the ground, and the juice expressed from them by pressure between rollers; milk of lime is immediately added to the liquor, and the mixture gently heated, to saturate any acid present, and to remove the herbaceous matter. The clear liquor is then drawn off, evaporated to a proper consistence in copper boilers, and allowed to cool in large wooden vessels, in which the impure sugar is deposited in coarse, brown grains; this constitutes *raw sugar*, or *muscovado*. The sirupy liquor, which does not crystallize, constitutes *molasses* or *treacle*. Raw sugar is refined in England; it is first dissolved in a small quantity of water by the aid of steam, heated for a short time with bullocks' blood, or with hydrate of alumina, which clarifies the sirup; it is then strained to remove the impurities, and filtered through a thick layer of animal charcoal; the clear liquor is next evaporated by steam heat in copper vessels placed in a partial vacuum, to a proper consistence, and poured into conical moulds; as soon as it becomes solid in the moulds, they are put to drain, and a solution of pure sirup, or a mixture of clay and water, poured over the base of each loaf, which, as it gradually percolates through the sugar, removes any impurities. These loaves constitute *loaf-sugar*, *refined sugar*, or *pure sugar*.

P. & C. P.—The physical properties of the different varieties of sugar are too well known to need description. The specific gravity of crystallized white sugar is 1·6065. It is permanent in the air; exposed to heat, it melts, becomes brown, and emits a peculiar odour; it is inflammable, burning with a white flame; it is soluble in two parts of water at 60°, and to any extent in boiling water; it is soluble in 80 parts of absolute alcohol at the boiling temperature, very slightly in the same when cold, and in about five parts of rectified spirit; it is much more soluble in proof spirit; it is wholly insoluble in ether, which precipitates it from its solutions. In the crystalline state, cane sugar is composed of $C^{12}H^{11}O^{11}$. Treacle consists principally of uncrystallizable sugar, gummy extractive, and a small quantity of water, which it retains with great tenacity.

Adulterations.—The inferior raw sugars frequently contain sand, which is left when the sugar is dissolved in water; white sugar is said to be adulterated with lime and gum; the former is detected by oxalic acid, the latter by diacetate of lead, producing white precipitates in a solution.

Th. E.—Sugar is highly nutritious, but as an article of diet it is rather employed for its agreeable sweetness. As a medicine it is emollient and demulcent, and as such is used in coughs, and in irritant poisoning. In pharmacy it is in very general use as a flavouring ingredient, and to give bulk and consistence to powders, pills, conserves, electuaries, lozenges, sirups, &c.—*Sirupus*, L. *Sirupus simplex*, D. E. (Pure sugar (in fine powder, D.), ℥xxix. (℔x., L. E.); water, *by measure*, ℔j. (Oiij., L. E.); "add the sugar to the water gradually, and digest with a medium heat in a close vessel, frequently agitating until it is dissolved; then pour it off from the dregs, if there be any," D.: "dissolve the sugar in the water with the aid of a gentle heat," L. E.) As a flavouring adjunct to mixtures, and to suspend insoluble substances in aqueous vehicles.

Sago, L. E. *Fecula of the pith of Sagus Rumphii*, L. *Farina from the interior of the trunk of various Palmaceæ and species of Cycas*, E. *Sago.*—Three species of the palm tribe have been ascertained as sources of the sago of commerce, namely, *Sagus Rumphii*, *Sagus lævis*, and *Saguerus Rumphii*; the first inhabits Malacca and the Malay Islands; the second, Sumatra, Borneo, and the neighbouring islands; and the third, the islands eastward to the Bay of Bengal. They are all lofty trees, belonging to the natural family *Palmaceæ*, and to the Linnæan class and order *Monœcia Hexandria.*

Prep.—The tree being cut down, the pith is removed, reduced to powder, and the fecula separated from the woody fibre by repeated washings with water over a hair-sieve; when the milky liquor which passes through is allowed to settle, it deposites the sago in the form of a fine powder, which is afterward granulated by a process with which we are not acquainted.

P. P.—Sago occurs in the form of a fine powder (*Sago meal*), or in pearly grains (*Pearl Sago*); both sorts have a pinkish-yellow tint, a faint musty odour, but no taste. The grains of pearl sago

vary in size from a pin's head to that of a pea; the small variety is most esteemed; the larger sort is known as *common* or *brown sago.*

C. P.—In its chemical properties, sago resembles the other varieties of starch; as seen under the microscope, its globules are larger than those of arrow-root, but smaller than those of potato starch.

Th. E.—As an article of diet for the sick-room, sago is much inferior to arrow-root or tapioca, consequently it is not much used in the present day. The jelly may be prepared with it in the same manner as with arrow-root.—*Sago milk*, Thomson. (Sago, ʒi.; cold water, Oj.; soak the sago in the water for an hour, pour off the water, and add of new milk, Oss.; and boil slowly until it is well incorporated.) It may be flavoured with sugar, nutmeg, or cinnamon, or white wine, according to circumstances.—*Sago pudding*, Thomson. (Beat the yolks of two eggs and half an ounce of sugar together, and stir the mixture into a pint of sago milk.)

Salep.—This fecula is prepared from the roots of several species of the genus Orchis; among others, it may be procured from the *Orchis mascula* and *O. latifolia*, both of which are indigenous; the process for obtaining it is similar to that for obtaining arrow-root, and it is used as a substitute for that substance.

Sambucus nigra.—The flowers or the leaves of the common elder (described in the division *Cathartics*) are used to prepare an emollient cooling ointment.—*Unguentum Sambuci*, D. (Fresh elder leaves, ℔iij.; prepared hog's lard, ℔iv.; prepared mutton suet, ℔ij.; make an ointment in the same manner as the savine ointment.)—L. (Elder flowers and lard, of each, ℔ij.; boil the elder flowers in the lard till they become crisp, and press through a linen cloth.) The latter ointment, as having an agreeable perfume, should be preferred.

Tapioca, E. *Fecula of the root of Janipha Manihot. Tapioca.*—A native of Brazil, belonging to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—Root large, thick, juicy; stem about 6 feet high, shrubby; leaves palmate, 5 to 7 parted; flowers axillary, racemose.

Prep.—The root, which consists of woody fibre, a bland fecula, and a highly acrid, poisonous, milky juice, is reduced to a pulpy mass, washed and pressed on mat-sieves; the milky liquor, with the fecula suspended in it, passes through, and on settling deposites the fecula, which is repeatedly washed with water to free it from the poisonous juice; and, finally, dried on hot plates.

P. P.—Tapioca occurs in irregularly-shaped, rugged fragments, about the size of a small nut; white, with a pinkish hue, inodorous and tasteless. Like the other feculas, as seen under the microscope, it consists of small globules very uniform in size, and being nearly as small as the smallest globules of arrow-root.

C. P.—It is similar to the other varieties of fecula, and is a very fine form of starch.

Th. E.—Precisely similar to those of arrow-root; a jelly may be

prepared in the same manner. Tapioca milk and Tapioca pudding are made in the same way as sago milk and sago pudding.

TRAGACANTHA, L. E. TRAGACANTHA GUMMI, D. *Gummy exudation from Astragalus verus*, L.; *and other species*, E.; *Gum of Astragalus creticus*, D.—Several species of the genus Astragalus yield gum-tragacanth; they are natives of Asia Minor, Persia, and of the island of Crete. They are placed in the natural family *Leguminosæ*, and in the Linnæan class and order *Diadelphia Decandria*.

B. C.—The Astragalus verus, which yields the finest gum-tragacanth of English commerce, is a small shrub, from 3 to 4 feet high, with spiny branches, pinnatifid leaves, and yellow papilionaceous flowers.

PREP.—Tragacanth flows from natural fissures in the bark, and concretes rapidly when exposed to the air; it flows only during the hot season and in the night time.

P. P.—Gum-tragacanth occurs in broad, thin plates, of a white or citron-yellow colour, semitransparent, marked with concentric elevations. It is inodorous and tasteless, is hard and brittle, but with difficulty reduced to powder, unless heated to 100° or 120° F.

C. P.—It is composed of 57 per cent. of soluble gum (*adragantine* or *arabin*), and 43 per cent. of gum insoluble in cold, but soluble in boiling water (*bassorin*), (Bucholz). Its ultimate analysis is $C^{10}H^{10}O^{10}$. Gum-tragacanth forms a thicker mucilage with water than gum-arabic, "one part giving more viscosity to water than 25 parts of gum-arabic" (Bucholz).

TH. E.—Similar to those of gum-arabic, but not so generally employed.

D. & M. OF ADM.—Powder, ʒss. to ʒij.—*Pulvis Tragacanthæ comp.*, L. E. (Tragacanth, bruised; gum-arabic, bruised; and starch, of each, ʒiss.; pure sugar, ʒiij.; reduce the starch and sugar together to powder, add the tragacanth and gum-arabic, and pulverize the mixture thoroughly.) Generally used for administering calomel and other active and heavy powders to children; the dose, as an emollient for adults, is ʒi. to ʒij.—*Mucilago Gummi Tragacanthæ*, D. E. (Tragacanth, powdered, ʒij.; (boiling, E.) water, fʒviij. (fʒix., E.); macerate in a close vessel until the gum is dissolved (for 24 hours, and triturate to dissolve the gum, E.), and strain through linen.) Used for the same purpose as mucilage of gum-arabic.

TUSSILAGO FARFARA, D. L. *The flowers and leaves*, D.; *whole herb*, L., *of Tussilago farfara; Coltsfoot.*—Indigenous, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua*.

B. C.—Root creeping; leaves large, cordate, downy beneath; flowers asteraceous, yellow, appearing before the leaves.

P. & C. P.—The dried herb is odourless, but has a mucilaginous, slightly bitter taste. It is chiefly composed of mucilage and bitter extractive. It yields its properties to boiling water.

TH. E.—Although coltsfoot was formerly highly esteemed as an emollient and demulcent in chronic bronchitis and in consumption,

in the present day it is scarcely ever employed except in domestic practice. A decoction, prepared by boiling ʒiss. of the dried plant in Oiss. of water down to Oj., may be given in doses of fʒij. or fʒiij. repeatedly.

Uva, L. Uvæ passæ, E. Vitis vinifera, fructus siccatus, D. *The dried fruit of Vitis vinifera* (*with the stones taken out*, L.). *Raisins.*—The grape-vine is generally cultivated throughout the greater part of the globe; it belongs to the natural family *Vitaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—A hardy, climbing shrub; leaves alternate, smooth, lobed; flowers very small, greenish, in pendent racemes opposite to the leaves; fruit, a succulent, globose berry, usually 4-seeded.

Prep.—To prepare raisins, grapes are generally merely dried in the sun; sometimes artificial heat is employed; and in many places the fruit is dipped in alkaline ley before being dried.

P. P.—Raisins are too well known to require description; two sorts, widely different in appearance and flavour, are commonly met with: the common raisin (*Passulæ Majores*), which alone is officinal; and dried currants (*Passulæ Minores*), which are the product of a small variety of vine, an inhabitant of Greece, especially the neighbourhood of Corinth, and of the islands of Zante and Cephalonia.

C. P.—Raisins consist of uncrystallizable sugar (*grape sugar*), mucilage, extractive, bitartrate of potash, malic and citric acids, &c.

Th. E.—Raisins are emollient, nutritive, and demulcent; they are only employed in medicine as flavouring adjuncts, for which purpose they form ingredients in many officinal preparations.

Verbascum thapsus, folia, D. *The leaves of Verbascum thapsus. Great Mullein.*—An indigenous plant, belonging to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Mullein leaves, though still retained in the Dublin Pharmacopœia, are never used in the present day; they were formerly employed in the form of decoction as an emollient in chronic coughs. They are held by some to be feebly narcotic.

CHAPTER XII.

EPISPASTICS.

(Vesicants—Rubefacients—Counter-irritants—Derivatives—Revulsives.)

Epispastics are substances which produce redness, inflammation, or vesication, when applied to the skin. They are employed in the practice of medicine principally with the intention of relieving or removing the diseased condition of some internal organ, by

producing a new irritation or determination to the surface of the body, or to some remote part. Independently of this effect, however, blisters, which are the most important medicinal agents in this division, act also as general stimulants to the system, and as such, are frequently used with much benefit in the advanced stages of typhoid fevers, and in spasmodic affections arising from debility. This stimulant effect of blisters should be borne in mind, and, consequently, their application should be avoided in the very acute stages of inflammatory diseases, until the general excitement be previously subdued by antiphlogistic means. Epispastics are generally employed as *near the seat of the disease as possible*, unless when the intention is to produce a determination to some remote part of the body, as in the application of sinapisms to the feet in affections of the head.

[A single sentence in the foregoing paragraph has been *italicised*, for the purpose of expressing dissent. It is true that the author immediately qualifies it, by referring to the exception in the case of sinapisms to the feet in affections of the head. But in most examples of disease in which epispastics are applied, whatever other objects may be contemplated, one of the indications to be fulfilled by these agents is that of counter-irritation, derivative, revulsive, and hence they should be applied remote from the seat of disease. In the United States, most practical men concur in the opinion that blisters to the extremities are more serviceable in inflammations of the viscera of either of the great cavities of the body than when applied over the part affected. Especially is this the fact in phrenitis; for though in bad cases shaving the head for the application of ice is often resorted to, yet blisters, instead of being applied to the scalp, thus aggravating the disease, are judiciously placed upon the thighs, or upon the spine.

Blisters should be applied to children with great caution, never being suffered to remain upon infants longer than two or three hours. For want of this precaution, not only strangury may prove mischievous, but deep ulceration, and sloughing of the integument has often been fatal. A few grains of opium with camphor may be blended with the ointment before spreading it, when strangury is deprecated, as in certain inflammations of the bladder and adjacent structures.]

Ammoniæ causticæ aqua, D. Ammoniæ liquor fortior, L. Ammoniæ aqua fortior, E. *Stronger solution of Ammonia.*—(Those preparations have been described in the divisions *Antacids* and *Caustics*.) Applied to the surface of the body, the strong solution of ammonia produces redness and irritation, and if the application be long enough continued, it vesicates. Its only advantage as a blistering agent is that it operates speedily, on which account it is employed in inflammation suddenly attacking any of the abdominal viscera, as in retrocedent gout. In diseases of the urinary organs, it should be preferred as a blistering agent to cantharides, in consequence of the irritant action of that substance on the kid-

neys. As a counter-irritant, it is frequently used to relieve internal inflammations; and as a rubefacient, it is employed in muscular or neuralgic pains.—*Linimentum Ammoniæ*, D. L. E.—*Hartshorn and oil.* (Solution of ammonia (dens. 960, E.), f℥ij. (f℥j., L. E.); olive oil, f℥ij.; mix, with agitation.) An excellent counter-irritant, much employed in inflammatory sore throat, applied on a piece of flannel. By increasing the quantity of ammonia, it produces more powerful effects.—*Linimentum Camphoræ comp.*, D. L. (Camphor, ℥ij. (℥iiss., L.); solution of ammonia, f℥vj. (f℥viiss., L.); spirit of lavender, *by measure*, ℔j. (Oj., L.); mix the solution of ammonia with the spirit, then let a pint distil from a glass retort with a slow fire; lastly, dissolve the camphor in it.)—*Linimentum Ammoniæ comp.*, E. (Stronger aqua ammonia, dens. ·880, f℥v.; tincture of camphor, f℥ij.; spirit of rosemary, f℥i.; mix well together; it may be made weaker with f℥iij. of tincture of camphor and f℥ij. of spirit of rosemary.) Those preparations are used for the same purposes as the liniment of ammonia; they are cleaner, more agreeable, and equally efficacious.—*Linimentum Ammoniæ sesquicarbonatis*, L. (Solution of sesquicarbonate of ammonia, f℥i.; olive oil, f℥iij.; shake together until they are well mixed.) Its effects and uses are similar to those of *Linimentum Ammoniæ*.—*Ammoniacal caustic*, Gondret. (Mutton suet and olive oil, of each, 1 part; melt together with a gentle heat, and incorporate with two parts of strong solution of ammonia.) An excellent and prompt blister.

Antimonii et potassæ tartras.—*Tartar emetic* (described in the division *Diaphoretics*), applied by friction to the skin, produces a crop of pustules, which ulcerate and discharge purulent matter, causing thereby counter-irritant effects. With this intention, it is very frequently employed in various affections of the thoracic and abdominal viscera; in subacute inflammations of the brain or spinal cord and their membranes; in diseases of the joints; in muscular and neuralgic pains, &c. It is usually applied in the form of ointment or saturated solution; or from gr. v. to gr. x. may be sprinkled over the surface of any simple plaster, and left on until it produces the desired effect.—*Unguentum Tartari Emetici*, D. *Unguentum Antimonii Potassio-tartratis*, L. *Unguentum Antimoniale*, E. (Tartar emetic, in very fine powder, ℥i. (℥i., L. E.); prepared hog's lard, ℥i. (℥iv., L. E.).) The Dublin preparation is too weak, and, consequently, often fails to produce any effect. This ointment is employed by rubbing about half a drachm on the skin night and morning; in two or three days pustules begin to appear, when the application of the ointment should be discontinued, as it might give rise to troublesome ulceration. The concentrated solution is applied by means of pledgets of linen soaked in it; its operation is more speedy than that of the ointment.

Aqua fervens.—Boiling water has been used to produce rapid and extensive vesication, as a means of rousing the system in narcotic poisoning; the difficulty of confining its action, the great pain

caused by it, and the troublesome ulceration which it is apt to occasion, forbid its use except in extreme cases.

Artemisia Chinensis *et* A. Indica, D.—At the time of the publication of the Dublin Pharmacopœia, it was generally believed that the Chinese prepared moxas from the leaves of the above plants; but, according to Lindley, it is the leaves of another species, the *A. moxa*, that they employ for this purpose. The latter is a small shrub, a native of China, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua*.

Prep.—Moxas are prepared in China and Japan, from whence we have derived the use of them, by pounding the downy covering of the leaves until it resembles fine cotton, and rolling into small conical masses. In England they are prepared either from the pith of the stem of the *Helianthus annuus*, the common sunflower, or by soaking cotton-wool in a concentrated solution of nitre, and forming into small masses of the same shape as the Chinese moxas. More recently, Professor Osborne, of Dublin, has proposed the use of fresh-burned quicklime as a substitute for the common moxa (*Dublin Journal*, vol. xx., p. 409).

Effects and Uses.—The first sensation felt on the application of a moxa is rather agreeable, but it soon causes intolerable pain, which, however, does not last long. Redness and inflammation of the part to which it is applied are produced, and an eschar formed immediately under the spot on which it has been placed, which extends to a considerable depth if the moxa be kept long in contact with the skin. The eschar separates in from eight to ten days, the process of inflammation set up for its discharge being attended with more or less suppuration, according to circumstances; and a discharge of purulent matter may be established after the separation of the eschar by the application of irritating unguents or by the insertion of issue peas. Moxas differ from the actual cautery, in that their effects are produced more slowly, and that the inflammation caused by them penetrates more deeply. The principal diseases in which the application of moxas has been found beneficial are, in Pott's curvature of the spine, in inveterate sciatica, in neuralgia, in paraplegia, in chronic inflammation of the joints, in amaurosis, &c. The good effects produced by moxas depend on the principle of counter-irritation. Their use is contra-indicated in all acute inflammatory diseases.

Mode of Employment.—The apex is set on fire, and the base kept firmly applied to the skin by means of a piece of wire or a pair of forceps; the neighbouring parts should be covered with wet pieces of linen, to protect them from the sparks; the combustion may be quickened by the blowpipe or with the breath. Professor Osborne applies the quicklime moxa as follows: "Some quicklime in powder, to the depth of about half an inch, is placed on the skin inside a *porte moxa*, or a strip of card bent together and tied so as to form a circle; some water is dropped on and mixed with it. The ordinary lime from a limekiln answers well if fresh." Moxas should be applied as close to the seat of the disease as possible; Baron Larrey considers that their application to the following parts of the body is improper: to the head where the scull is

covered with skin and pericranium only; to the eyelids, nose, ears, larynx, trachea, sternum, glandular parts of the breast, linea alba, over the course of superficial tendons, articular prominences, where there is danger of injuring the articular capsules, and projecting points of bone. To these we may add, immediately over the course of large arteries, veins, or nerves.

Cantharides (described in the division *Diuretics*) are employed externally to produce rubefaction, vesication, or suppuration. The first of these effects is caused by the application of cantharides mixed with other substances to blunt their activity, as in the *Emplast. calefaciens*, D., or by applying the active preparations for only a short space of time. To produce rubefaction, we employ cantharides in the treatment of rheumatic and other local pains, in chronic catarrh, and in the habitual cough of the old and debilitated. When cantharides are left for some time closely applied to the surface of the skin, the cuticle is raised, and serous fluid effused between it and the true skin, a blister being thus produced in a period varying with the preparation of the flies which we employ. No agent is so generally used to produce vesication as cantharides, in consequence of the certainty of their operation, the comparatively little pain which they occasion, and the facility with which they may be applied. Blisters are employed in a great variety of diseases, generally with the intention of relieving pain, inflammation, and congestion of internal organs, which they effect by derivation to the surface of the body, or, as it is usually termed, by counter-irritation. With this view, they are applied in both the acute and chronic forms of inflammation of the brain and spinal cord, to the scalp, or along the track of the spinal marrow; in inflammatory affections of the thoracic and abdominal viscera, to the surface of the chest or abdomen; and in the local congestions of fevers, as near the affected part as possible. Blisters are also used to stimulate to increased action, as in indolent buboes, in chronic enlargement of the testicle, over chronic abscesses, to indolent ulcers, and in effusion into the joints. To excite the system generally, they are applied in the comatose stages of typhoid fever or pestilential cholera, and in apoplectic affections. To produce suppuration, cantharides are used in the form of ointment, as a dressing to parts from which the cuticle has been previously removed; and as powerful counter-irritants, are thus employed with much advantage in chronic inflammatory diseases, forming what is termed a perpetual blister. Cantharides should not be employed to produce vesication where any irritation or inflammation of the urinary organs is present, in consequence of their peculiar tendency to produce strangury. In infants and young children, blisters should be used with great caution, as they are liable to produce troublesome sloughing, which in many instances has caused death. As a general rule, they should only be left on until redness of the surface is produced, when the application of a warm poultice to the part will cause vesication.

Pharm. Prep.—Emplastrum Cantharidis, *Dub.* "Cantharides, in very fine pow-

der, yellow wax, of each, ℔j. ; yellow resin, ʒiv. ; mutton suet, hog's lard, of each, ℔ss. ; melt the wax, fats, and resin together ; and when they are just becoming stiff by cooling, sprinkle in the cantharides, and mix so as to form a plaster." *Lond.* "Cantharides, in very fine powder, ℔j. ; wax plaster, ℔iss. ; lard, ℔ss. ; sprinkle the cantharides in the plaster and lard melted together, and removed from the fire, a little before they concrete, and mix them all." *Edin.* "Cantharides, in very fine powder, wax, resin, and suet, of each, ʒij. ; liquefy the fats, remove from the heat, sprinkle in the cantharides, and stir briskly, as the mixture concretes on cooling." This is the preparation most generally employed to produce a blister ; it is spread on leather with a cold (*not heated*) spatula, and the margin covered with adhesive plaster, to prevent its moving or falling off. In order to prevent the irritant action of the cantharides on the urinary organs, in persons liable to such an effect, a piece of tissue paper oiled should be placed between the plaster and the skin. Blisters are usually left on from eight to twelve hours to produce their action ; the raised cuticle should be then cut to allow the escape of the serum, and a dressing of spermaceti or some simple ointment applied.—*Emplastrum Calefaciens*, D. (Plaster of cantharides, 1 part ; Burgundy pitch, 7 parts ; melt with a medium heat ; and mix so as to make a plaster.) Rubefacient ; its uses have been described above.—*Acetum Cantharidis*, L. E. ("Cantharides, in powder, ʒij. ; acetic acid, Oj. ; macerate for eight days, frequently shaking ; press, and strain," L. "Cantharides, in powder, ʒiij. ; acetic acid, fʒv. ; pyroligneous acid (dens. 1034), fʒxv. ; euphorbium, in coarse powder, ʒss. ; mix the acids, add the powders, macerate for 7 days, strain and express strongly, and filter the liquor," E.) Employed as an extemporaneous blister ; it may be conveniently applied with a piece of sponge ; it produces a blister in from 5 to 10 minutes ; complaints are frequently made of the inefficiency of this preparation ; this arises either from its being prepared with weak acid, or from its not being rubbed into the skin with sufficient care, as its application should be continued until it produces intense redness of the part, and much pain.—*Ceratum Cantharidis*, L. *Unguentum Cantharidis*, E. (Cantharides, in very fine powder, ʒi. ; spermaceti cerate (resinous ointment, E.), ʒvj. (ʒvij., E.) ; add the cantharides to the cerate (or ointment) softened by heat, and mix.) Used to promote suppuration from blistered surfaces, but it is very apt to cause strangury.—*Unguentum Cantharidis*, D. L. (Cantharides, in very fine powder, ʒij. (ʒi., L.) ; distilled water, *by measure*, ʒviij. (fʒiv., L.) ; ointment of white resin (cerate of resin, L.), ʒviij. (ʒiv., L.) ; boil down the water with the cantharides to half, and strain ; mix the cerate with the strained liquor, then evaporate to a proper consistence.)—*Unguentum Infusi Cantharidis*, E. (Cantharides, in moderately fine powder, resin, and wax, of each, ʒi. ; Venice turpentine and axunge, of each, ʒij. ; boiling water, fʒv. ; infuse the cantharides in the water for a night, squeeze strongly, filter the liquid, add the axunge, and boil till the water is dispersed ; add the wax and resin ; and when these have melted, remove the vessel from the fire, add the turpentine, and mix the whole thoroughly.) Used for the same purposes as the cerate, than which these preparations are somewhat milder.—*Emplastrum Cantharidis comp.*, E. (Venice turpentine, ʒivss. ; Burgundy pitch and cantharides, of each, ʒiij. ; wax, ʒi. ; verdigris, ʒss. ; white mustard seed and black pepper, of each, ʒij. ; melt the wax and Burgundy pitch, add the turpentine, and while the mixture is hot sprinkle into it the remaining articles, previously in fine powder, and mixed together ; stir the whole briskly, as it concretes in cooling.) A more certain blister than the simple *emplastrum cantharidis ;* according to Duncan, it is *infallible.—Blistering cloth*, P. (Oil of cantharides obtained by ether, 4 parts ; yellow wax, 8 parts ; melt with a gentle heat, and spread on waxed linen or calico.) A more elegant preparation than blistering plaster, and equally, if not more efficacious.—*Tela vesicatoria*, *Charta vesicatoria*, &c., so generally employed in the present day for blistering, are prepared in the same manner, paper being used instead of linen or calico.—*Papier d'Albespeyrres*, now so generally used for keeping up a discharge from blistered surfaces, are prepared as follows ; No. 1, which is the weakest : "White wax, 5 parts ; olive oil, 3 parts ; oil of chocolate, 4 parts ; spermaceti, 3 parts ; turpentine, 1 part ; cantharides, 1 part ; water, 8 parts ; all melted together." No. 2 : "White wax, 3¾ ; olive oil, 2¼ ; oil of chocolate, 3 ; spermaceti, 2¼ ; turpentine, ¾ ; cantharides, 1 ; water, 8." No. 3, the strongest, contains the same quantities of cantharides and water, and half the proportions of the other ingredients contained in No. 1. The compound is spread on paper, or on fine linen or calico.

CAPSICUM ANNUUM, CAPSULÆ CUM SEMINIBUS, D. CAPSICUM, L. E. *The fruit of Capsicum annuum, and of other species of Capsicum,*

E. *Capsicum, or Chillies. Cayenne pepper.*—The Capsicum annuum is a native of the East and West Indies, and of South America; it belongs to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—An herbaceous annual, 1 to 2 feet high; leaves ovate, smooth, placed on long footstalks in irregular order; flowers white, axillary, solitary; fruit, a long conical, juiceless, scarlet or yellow berry, pendulous.

P. U. & M. of Prep.—Cayenne pepper is prepared by reducing to a moderately fine powder the dried fruit of this and of other species. It is often imported in powder, chiefly from the West Indies, in small gourds; but the greater part is ground at home, a fourth part of common salt being generally mixed with it.

P. P.—A moderately fine powder, of a reddish-yellow colour, with a faint aromatic odour, and a bitter, acrid, burning taste.

C. P.—The active principles of Cayenne pepper depend on a very acrid oil, which has been named *Capsicin.* It yields its virtues to water, alcohol, ether, acetic acid, and the fixed and volatile oils.

Th. E.—Cayenne pepper applied to the skin produces redness and inflammation, which is followed by vesication, if the application be continued for some time. As a rubefacient, and even vesicant, it is much employed in the West Indies, but is scarcely ever used with either of those intentions in Great Britain; nevertheless, applied in the form of cataplasm, it is a convenient and effectual counter-irritant. Its use as a stimulant will be considered under that head.

Crotonis tiglii oleum, *Croton Oil* (described in the division *Cathartics*), rubbed on the skin, produces redness and inflammation of the part to which it is applied, which is followed by a copious pustular eruption. It is applicable to all cases in which we wish to produce speedy and active counter-irritation; but it should not be applied to the face or scalp, as in more than one instance I have seen it produce erysipelatous inflammation of those parts. To prepare a liniment of croton oil, one part may be rubbed up with seven of olive oil, a combination sufficiently powerful for general employment; in hospital or dispensary practice, linseed oil may be used instead of olive oil.

Euphorbia, L. E. Euphorbia Canariensis, gummi resini, D. *Gum-resin of Euphorbia officinarum*, L.—*of Euphorbia Canariensis*, D.—*Concrete resinous juice of undetermined species of Euphorbia*, E. *Euphorbium.*—The species of the genus Euphorbia, from which the gum-resin has been obtained, is not yet accurately ascertained; it is a native of the north of Africa. The genus belongs to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monandria.*

B. C.—The pieces of the branches which we find mixed with the gum are 4 to 5 angled, with dark, shining spines, double. The genus is characterized by its monœcious heads of flowers, surrounded by an involucrum of one leaf with five divisions, including several barren flowers, with one fertile; capsule 3-seeded.

Prep.—It is obtained in the neighbourhood of Mogadore (from whence it is brought to Great Britain), by making incisions into the stem and branches, from

which a milky juice exudes; this juice concretes on the tree into a yellow gum, and is gathered when quite dry. So intensely acrid is the gum, that those who gather it are obliged to tie a cloth over their mouth and nostrils.

P. P.—Euphorbium is in tears or small irregular masses, roundish and angular, somewhat friable; they are of a dull yellow colour, and pierced with small holes, formed by the spines of the branch on which they concrete. They have a weak odour, but a very acrid and burning taste; the powder snuffed into the nostrils produces much irritation, with incessant sneezing.

C. P.—It consists principally of resin, the active ingredient, with wax, some caoutchouc, and salts of lime and potash. The resin is soluble in alcohol, but water has no action on it. Euphorbium melts when exposed to heat, is inflammable, and burns with a bright flame, and a rather agreeable odour.

Th. E.—Applied to the surface of the skin, it causes much irritation, but does not vesicate or produce any eruption; if the cuticle, however, has been previously removed, its application causes a purulent discharge. It may, therefore, be employed with much advantage mixed with lard as an issue ointment, or for keeping up a discharge from blistered surfaces, being cheap and certain in its effects. For an issue ointment, 25 to 30 grains may be rubbed up with an ounce of lard, and the strength may be increased or diminished according to circumstances. It possesses the advantage over the preparations of cantharides, that it does not irritate the urinary organs; and over savine ointment, that it does not spoil by keeping. The facility with which we can increase or reduce its strength is also of great importance.

Ipecacuanha (described in the division *Emetics*) is an excellent counter-irritant; applied in the form of liniment, prepared as directed below, it produces an eruption of minute vesicles on an inflamed base in from 36 to 48 hours, which fade away in 3 or 4 days. It possesses the advantage of not causing much pain or constitutional irritation.—*Linimentum Ipecacuanhæ.* (Ipecacuanha, in very fine powder, ℥ss.; axunge, ʒij.; olive oil, f℥iss.; mix.) A fourth part of this should be well rubbed into the part we desire to irritate three or four times a day.

Mezereum. *Mezereon* (described in the division *Diaphoretics*).—The inner bark of the stem and branches is much employed on the Continent as a vesicatory, but as in the dry state its effects are uncertain, and slowly produced, it is not used in Great Britain as such. In France, in order to produce a blister with this substance, a piece of the bark is softened in warm water or in vinegar, and applied to the part with a compress and roller; at first the bark is renewed night and morning, but when the blister is produced it is only changed once daily. An issue ointment is also prepared with it, by digesting for 12 hours the sliced bark in axunge and white wax liquefied together, and straining.

Ranunculus acris, folia, D. Ranunculus flammula, herba recens, D. *The leaves of Ranunculus acris, and the fresh herb of Ranunculus flammula.*—Indigenous, belonging to the natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Polygynia.*

Several species of the genus Ranunculus possess vesicating properties in the recent state, but when dried they are completely inert. They were formerly used as epispastics, and although the two species above mentioned are still retained in the Dublin Pharmacopœia, they are never employed in the present day in regular practice.

Ruta graveolens (described in the division *Antispasmodics*).—The fresh leaves may be employed as a local stimulant and rubefacient.

Sabina.—*Savin* (described in the division *Emmenagogues*) acts as a powerful local irritant. It is very generally employed in the form of ointment or cerate for keeping up the discharge from a blistered surface, producing what is termed a *perpetual blister.* Owing, however, to the difficulty in preparing the ointment well, and to its losing its properties by long keeping, an ointment prepared with euphorbium (see page 204) should be preferred for that purpose.—*Unguentum Sabinæ*, D. *Ceratum Sabinæ*, L. E. (Savin (fresh, E.; fresh leaves stripped from their stalks, D.), bruised, ℔ss. (℔i., L.; 2 parts, E.); prepared lard, ℔ij. (4 parts, E.); bees' wax, ℔ss. (1 part, E.); "boil the leaves in the fat until they become crisp; strain with expression; then add the wax, and liquefy together," D. "Boil the savin in the lard and wax melted together (until the leaves become crisp, E.), and press through a linen (or calico, E.) cloth," L. E.) When well prepared, this ointment is of a fine green colour, and has the peculiar odour of savin well marked.

Setons and Issues are employed to produce derivation from some internal organ, by causing a discharge of pus from the surface of the body, as in deep-seated local inflammations; and to establish a drain from the system in many diseases. With the former intention, they are employed in ophthalmia, in chronic inflammation of the ear, in diseases of the brain and spinal marrow, in caries of the vertebræ, in chronic articular inflammation, in white swelling, in hip-joint disease, &c. With the latter, in apoplexy, epilepsy, chorea, spasmodic asthma, phthisis, hepatitis, &c. When setons or issues are employed in local affections, they should be applied as near the seat of the disease as practicable; but when used in general diseases, they may be inserted in whatever part of the body is most convenient; thus, setons may be inserted into the nape of the neck, and issues in the inside of the leg or arm. The introduction of a seton is easily effected with a seton needle, an instrument shaped like a lancet, about 3 inches long, $\frac{3}{8}$ of an inch

broad, slightly curved, and having an eye in the handle; a fold of the integuments being held up, the needle is forced through, and by its means a skein of silk, or a piece of India-rubber tape sufficient to fill the aperture, introduced through the wound; a fresh portion of the silk or India-rubber is drawn through the aperture daily, and if it does not produce sufficient irritation, it is smeared with some irritating ointment. Issues are more employed at present than setons; the manner in which they are inserted has been explained before (see page 137).

Sinapis.—*Mustard* (described in the division *Emetics*) applied to the surface of the body acts as a local irritant, producing inflammation attended with much pain, and if the application be long continued, vesication, with even ulceration and gangrene. It is very generally employed, in the form of cataplasm, or, as it is technically called, *sinapism*, to produce counter-irritation; applied to the soles of the feet or calves of the legs, in the low stage of typhus fever, especially when stupor or delirium is present, in apoplexy and coma, in narcotic poisoning, and in other cases in which there is determination to the head. It has also been applied to the chest in some pulmonary and cardiac diseases.—*Cataplasma Sinapis*, D. L. (Mustard seed and linseed, each powdered, ℔ss.; boiling vinegar, sufficient to make a cataplasm. "Which may be made more stimulating by adding ʒij. of scrapings of horse-radish root," D.) This is a bad form for preparing sinapisms, as vinegar lessens the activity of the mustard; a better plan is simply to mix common table mustard with lukewarm water, and spread on a piece of linen. Sinapisms produce inflammation in from fifteen to twenty minutes after they are applied; the length of time which they should be left on may be regulated by the feelings of the patient; but if he be insensible, they should be removed as soon as the skin is reddened.

Terebinthinæ oleum.—*Oil of Turpentine* (described in the division *Anthelmintics*) is a speedy and effectual rubefacient; when applied to the surface of the body, producing active inflammation, succeeded by a crop of small pimples, and sometimes minute blisters. If it be applied warm, it acts more quickly and more powerfully. As a counter-irritant, it is very generally and very beneficially employed in inflammatory attacks of the thoracic or abdominal viscera, in colic and peritonitis, in sore throat, in chronic rheumatism, in neuralgia, &c.—*Linimentum Terebinthinæ*, D. L. E. ("Ointment of white resin, ℔j.; oil of turpentine, ℔ss.; gradually mix the turpentine with the melted ointment," D. "Soft soap, ʒij.; camphor, ʒi.; oil of turpentine, fʒxvj.; shake them together until they are mixed," L. "Oil of turpentine, fʒv.; resinous ointment, ʒiv.; camphor, ʒss.; melt the ointment, and gradually mix with the oil and camphor till a uniform liniment be formed," E.) This liniment is powerfully stimulating; it was first proposed by Kentish as an immediate dressing for extensive burns, particularly when

the vital powers were sinking, and for this purpose it is employed with much advantage; the parts are first smeared with oil of turpentine, and pledgets of lint covered with this liniment are then applied. It is also used as a counter-irritant, applied with friction in rheumatic and neuralgic pains.—*St. John Long's Liniment.* (The yolk of one egg; oil of turpentine, fʒiss.; strong acetic acid, fʒi.; pure water, fʒiij.; first rub the yolk of egg, the water, and the acetic acid together, then add the oil of turpentine, and agitate the whole until they are well mixed.) This excellent counter-irritant liniment is applied by means of a sponge; its effects vary with the force which is used in rubbing, and with the length of time the application is continued.

CHAPTER XIII.

ERRHINES.

(Sternutatories—Ptarmics.)

Errhines are substances which, when applied to the lining membrane of the nostrils, cause an increased discharge of their natural secretion. Their medicinal employment is very limited, and in the present day they are seldom resorted to in regular practice. Their remediate powers depend on the derivation which they occasion from the surrounding or neighbouring parts, by the increased secretion from, and consequent afflux of blood to, the nasal membrane. Snuffed into the nostrils so as to occasion sneezing, they may be employed to excite respiration when this function is suspended, or to promote the expulsion of foreign bodies lodged in the air passages; their use for these purposes, however, is not unattended with danger.

Asarum Europæum, folia, D; Asarum, L. *Leaves of Asarum Europæum. Asarabacca.*—An indigenous plant, belonging to the natural family *Aristolochiàceæ*, and to the Linnæan class and order *Dodecandria Monogynia.*

B. C.—Stem very short; leaves, 2, reniform, petioled, shining; flowers solitary, from the axil of the two leaves, large, drooping, of a greenish-brown colour and coriaceous substance, upon a short footstalk.

P. P.—Although the leaves only are officinal, the whole plant is kept in the shops; it has a faint, spicy odour, and a bitter, very acrid taste. The root is the most active part of the plant.

C. P.—The only important constituent of the leaves is a peculiar principle which has been named *asarin;* the root contains also an odorous volatile oil, and a very acrid fixed oil.

Th. E.—Asarabacca was formerly employed as a cathartic and emetic; in the present day it is only used as an errhine, to produce

a discharge of mucus from the pituitary membrane in headache, in chronic ophthalmia, in coryza, &c.

M. of Adm.—Three or four grains of the powdered leaves may be sunffed up into the nostrils night and morning, or the same quantity of the following preparation may be used: *Pulvis Asari comp.*, D. (Asarabacca leaves, dried, ʒi.; lavender flowers, dried, ʒi.; reduce them together to powder.)

Euphorbium (described in the division *Epispastics*) operates as a powerful errhine, but its action is so violent, even when diluted with any bland powder, that in the present day it is scarcely ever employed as such.

Hydrargyri oxydum sulphuricum, D. *Subsulphate of mercury; Turbith mineral.*

P. P.—A dense, lemon-yellow powder; void of odour, but having a somewhat acrid, metallic taste.

C. P.—It is composed of one eq. of sulphate of mercury, and two of oxyde of mercury (Kane). It is permanent in the air; exposed to heat it acquires a reddish-brown colour, but on cooling it resumes its former yellow hue. It requires 2000 parts of cold or 600 of boiling water for its solution.

Prep.—"Persulphate of mercury, 1 part; warm water, 20 parts; triturate together in an earthenware mortar, and pour off the supernatant liquor; wash the yellow powder with warm distilled water, till the decanted fluid is no longer precipitated on the addition of a few drops of solution of caustic potash; lastly, dry the sulphuric oxyde of mercury which remains."

Th. E.—This preparation was formerly employed as an emetic, but is now only used as an errhine, to produce a discharge from the nostrils in chronic ophthalmia, incipient hydrocephalus, cephalalgia, &c. One grain mixed with four or five of some bland powder, as liquorice or starch, is snuffed up the nostrils at bedtime or in the morning.

Veratrum album, radix, D. Veratrum, L. E. *Root* (*Rhizome*, E.) *of Veratrum album. White hellebore.*—A native of the mountainous regions of Central and Southern Europe, belonging to the natural family *Melanthaceæ*, and to the Linnæan class and order *Polygamia Monœcia.*

B. C.—Rhizome fleshy, cylindrical, giving origin to numerous undivided radicles; stem 1 to 4 feet high; leaves sheathing, plaited, ovato-oblong; flowers greenish-yellow, in a large spreading panicle.

P. P.—As usually met with in the shops, white hellebore root consists of the rhizome with the radicles attached; it is in pieces of from two to three inches long, about the thickness of the little finger, covered with arough, dark-brown bark, grayish-white internally. In the fresh state, it has a strong, disagreeable smell, which is nearly lost by drying; but it retains the acrid, intensely bitter taste.

C. P.—It is composed of a fatty matter, yellow colouring matter, starch, gum, lignin, and an alkaloid, on which its acridity depends,

and which has been named *veratria* (see *Stimulants*), combined with gallic acid (*Pelletier* and *Caventou*). More recently Simon has announced the discovery of two new vegetable alkaloids in white hellebore root, one of which he has called *Jervin*, and the other *Barytin*. The acridity of the root is extracted both by water and by alcohol.

Th. E.—The local action of white hellebore root is powerfully irritant. Snuffed up the nostrils, it produces a copious flow of mucus, with much sneezing. It may be used as an errhine in the same cases as the other remedies of this class. Two or three grains of the root finely powdered, and mixed with ten or twelve grains of powdered liquorice root, orris root, or starch, may be employed every evening. It enters into the composition of most cephalic snuffs.

[Some of them contain also a proportion of the powder of *Sanguinaria Canadensis*, and are said to be useful in polypus nasi.]

CHAPTER XIV.

EXPECTORANTS.

(Pectorals.)

Expectorants may be defined medicines which promote the secretion from the bronchial tubes and air-passages, and facilitate its discharge. There are no substances which, by a direct or *specific* action on the lungs, produce expectoration; those medicines which are employed with this intention act relatively, that is to say, they operate through the medium of the system generally, relieving or removing that state of disease which demands the use of expectorants. Consequently, most agents which are used under this name are derived from other divisions of medicinal substances; and there are none more uncertain in their effects. There are two modes in which the medicines employed to promote expectoration appear to act: first, by removing constriction of the pulmonary exhalant vessels, on which principle the nauseating expectorants appear to produce their effects; or, secondly, by stimulating these vessels, they either increase the natural exhalation where it is deficient, or alter its character where it is in an unhealthy state. To these we may add all emetic substances which, by their mechanical action, dislodge accumulated secretions from the respiratory organs, and thus frequently become most valuable agents in the treatment of many diseases which demand the use of expectorants.

[The author admits that there are no expectorants which act directly or specifically, and concedes that no medicinal agents are more uncertain in their effects than those arranged under this class; and in defining the indirect manner in which they act, he ascribes

their effects, when they produce or promote expectoration, to three several agencies, which are strictly either *alterative*, *antispasmodic*, or *emetic*, and hence most of the articles of this class will be found enumerated in the alphabetical catalogue of those three divisions. He retains this class, therefore, as he does some others, out of deference to the prescriptive right of tradition, from periods so remote in antiquity, that beyond "the memory of man runneth not."

If there be any form of medication worthy of confidence as directly expectorant, it is not to be found in the introduction of any drug into the stomach. The inhalation of medicated vapour by the lungs, from a suitable vessel at a proper temperature, can alone be strictly expectorant in the sense this name implies; and yet this is not even hinted at by the authors who still retain this fallacious term, which ought to be obsolete, as it serves only to perpetuate error.]

Acidum benzoïcum, D. L. E. *Benzoïc acid. Flowers of Benjamin.*

P. P.—Soft, elastic, pearl-white, satiny crystals or scales, having a faint, aromatic odour, and an acid, penetrating taste. Sp. gr., 0·667.

C. P.—Its composition is $C^{14}H^{6}O^{3}$, combined in the crystalline state with one eq. of water. It is permanent in the air; at a temperature of 248° it fuses, and at 293° sublimes; heated in the open air, it produces a white vapour, which irritates the fauces. Benzoïc acid requires 200 parts of cold water or 12 of boiling water for its solution; it dissolves in 2 parts of cold alcohol or ether, and in a less quantity of acetic acid or oil of turpentine. It possesses the usual characteristics of a weak acid.

Prep.—*Dub.* "Benzoin, 5 parts; recently-burned lime and muriatic acid, of each, 1 part; water, 200 parts; rub the benzoin with the lime, boil for half an hour in 130 parts of water, constantly stirring; let the vessel rest, and pour off the liquor when cold; boil the remainder in 70 parts of water, and again pour off the liquor when cold; boil the mixed liquors to one half, filter through paper, and add gradually the muriatic acid to the liquor when cold; lastly, the liquor being poured off, wash the powder with a small quantity of cold water, dry with a gentle heat, and sublime the benzoïc acid in a proper vessel with a slow fire." *Lond., Edin.* "Benzoin, ℔j. (any convenient quantity, E.); put it into a proper vessel placed on sand (a glass matrass, E.), and, with a gradually-raised heat, sublime as long as anything rises; press that which is sublimed between folds of blotting paper to remove the oil from it, and sublime it again."

[U. S. P.—Mix the benzoin thoroughly with an equal weight of fine sand, and sublime, &c.]

Adulterations.—It is not liable to adulteration, but is often badly prepared; when good it is colourless, entirely sublimed by a gentle heat, and completely soluble in solution of potash or lime-water.

Th. E.—Although formerly highly esteemed as a stimulating expectorant in chronic bronchitis, in the present day it is scarcely ever employed, except in the *Tinctura opii camphorata*, D. E., *Tinctura camphoræ, comp.*, L., and the *Tinctura opii ammoniata*, E., of both of which preparations it is an ingredient.*

* Dr. Ure, of London, has recently called the attention of the profession to the chemical change which takes place in the composition of the urine when benzoïc acid is taken into

D. & M. of Adm.—Gr. v. to gr. xxx.; it should be dissolved in a large quantity of water, as otherwise it is apt to irritate the fauces: its solubility is much increased by giving it with phosphate or biborate of soda.

Incomp.—Alkalies and their carbonates, metallic salts, &c.

Antimonii et potassæ tartras.—*Tartar emetic* (described in the division *Diaphoretics*), administered in small doses from $\frac{1}{10}$ to $\frac{1}{16}$ of a grain frequently repeated, operates as an expectorant; but its effects as such are more certainly manifested if it be given so as to produce nausea. It is best adapted for *acute* attacks of inflammation of the lungs or bronchial membrane.

Balsamum Peruvianum, L. E. Myroxylum Peruvianum, balsamum, D. *Balsam of Peru; Liquid balsam of Myroxylon Peruiferum*, L.—*of Myroxylum Peruvianum*, D. *Fluid balsamic exudation of Myrospermum Peruiferum*, E.—A native of the forests of Peru, New Granada, and Columbia; belonging to the natural family *Amyridaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

B. C.—A lofty, handsome, branching tree, with a smooth, thick, very resinous bark; leaves alternate, pinnated, consisting of eleven leaflets, which are ovate, blunt, and downy on their midrib and petiole; flowers white, in axillary racemes; fruit a legume.

Prep.—It is procured in two ways: the finest, which is not met with in British commerce, by incisions made into the bark of the tree; the second, by boiling the young branches and the bark of the trunk in water; many pharmacologists, however, doubt that any of it is procured by the latter method.

P. P.—Balsam of Peru, as it occurs in English commerce, is a thick, semitransparent, heavy liquid, of a dark reddish-brown colour. It has an agreeable, aromatic odour, and a warm, bitterish taste. Sp. gr., about 1·160.

C. P.—According to the analysis of Fremy, it is composed of an oily matter, which he has named *cinnameïne* of *cinnamomic* acid (*Benzoïc* acid of previous chemists), and one or more resins. Exposed to the air it becomes more dense, but does not dry up; it is inflammable, burning with a bright flame and much smoke, and diffusing a very agreeable odour. It is insoluble in cold water, but water boiled with it acquires its agreeable odour; it is soluble in alcohol in all proportions, but is only partially dissolved by ether.

Adulterations.—It is said to be adulterated with alcohol; this fraud is known by its low density, and by its losing volume when mixed with water.

Th. E.—Balsam of Peru is a mildly stimulating expectorant, and as such was at one time much employed in chronic bronchitis, in the advanced stages of phthisis, and in old asthmatic cases; it has, however, completely fallen into disuse as an internal remedy.

the stomach; the insoluble *uric acid* and its salts are converted into the soluble *hippuric acid* and *hippurates*. He has therefore proposed its employment in all cases accompanied with increased secretion of uric acid, as in gout, rheumatism, and calculous disorders. In a case of uric acid gravel, in which I employed benzoïc acid, the deposite in the urine ceased, while the use of the acid was continued; but returned to a greater extent than before when its administration was stopped.

D. & M. OF ADM.—Min. xx. to min. xl., suspended in aqueous vehicles by means of mucilage or yolk of egg.

BALSAMUM TOLUTANUM, L. E. TOLUIFERA BALSAMUM, RESINA, D. *Balsam of Tolu; Concrete balsamic exudation of Toluifera balsamum*, D.—*of Myroxylon Peruiferum*, L.—*of Myrospermum Toluiferum*, E.—Although the London College, on the authority of Ruiz, refers the balsams of Tolu and of Peru to the same tree, more recent observation has shown that they are from distinct species. The Myrospermum Toluiferum is a native of the mountainous districts of Tolu, Turbaco, and the neighbourhood of the River Magdalena; it belongs to the natural family *Amyridaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

B. C.—Precisely similar to M. Peruiferum, except the leaves, which are oblong, acuminated, and smooth upon the petiole and midrib.

PREP.—It exudes in the liquid state from incisions made into the bark of the tree, but it soon concretes on exposure to the air.

P. P.—In solid masses of a resinous appearance, and a reddish-yellow colour. It has a peculiar, fragrant odour, more agreeable than the balsam of Peru, and a sweet, aromatic taste.

C. P.—Its composition is the same as that of the balsam of Peru. It becomes more solid by exposure to the air; it melts by heat, and is inflammable, burning with a fuliginous flame, and a very agreeable odour. It is soluble in alcohol and ether, and water dissolves out its fragrant acid.

TH. E.—It is a stimulating expectorant, and, in consequence of its agreeable flavour, is very much used as an adjunct to pectoral mixtures; but it should not be employed when there is any inflammatory action present.

D. & M. OF ADM.—Gr. x. to gr. xxx.; it is best administered suspended in aqueous vehicles by means of mucilage or yolk of egg.—*Tinctura Balsami Tolutani*, D. L. *Tinctura Tolutani*, E. (Tolu balsam, ℥i. (℥ij., L.; ℥iiiss., E.); rectified spirit, *by measure*, ℔j. (Oij., L. E.); digest (in a close vessel, D.) until the balsam is dissolved, and filter.) Dose, f℥i. to f℥ij.; it is precipitated when added to water, but it may be suspended in water by means of mucilage or sirup.—*Sirupus Balsami Tolutani*, D. *Sirupus Tolutanus*, L. E. ("Tincture of balsam of Tolu, ℥i.; simple sirup, ℔iss. (℔ij., E.); to the sirup recently made, and not altogether cooled, add the tincture by degrees, agitating briskly," D. E. "Balsam of Tolu, ℥x.; boiling water, Oj.; sugar, ℔iiss.; boil the balsam in the water for half an hour in a vessel lightly covered, frequently stirring, and strain the cooled liquor; then add the sugar, and dissolve it," L.) Dose, f℥ii. to f℥ss., merely as a flavouring adjunct. Tolu lozenges, prepared with the simple sirup and sufficient gum, are a popular and useful remedy in chronic coughs.

BENZOÏNUM, L. E. STYRAX BENZOÏN, RESINA, D. *Benzoïn. The balsam*, L.—*the resin*, D.—*Concrete balsamic exudation*, E.—*of Styrax benzoïn.*—A native of Sumatra, Borneo, and Java; belong-

ing to the natural family *Ebenaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

B. C.—A tall tree with rounded branches, and a whitish bark; leaves entire, pointed, tomentose beneath; flowers in compound axillary racemes.

Prep.—The balsamic exudation is procured by making incisions into the bark of the tree, and allowing the liquid which exudes to concrete on the stem; when it is quite hard it is removed, and fresh incisions made, by which an inferior quality is obtained.

P. P.—Benzoïn occurs in large masses of a reddish-brown colour externally, with a waxy, somewhat shining fracture, presenting many whitish amygdaloid tears, cemented together by a reddish substance; the inferior qualities contain but few tears, and are of a more uniform reddish-brown colour all through. The French pharmaceutists describe another variety in tears of a pale yellow colour, but it is not met with in the English market. Benzoïn has an agreeable, aromatic odour, and a sweet, balsamic taste; the odour and taste of the inferior qualities are much less agreeable. Sp. gr., about 1·065.

C. P.—It is composed of about 28 per cent. of resin soluble in ether, 50 of resin insoluble in ether, and about 20 of benzoïc acid, with a trace of volatile oil, aromatic extract, &c. (Stoltze). It is permanent in the air; heated it fuses, and benzoïc acid is sublimed; it is inflammable, burning with a fuliginous flame and an agreeable odour. It is soluble in alcohol, ether, and acetic acid; boiling water dissolves out the benzoïc acid.

Th. E.—Benzoïn is a stimulating expectorant, formerly much used in chronic cough, in old cases of bronchitis, and in the advanced stages of phthisis; in the present day it is not much employed. Like the other stimulating expectorants, it is inadmissible in inflammatory cases.

D. & M. of Adm.—It is not used in the solid state.—*Tinctura Benzoïni* (*Benzoës*, D.) *comp.*, D. L. E. (Benzoïn, ʒiij. (ʒiiiss., L.; ʒiv., E.); balsam of Tolu (of Peru, E.), ʒi. (ʒx., L.; ʒiiss., E.); (storax, strained, ʒij. (ʒiiss., L.), D. L.); aloes (socotrine, D.; East Indian, E.), ʒss. (ʒv., L.); rectified spirit, *by measure*, ℔ij. (Oij., L. E.); digest for 7 (14, L.) days (pour off the clear liquor, E.), and strain.) A stimulating expectorant. Dose, fʒss. to fʒij., as an adjunct to pectoral mixtures; it is precipitated by water, but may be mixed with water by means of mucilage, yolk of egg, or sirup. This tincture was formerly much employed as an application to wounds and contusions, under the name of *Friar's Balsam*.

Ipecacuanha (described in the division *Emetics*), administered in small but frequently repeated doses, a fourth of a grain to half a grain, acts as an expectorant, but its effects as such are much more surely manifested if nausea be at the same time produced. In some cases of chronic inflammation of the bronchial mucous membrane accompanied with profuse secretion, it operates beneficially, not by promoting expectoration, but by diminishing the discharge, and by some specific action restoring the parts to a healthy state. In acute or inflammatory diseases of the lungs or bronchial tubes,

ipecacuanha, to prove beneficial, must be given in doses sufficient to produce nausea, or even vomiting; but in chronic affections of the same parts, more advantage will be derived from smaller doses. As an expectorant, the doses of ipecacuanha and its preparations are as follows: In *powder*, gr. $\frac{1}{4}$ to gr. ij.—*Vinum Ipecacuanhæ*, D. L. E. Min. x. to min. xl. *Sirupus Ipecacuanhæ*, E., ʒi. to ʒij.—*Pilulæ Ipecacuanhæ comp.*, L. (Compound powder of ipecacuanha, ʒiij.; squill, fresh dried, and ammoniacum, of each, ʒi.; mixture of acacia, q. s.; beat together till they are incorporated.) A useful stimulating expectorant in habitual cough affecting the old and debilitated. Dose, gr. v., three or four times a day. Every five grains contain about a fourth of a grain each of ipecacuanha and opium.

Lobelia, L. E. *Lobelia. Indian tobacco. The herb of Lobelia inflata.*—A native of North America, belonging to the natural family *Lobeliaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Annual, 1 to 2 feet high, with a branching stem; leaves scattered, alternate, oblong; flowers pale blue, in terminal racemes; capsules ovoid, inflated.

P. U. & M. of Prep.—The entire herb is collected in the end of August, as soon as the capsules are formed, and carefully dried. It is imported from America compressed into rectangular masses, being prepared for exportation by the Shaking Quakers of New Lebanon, in the State of New-York.

P. P.—Its odour is faint, but disagreeable, and the taste at first insipid, but when chewed, very acrid, and resembling that of tobacco.

C. P.—According to Pereira, lobelia consists of an acrid volatile oil, a peculiar acid, resin, chlorophylle, gum, extractive, &c. Colhoun has announced the discovery of a new principle in the plant, which has been named *Lobelina*. It yields its active principles to water, alcohol, and ether.

Th. E.—Lobelia was employed by the native Indians of North America as an emetic, but its action as such is highly irritating and attended with much danger, for if it fails to vomit soon after having been taken, it produces all the symptoms of a powerful narcotico-acrid poison, and so small a quantity as a teaspoonful of the powdered leaves has proved in some instances fatal. In less doses it is, however, a most valuable sedative expectorant, apparently possessing a specific power in allaying spasm of the bronchial tubes. It is therefore employed with most benefit in paroxysmal diseases of the lungs, as in asthma and hoopingcough; it has also proved serviceable in the obstinate cough of chronic bronchitis, and in the latter stages of croup.

D. & M. of Adm.—Lobelia is seldom given in the form of powder; the dose, as an expectorant, is from gr. j. to gr. v.—*Tinctura Lobeliæ*, E. (Dried lobelia, in moderately fine powder, ʒv.; proof spirit, Oij.; this tincture is best prepared by the process of percolation as directed for tincture of capsicum, but it may be also made in the usual way by digestion.) Dose, fʒss. to fʒi.; larger doses are apt to prove emetic.—*Tinctura Lobeliæ Ætherea*, E. (Dried

lobelia, in moderately fine powder, ʒv.; spirit of sulphuric ether, Oij.; best prepared by percolation as directed for tincture of capsicum; but it may be also obtained by digestion, in a well-closed vessel, for 7 days.) Dose, min. xx. to min. xl. The latter preparation is usually preferred in asthmatic cases, in consequence of the sedative properties of the sulphuric ether.—*Whitlaw's Ethereal Tincture of Lobelia.* (Dried lobelia, ℔j.; rectified spirit, Oiv.; spirit of nitric ether, Oiv.; spirit of sulphuric ether, ʒiv.; macerate for 14 days in a dark place, and filter.) This is the preparation of lobelia most generally employed in Great Britain. Dose, min. v. to min. xx.

Marrubium vulgare, D. L. *White Horehound.*—An indigenous plant, growing in waste places and by roadsides, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—About a foot and a half high, everywhere hoary with a white, thick pubescence or woolliness; flowers small, white, in crowded whorls.

P. & C. P.—The whole plant has a peculiar, aromatic odour, and a very bitter, balsamic taste. Its properties depend on volatile oil and extractive; it also contains tannic acid; it yields its virtues to boiling water and to alcohol.

Th. E.—White horehound was long held in high estimation as a tonic expectorant. In the present day it is commonly employed as a domestic remedy in chronic coughs; but it is scarcely ever used in regular practice. It is generally given in the form of infusion, *Horehound tea*, prepared by infusing ʒi. of the herb in Oj. of boiling water for an hour, of which the dose is fʒiij. or fʒiv., sweetened with sugar; or in the form of confection, *Candied Horehound*, prepared by evaporating a strong sirup of the herb to dryness, a small bit of which is allowed to dissolve in the mouth frequently.

Scilla.—*Squill* (described in the division *Diuretics*), in small doses frequently repeated, promotes the secretion of the bronchial mucous membrane; it is not, however, a stimulating expectorant, as is generally stated, and may therefore be prescribed in the acute and subacute stages of pulmonary affections as well as in the chronic. It proves more serviceable in the bronchitis and pneumonia of children than in the same diseases in adults. From the property which squill possesses of promoting the secretion of mucus, it facilitates expectoration in some forms of asthma and chronic bronchitis in which the sputa are viscid; in those cases it is advantageously combined with the more stimulating remedies of this class. The dose of powdered squill as an expectorant should not exceed gr. j., frequently repeated. The oxymel or sirup is one of the most useful expectorants we possess for the pulmonary affections of children, in doses of min. x. to min. xxx. The tincture is employed as an adjunct to pectoral mixtures in chronic bronchial affections. Dose, min. x. to min. xxx.—*Pilulæ Scillæ comp.*, D. L. (Squill, fresh dried and powdered, ʒij.; ginger, powdered, ʒiij. (ʒij.,

L.); ammoniacum, powdered, ʒij.; hard soap, ʒiij.; mix the powders together, add the soap, and, with sufficient treacle (sirup, L.), beat to a proper consistence.)—*Pilulæ Scillæ*, E. (Squill, in fine powder, 5 parts; ammoniac, ginger, in fine powder, and Spanish soap, of each, 4 parts; conserve of red roses, 2 parts; mix the powders, add the other articles, beat them into a uniform mass, and divide it into five-grain pills.) Dose, gr. v. to gr. xv., in chronic catarrh and asthma. It spoils by keeping.

Senega, L. E. Polygala senega, radix, D. *Seneka. Virginian snakeroot. Root of Polygala Senega.*—A native of the United States, belonging to the natural family *Polygalaceæ*, and to the Linnæan class and order *Diadelphia Octandria.*

B. C.—Root perennial; stems numerous, annual, from nine inches to a foot high; leaves sessile, ovato-lanceolate; flowers small, white, in spiked racemes; capsule small, elliptical, containing two small black seeds.

P. P.—Root about the thickness of a writing pen, contorted, knotty, marked with slight eminences on one side; cortical portion resinous, grayish or yellowish externally, whitish internally; central portion (*meditullium*) whitish, woody, inert. The root has a faint, peculiar odour, and a taste at first mucilaginous, afterward nauseous and acrid.

C. P.—It is composed of tannic and pectic acids, wax, fixed oil, gum, albumen, colouring matter, lignin, some salts, and a peculiar acrid principle, which, according to Quevenne, consists of two volatile acids, named by him *Polygalic* and *Virgineic* acids. It yields its active principles to both water and to alcohol; according to some recent observations, it appears that, by the action of boiling water on the root, the active principle is formed into an insoluble compound with the colouring matter and albumen; therefore the Edinburgh College has substituted an infusion for the decoction of the other pharmacopœias.

Th. E.—Seneka root is a stimulating expectorant of much power, peculiarly fitted for the advanced stages of chronic bronchitis and of pneumonia, especially when occurring in the aged and debilitated. It is also a very valuable remedy in protracted hooping-cough, and in the latter stages of croup and of bronchitis in infants and children.

D. & M. of Adm.—In powder, gr. x. to ʒss.; this is the best form for the administration of seneka in the pulmonary affections of children.—*Decoctum Senegæ*, D. L. (Seneka, ʒiij. (ʒx., L.); water (distilled, L.), ℔iss. (Oij., L.); boil down to ℥viij. (Oj., L.), and strain.) A bad form, for the reasons stated above.—*Infusum Senegæ*, E. (Seneka, ʒx.; boiling water, Oj.; infuse for four hours in a covered vessel, and strain.) An excellent vehicle for other remedies in old cases of catarrh and bronchitis. Dose, f℥ij. to f℥iij.

[U. S. P.—*Sirup of Seneka.* Take of seneka, bruised, 4 oz.; water, a pint; sugar, a pound. Boil the water with the seneka to one half and strain, then add the sugar, and proceed in the manner directed for sirup.]

STYRAX, L. E. STYRAX OFFICINALE, RESINA, D. *Storax. Resin*, D.—*Balsamic exudation*, L. E.—*of Styrax officinale.*—A native of the Levant, Palestine, Arabia, and cultivated in the South of Europe; it belongs to the natural family *Ebenaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—Stem 15 to 25 feet high, branching at the top; leaves alternate, ovate, villous beneath; flowers white, in small racemes; fruit a coriaceous capsule, downy, one-seeded.

PREP.—The process followed for obtaining storax from the tree is not accurately known, but it is supposed to be procured from incisions made into the tree, or from the punctures of insects.

P. P.—A great many varieties of storax have been described by pharmacologists; two are most generally met with: 1. *Liquid storax;* of this I have met with two sorts; one, a grayish substance of the consistence of bird-lime, with a strong naphtha odour; it acquires a dirty brown colour on exposure to the air; the other, a shining black, very viscid liquid, becoming more fluid when heated, with a very agreeable, aromatic odour; both sorts have a pungent, balsamic taste. 2. *Common storax;* this is in very friable, reddish-brown masses, with an agreeable, aromatic odour, and a warm, somewhat acrid taste; it appears to be sawdust cemented together by some liquid resin.

C. P.—The medicinal virtues of storax depend on the presence of volatile oil, benzoïc acid, and resinous extractive. It yields its properties to alcohol, but merely its fragrancy to boiling water.

Adulterations.—No accurate account could be given of the adulterations of storax, so many different substances are sold under that name. The gray liquid storax is manifestly some compound of impure naphtha.

TH. E.—Formerly employed as an expectorant in the same cases as benzoïn; in the present day it is only used as an ingredient in the *Pilulæ Styracis*, to conceal the odour and taste of opium.

PHARM. PREP.—*Styrax colatus*, L. *Extractum Styracis*, E. (Dissolve storax in (by boiling in successive quantities of, E.) rectified spirit, and strain; distil off the spirit, and evaporate with a gentle heat (over the vapour-bath, E.) to a proper consistence, L.; the consistence of a thin extract, E.) Only used in the above-mentioned preparation.

CHAPTER XV.

NARCOTICS.

(Anodynes—Hypnotics—Soporifics.)

NARCOTICS may be defined medicines which produce a primary stimulating effect on the nervous and vascular systems, but which is rapidly followed by a depression of the vital powers and sleep, or, if a large quantity of the substance be swallowed, coma. The primary stage, that of excitement, varies much both as to the de-

gree in which it is produced and as to its duration, depending chiefly on the manner in which the narcotic is administered, on idiosyncracy, and on habit. In large doses, the stage of excitement is so short, and the depression of vital power so immediate, that it has led many to deny the stimulant property of narcotics altogether, and to regard them as producing direct sedative effects on the system. An attentive consideration, however, of the *modus operandi* of the medicinal agents described in this chapter, and a comparison of them with those which are contained in the chapter on Sedatives, will, I think, satisfactorily prove that their operation is perfectly different. Indeed, some narcotics, as opium, are frequently administered with the intention of producing a stimulant action only. When given with this intention, the doses should be small, but frequently repeated, in order to sustain the state of excitement; but when administered with the view of producing sleep, the doses should be larger, and repeated at more distant intervals. Idiosyncracy influences much the effects of narcotics; we meet with some individuals almost insensible to their action; while in others, small doses produce a dangerous stupifying effect, or in some instances give rise to a degree of excitement amounting to furious delirium. But habit influences the action of narcotics on the system more than any other circumstance, their power being diminished in a remarkable degree by repetition; it will therefore be necessary, where their continued administration is required, gradually to augment the dose, in order to produce their usual effects.

[In the introduction to this chapter, the author exhibits a discriminating mind, and has here condensed within a brief paragraph all that is known upon this intricate subject. And yet it must be obvious that the modus operandi of narcotics, even as explained by the enlightened theory here presented, is far from being satisfactory. The fault is not in the author, nor in his therapeutical philosophy, but depends on the stubbornness of the facts we have to deal with, and the unfathomed mysteries which encompass them. And yet the student will be perplexed as he peruses the chapters which succeed the present still more, nor can he extricate himself but by retaining in his mind the rational and truthful definition here given of *Narcotics*, as well as the numerous modifications in the effects produced by this class of agents upon the human system under different circumstances and in varied doses.

With this key he may unlock the mysteries which otherwise envelop the subsequent divisions of the Materia Medica into general and special stimulants, sedatives, contra-stimulants, and even refrigerants, in their several therapeutical effects. He cannot fail to perceive that narcotics are directly *stimulants*, either *general*, *special*, or both; while that they are indirectly sedative and contra-stimulant is equally obvious. Hence he will be prepared to doubt whether any *sedative* is so without being a stimulant primarily; and especially when he is here taught that the depression of the vital power by *narcotics* is often so immediate as to lead many to the denial of their being stimulants altogether. Moreover, as the

dose of any *narcotic* may be so regulated as to be a *stimulant* only, and, on the contrary, the dose of a *stimulant* may be so augmented as to become a *narcotic*, *sedative*, *contra-stimulant*, or *refrigerant*, the philosophic student will strongly incline to the opinion that all these separate divisions are only modifications of a single class of therapeutic agents; and that, however they may be conventionally recognised by those who have a passion for minute and systematic distinctions, they are wholly theoretical. Like the artificial division of the body into regions or systems, for the convenience of study and the facility of memorizing, they are not to be mistaken for scientific accuracy or truth. Still, however, he must be a bold adventurer in this department who will hazard his reputation by proposing the reform so much needed, and reducing the number of classes in the Meteria Medica within the narrow limits prescribed by facts, as contra-distinguished from theory. As the author of this work has wisely ventured to think for himself, and deviated from the beaten track on some peculiarities of his classification, it is much to be regretted that he did not go a step farther, and reduce the number of his divisions, by rejecting both the name and the thing, when he felt, as he appears in some cases to have done, that there are distinctions without differences, and which have no claim to respect other than that of antiquity.]

Belladonna, L. E. Atropa belladonna, folia et radix, D. *Leaves* (*and root*, D.) *of Atropa belladonna. Deadly nightshade.*—An indigenous plant, belonging to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Root fleshy, creeping; stems 3 to 4 feet high, herbaceous; leaves ovate, acute, entire, smooth, some very large, but placed in pairs of unequal sizes; flowers axillary, on short peduncles, drooping, lurid purple, about an inch long; berries shining, black, about the size of a black cherry, filled with a sweetish pulp, in which are imbedded many kidney-shaped seeds.

P. U. & M. of Prep.—The root, which is contained only in the *Dublin Pharmacopœia*, is scarcely ever used at present; it should be dug up in the month of March, and dried quickly. The leaves are gathered in June and July, before the flowers expand, and dried with a stove heat.

P. P.—Belladonna root is from one to two inches in diameter, and a foot or more in length; it is of a grayish-white colour internally, grayish-yellow externally; it has a faint, nauseous odour, and a slightly astringent, bitter taste. The leaves, when fresh, are of a sombre-green colour, which becomes yellowish-green in drying; they have a feeble odour, and an herbaceous, somewhat nauseous taste.

C. P.—The medicinal properties of belladonna depend on a peculiar principle which has been named *atropia;* it was first discovered by M. Brandes in the leaves, in which he found it to exist in combination with malic acid, two nitrogenous extractive matters called by him *pseudotoxin* and *phytocolla*, gum, wax, chlorophylle, starch, albumen, lignin, salts, &c. Atropia, when obtained quite pure, is in white, transparent, prismatic cristals, of a silky lustre. It is without odour: it requires for its solution 500 parts of cold

water, the solution having a bitter taste and an alkaline reaction; but is very soluble in alcohol and ether; it combines with acids to form salts. The composition of atropia, according to Liebig, is $C^{34}H^{23}O^{6}N$. Belladonna leaves and root yield their active principles to both water and alcohol.

Adulterations.—The leaves of the *Solanum nigrum* are sometimes sold for those of the Atropa belladonna; the former are smaller, obtuse angled, not acuminated, and they are bluntly toothed, by which characters they may be readily distinguished.

Th. E.—Belladonna acts on the system as a powerful narcotic, in large doses proving an active poison, causing constriction of the throat with ineffectual efforts to vomit, delirium usually of a gay or mirthful character, with excessive dilatation of the pupils, then coma, which is followed by death unless active treatment be immediately employed. In medicinal doses it operates as an anodyne and calmative, diminishing pain and over-excitement of the nervous system; with this intention it has been employed in most neuralgic and convulsive diseases, but for some years back it is not so much used as it formerly was. It has been generally stated that belladonna should not be employed in acute inflammation or febrile affections, but more recent observations have shown that a state of inflammation in the system does not contra-indicate its use. The diseases in the treatment of which belladonna is found most beneficial are the varieties of neuralgia, and spasmodic and painful affections; thus, it has been found most useful in tic douloureux, in all forms of external neuralgic pains, in nervous palpitations, in hoopingcough, in spasmodic stricture of the urethra, in painful spasm of the *sphincter ani* when there is no fissure of the part, in painful glandular enlargements, in chronic arthritis, and in the flying pains of rheumatism. In all those cases, the external employment of the drug is advantageously combined with its internal administration. In some instances belladonna produces a rash on the skin resembling scarlatina, on which account it has been proposed as a prophylactic of that disease when it rages as an epidemic, and several instances of its apparent success as such were narrated in Germany, but later experience has not confirmed the anticipations which were so confidently put forward at first. Belladonna applied externally in the neighbourhood of the eye, causes, after the lapse of a few hours, dilatation of the pupil unattended with any disturbance of vision; to produce this effect, it is employed in the operation for cataract; in iritis, to prevent adhesions from forming; and in other ophthalmic affections, to enable the posterior chamber of the eye to be examined with greater facility. Atropia has not been employed in medicine in Great Britain; on the Continent a solution of it has been used to dilate the pupil.

D. & M. of Adm.—Dose of the powdered leaves, gr. j., which should be increased very gradually until dryness of the throat is produced.—*Extractum Belladonnæ*, L. E. *Succus spissatus Belladonnæ*, D. ("Fresh belladonna leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice,

and evaporate it unstrained to a proper consistence," D. L. "Fresh belladonna, any quantity; bruise it in a marble mortar into a uniform pulp; express the juice; moisten the residuum with water, and express again. Unite the expressed liquids, filter them, and evaporate the filtered liquid in the vapour-bath to the consistence of firm extract, stirring constantly towards the close," E.) Dose, gr. ss., gradually increased to gr. iij. or gr. iv. This is the preparation generally employed to dilate the pupil, for which purpose it is applied around the eye; in spasm of the urethra, preventing the introduction of an instrument, the catheter has been smeared with extract of belladonna. It has been applied to the os uteri in protracted labour caused by rigidity.—*Emplastrum Belladonnæ*, D. L. E. ("Inspissated juice of belladonna, ℥j.; soap plaster, ℥ij.; make a plaster," D. "Resin plaster, ℥iij.; extract of belladonna, ℥iss.; add the extract to the plaster, melted by the heat of a vapour-bath (with a gentle heat, E.), and mix them," L. E.) An excellent local application over the sacrum in dysmenorrhœa, and for the relief of neuralgic and other pains.—*Unguentum Belladonnæ.* (Extract of belladonna, ʒij.; axunge, ℥j.; mix.) In painful hemorrhoidal affections, in chordee, and in neuralgia.—*Succus Belladonnæ.* (Prepared by expressing the fresh leaves collected in the beginning of July, setting aside the expressed juice for 48 hours, and adding to the clear decanted liquor a fifth part of rectified spirit.) Dose, min. xx. to min. xl., gradually increased.—*Tinctura Belladonnæ*, Blacket. (Extract of belladonna, ʒx.; proof spirit, f℥xvj.; macerate for 14 days, and strain.) Dose, min. ij. to min. iij.; fʒi. added to f℥viij. of liquid has been used as a lotion.

In poisoning with belladonna, stimulating emetics followed by active cathartics should be employed, with cold applications to the head; and if coma be present, ammonia should be administered, and the usual external stimulants applied.

Cannabis Indica. *Indian Hemp.* [*Apocynum Cannabinum*, U. S. P.]—According to the most recent observations, it would appear that the Indian hemp is precisely identical in botanical characters with the common hemp of Great Britain, the *Cannabis sativa;* differing only in the secretion of a resin with which it abounds, and which is totally absent in the European kind. It grows in India and Persia, and belongs to the natural family *Urticaceæ*, and to the Linnæan class and order *Diœcia Pentandria.* [Indigenous in the United States.]

B. C.—Annual, about 3 feet high; stem branching, pubescent, angular; leaves alternate or opposite, digitate, scabrous, on long, weak petioles; leaflets linear, lanceolate, sharply serrated; flowers diœcious, in axillary clusters; achenium ovate, one-seeded.

P. U. & M. of Prep.—The dried plant and resin; the former is cut when the plant is in flower, and allowed to dry in the sun for three days, care being taken not to remove the resin; it is called in India *Gunjah.* The resin, which is called *Churrus*, is collected in Central India and in Nipal in the following manner: "Men clad in leathern dresses run through the hemp-fields, brushing through the plant with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off, and kneaded into balls; a finer kind is collected with the hand; in some in-

stances the leathern attire is dispensed with, and the resin is gathered on the skins of naked coolies."—(O'Shaughnessy.)

P. P.—*Gunjah* is sold in bundles about two feet long and three inches in diameter; it consists of the stems with the leaves and flowers accreted together by the resinous exudation; it is of a dusky-green colour, and has an agreeable, narcotic odour (as met with in Great Britain, however, the odour is feeble), and a bitter taste, resembling that of tobacco. *Churrus* is a hard resin, of a blackish-gray colour, a fragrant, narcotic odour, and a bitterish, acrid, slightly warm taste; it is not generally met with in Great Britain. The leaves and capsules without the stalks are sold in India under the name of *Bang*, *Subjee*, or *Sidhee;* they have been also imported into Britain, but their medicinal property is very feeble; they should not, therefore, be employed in the preparation of the extract or tincture.

C. P.—The medicinal virtues of the Indian hemp are due to the resin which it contains, and which has been named *cannabin;* it also contains a small quantity of volatile oil, which has not been examined. The dried plant yields to alcohol about 20 per cent. of resinous extract, which is of a dark reddish-brown colour; has a rather fragrant, narcotic odour, resembling that of *Canaster tobacco;* and a bitter, somewhat acrid taste.

Adulterations.—Several specimens of the extract of Indian hemp which I have met with did not possess the peculiar odour or taste of the extract as prepared by myself; whether this arose from faulty preparation, or the substitution of some other substance, I cannot say. The true extract is readily known by its peculiar odour and taste.

Th. E.—Although the Indian hemp has been used in Persia, and throughout India, for many hundred years, for producing inebriation, and also as a medicinal agent, it has been only very recently introduced into British medicine, through the exertions of Dr. O'Shaughnessy, late of Calcutta; consequently, the observations made on its medicinal virtues have been as yet very limited. In its action on the system it is decidedly narcotic, producing at first the effects of a powerful stimulant, which, if the dose taken be sufficiently large, are soon followed by those of a direct sedative. The preparations of the Indian hemp have been chiefly employed in the treatment of neuralgic and painful affections, in most of which they have proved very beneficial. Thus they have been given in tetanus, hydrophobia, infantile convulsions, sciatica, chorea, neuralgic pains, and chronic rheumatism; they have also been used to subdue sleeplessness or disturbed rest, provided it does not arise from inflammation in the head. All who have tried the effects of this remedy in the British Isles, have come to the conclusion that the Indian hemp must be given in much larger doses in Great Britain than in the East, and since his return home, this has been acknowledged by Dr. O'Shaughnessy himself. The trials made with it in the diseases above enumerated would seem to show that the Cannabis Indica may be used with benefit as a substitute for opium,

in cases for which that drug is unsuited from idiosyncrasy or any other cause; and also that it will occasionally succeed in abating, sometimes in completely removing pain, where this agent totally fails us. In consequence of its stimulating properties, the use of the Indian hemp is contra-indicated in acute inflammatory diseases.

D. & M. of Adm.—The preparations of this drug which are at present in use are the resinous extract and a tincture; they are prepared as follows: *Extractum Cannabis.* (Take of the dried flowering tops, rejecting the stems, any quantity; rectified spirit, a sufficiency; boil the tops in the spirit until all the resin is dissolved out; distil off the spirit with the heat of a vapour-bath, so as to obtain an extract of a proper consistence.) Dose, gr. x. to gr. xij., gradually increased until a tendency to coma is produced; gr. ss. to gr. iss. is the dose usually given in the East, and this quantity frequently produces marked effects there. It is best given in the form of pill.—*Tinctura Cannabis*, O'Shaughnessy. (Extract of Indian hemp, gr. iij.; proof spirit, f3i.; dissolve.) Dose, f3j. to f3ij., frequently repeated until the desired effect is produced. This tincture is decomposed by water, the resin being precipitated in the form of a pale yellow powder. It should, therefore, be suspended in aqueous vehicles, by means of mucilage, sirup, or yolk of egg.

Hyoscyamus, E. Hyoscyamus niger, folia (et semina, L.), D. L. [Hyoscyami folia, U. S. P.] *Henbane; the leaves (and seeds, L.) of Hyoscyamus niger.*—An indigenous plant, belonging to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Annual or biennial; stem much branched, rounded; leaves subovate, amplexicaul, sinuated; flowers nearly sessile, dingy yellow, with purplish veins; capsules 2-celled, many-seeded, when the seeds are ripe the upper part falling off like a lid; the whole plant is covered with unctuous, fetid hairs.

P. U. & M. of Prep.—The leaves of the biennial plant should be preferred; they are to be gathered when the plant is in full flower, and dried quickly at a temperature not above 120°. The seeds are only contained in the London Pharm.; they should be collected when fully ripe.

P. P.—Hyoscyamus leaves, when carefully dried, are of a greenish-yellow colour, have a clammy feel, a fetid, narcotic odour, and a bitter, nauseous taste; in the fresh state, the odour and taste are both more powerful, and the colour is dull green. The seeds are ovoid, compressed, rough, of a brownish-yellow colour; they have a feeble narcotic odour, and a bitter, somewhat acrid taste.

C. P.—Hyoscyamus leaves contain a narcotic extractive soluble in water and alcohol, bitter extractive, gummy extractive, and salts of magnesia (Lindbergson). M. Brandes announced the discovery of a vegetable alkaloid, which he named *hyoscyamia*, in the leaves and seeds of the Hyoscyamus niger, but his statements have not been confirmed by more recent experiments. Runge has, however, showed that this was owing to the employment of a caustic alkali to separate it; and by using magnesia for this purpose he has obtained vegetable alkalies from belladonna, henbane, and stra-

monium, the three of which resemble each other so closely, that there is reason for believing that they are identical. According to the analysis of Kirshoff, the seeds consist of 28·3 per cent. of volatile and narcotic matter, 15·6 per cent. of fixed oil with some resin, 2·3 per cent. of extractive, with sugar, gum, lignin, albumen, and some salts. The leaves and seeds of the henbane impart their virtues to water, alcohol, ether, and the fixed and volatile oils.

Adulterations.—The admixture of any other leaves with those of the Hyoscyamus niger may be readily detected by their physical properties. The leaves lose much of their activity by keeping; they should, therefore, be gathered every year. When henbane is badly preserved, the odour and taste are very feeble.

Th. E.—Taken in large quantity, every part of this plant acts as a powerful narcotico-acrid poison, producing delirium, followed by sopor with marked dilatation of the pupil, which, if active treatment be not immediately employed, is the precursor of death. In medicinal doses, its operation is narcotic; but it is distinguished from most other medicines of this class by several peculiarities. Thus, the preliminary or stimulant stage of its operation, even when taken in small doses frequently repeated, is very slight, often not at all discernible; and in the second stage of its operation, it causes sleep, rather by lessening excitability and allaying pain than by any direct action on the nervous system; under its continued use, also, the bowels are gently acted on, and do not become constipated, as occurs when opium is taken. In consequence of these properties, hyoscyamus is employed with much advantage in many painful diseases in which the use of opium is objectionable from any circumstance. It is especially found beneficial in sleeplessness or irritability, when the symptoms of pyrexia, as hot skin, thirst, delirium, &c., are present; in all forms of neuralgic and spasmodic affections where there is great excitability of the nervous system, and in which the stimulating effects of opium would prove injurious; in irritation of the bronchial mucous membrane causing cough; and in diseases of the urinary organs. There are, however, many persons in whom hyoscyamus will produce great excitement, headache, and even delirium; and in such its use should be carefully avoided. Externally, fomentations or cataplasms of hyoscyamus are employed to diminish pain in glandular enlargements, painful ulcerations, hemorrhoidal affections, &c. Given in combination with active cathartics, it corrects their griping qualities without diminishing their activity.

D. & M. of Adm.—In powder, the leaves may be given in doses of gr. v. to gr. x.; or the seeds in doses of gr. iij. to gr. viij.; the following preparations, however, are generally employed: *Extractum Hyoscyami*, L. E. *Succus spissatus Hyoscyami*, D. ("Prepared in the same manner as the similar preparation of belladonna," D. L. "To be prepared by any of the processes directed for extract of conium," E.) The continued evaporation by heat to which this extract is subjected, when prepared according to the formula of the Dublin and London Colleges, impairs its activity; prepared

according to the Edinburgh Pharmacopœia, it is much more powerful. Dose, gr. v. to gr. xv., given in the form of pill.—*Tinctura Hyoscyami*, D. L. E. (Hyoscyamus leaves, dried (and in moderately fine powder, E.), ʒv. ; proof spirit, ℔ij. (Oij., L. E.) ; digest (macerate, L.) for 7 (14, L.) days, and strain. "It is best prepared by the process of percolation, as directed for tincture of capsicum," E.) Dose, fʒss. to fʒij.—*Succus Hyoscyami.* (Fresh hyoscyamus leaves, any quantity ; express the juice with a powerful press, set aside for 48 hours, pour off the clear supernatant liquor, and add to it a fifth part of rectified spirit.) This is the best preparation of henbane. Dose, min. xx. to min. xl.

In poisoning with hyoscyamus, stimulating emetics and the stomach pump should be immediately employed, to be followed by external and internal stimulants, and afterward bloodletting. Several cases of poisoning with henbane have been recently published in one of the Italian journals, in which lemon juice in large quantity proved a complete antidote.

LACTUCARIUM, L. E. LACTUCA SATIVA, HERBA, D. LACTUCA VIROSA, FOLIA, D. *Lactucarium. Lettuce opium. The inspissated juice of Lactuca sativa*, L.—*of Lactuca sativa and Lactuca virosa*, E. *The herb of Lactuca sativa, and the leaves of Lactuca virosa*, D.—Both those species of Lactuca belong to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Æqualis.* The former, though extensively cultivated in the British Isles, was originally introduced probably from the East ; the latter is indigenous.

B. C.—*L. sativa* is an annual ; stem erect, smooth, cylindrical, branching above, 1 to 2 feet high ; leaves rounded or ovate, more or less wrinkled, generally sheathing at the base, of a pale green colour ; flowers pale yellow, small, in terminal corymbs. *L. virosa* is a biennial ; stem erect, prickly, 3 to 4 feet high ; leaves distant, patent, oblong, toothed, two-eared and amplexicaul at the base, their keel prickly ; flowers small, yellow, in panicles.

P. U. & M. OF PREP.—As soon as the flowering stem of either of those plants shoots up, it abounds in a white milky juice, which did not before exist ; this juice, when dried spontaneously, constitutes *lactucarium* or *lettuce opium.* It is obtained by slicing off the flowering head before the flowers expand, collecting the milky juice which exudes, and removing a fresh slice of the stem as long as it yields any white juice. The recent investigations of Mr. Duncan, of Edinburgh, have shown that the L. virosa yields three times as much lactucarium as the garden lettuce, and that its quality also is superior.

P. P.—It is met with in large, roundish, rough masses, of an umber brown colour ; it has a narcotic odour, which closely resembles that of opium, and a disagreeable, bitter taste.

C. P.—Lactucarium consists of a peculiar neutral bitter principle which has been named *Lactucin*, a volatile oil, a yellowish red, tasteless resin, a greenish-yellow, acrid resin, crystallizable and uncrystallizable sugar, gum, pectic acid, a brown basic substance, a principle like humus extractive, a concrete oil or wax, and numerous salts (Walz). Of these, the *Lactucin* appears to be the active principle. By heat lactucarium softens, and is partially fused ; it is inflammable, and burns with a white flame. It yields its virtues

partially to cold or boiling water, more completely to alcohol or ether.

Th. E.—Lactucarium, in its operation on the system, resembles opium in many respects, but it produces scarcely any excitement, consequently it may be employed as a substitute for that drug in cases in which a stimulant effect is objectionable. It is, however, uncertain in its operation, and in many persons, even when given in very large doses, does not produce any effect. It has been principally employed as an anodyne in phthisis, but when its use has been continued for even a comparatively short period, I have found it to lose its powers of producing rest, although the quantity given was much increased. Lactucarium has also been employed as a narcotic in febrile and inflammatory affections, in rheumatism, in arthritis, and in nervous disorders, where opium is contra-indicated from any cause.

D. & M. of Adm.—Gr. v. to gr. xx., in the form of pill.—*Tinctura Lactucarii*, E. (Lactucarium, in fine powder, ʒij.; proof spirit, Oj.; this tincture is best made by percolation as directed for tincture of myrrh, but may also be prepared by digestion with coarse powder of lactucarium.) Dose, fʒi. to fʒij. Every fluid drachm of this tincture contains gr. vj. of lactucarium.—*Trochisci Lactucarii*, E. (To be prepared with lactucarium, in the same proportion, and in the same way as opium lozenges.) Dose, ℈i. to ℈ij., daily. Each lozenge of ten grains contains nearly one seventh of a grain of lactucarium.—*Extractum Lactucæ*, L. (Fresh lettuce leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evoporate it, unstrained, to a proper consistence.) A bad preparation, sometimes substituted for lactucarium, from which it may be known by its greater compactness and very feeble odour. Dose, ℈i. to ʒi.

Lupulus, L. E. Humulus lupulus, strobili siccati, D. *Hops. The dried Strobiles* (*Catkins*, E.) *of Humulus lupulus.*—Scarcely indigenous, probably introduced from Holland; it belongs to the natural family *Urticaceæ*, and to the Linnæan class and order *Diœcia Pentandria.*

B. C.—Stems long, weak, and climbing, scabrous; leaves petiolate, 3 to 5 lobed, serrated, veiny, rough; flowers greenish-yellow.

P. U. & M. of Prep.—The aggregated fruits, *catkins* or *strobiles*, when dried, constitute the hops of commerce; they are gathered and picked in September, and dried in kilns.

P. P.—Hops occur in the form of thin, papery, greenish-yellow scales, variously veined, and sprinkled with a golden-yellow powder; they have a peculiar aromatic odour, and an aromatic, very bitter taste.

C. P.—The principal virtue of hops is due to the yellow powder, which has been called *lupulin;* it constitutes about a sixth part of good hops, and may be readily obtained in a separate state by rubbing and sifting. The scales are composed of astringent matter, inert colouring matter, chlorophylle, gum, lignin, and salts of potash

and lime, with some adhering *lupuline* (Payen and Chevallier). Lupulin is in the form of a coarse yellow powder, of a cellular texture; it consists of 2 per cent. of volatile oil, 10·3 of bitter principle (*lupulite*), 50 to 55 of resin, 32 of lignin, &c. Hops and lupulin yield their active properties to both water and alcohol.

Th. E.—Much difference of opinion exists as to the therapeutical properties of hops; they are generally stated to be narcotic, but, from the experiments made with them by Magendie and others on animals, it would appear that this effect is not manifested when they are given internally, no matter how large the dose. Nevertheless, the inhalation of the aroma of hops acts decidedly narcotic, frequently producing sleep in the restlessness and watchfulness of mania and other nervous affections, when opium and other narcotics have completely failed. To produce this effect, a pillow stuffed with hops is generally employed. The solution of the bitter principle of the hop in malt liquors serves to make them keep better, and also confers on them aromatic and tonic properties.

D. & M. of Adm.—*Lupulin*, gr. vj. to gr. xij., in powder or pill; if the hop possess any narcotic property, it must be concentrated in this substance, as in it alone is centred all the aroma.—*Extractum Humuli*, D. *Extractum Lupuli*, L. E. ("Prepared as the simpler extracts," D. "As the extract of logwood," E. "Hops, ℔ss.; boiling distilled water, cong. ij.; macerate for 24 hours; then boil down to a gallon, and strain the liquor while yet hot; lastly, evaporate to a proper consistence," L.) Dose, gr. v. to gr. xx.—*Infusum Lupuli*, L. (Hops, ʒvj.; boiling distilled water, Oj.; macerate for 4 hours in a vessel lightly covered, and strain.) A mild bitter, very feebly, if at all narcotic. Dose, fʒj. to fʒij.—*Tinctura Humuli*, D. *Tinctura Lupuli*, L. E. ("Hops, ʒv. (ʒvj., L.); proof spirit, ℔ij. (Oij., L.); macerate for 14 days (frequently shaking, D.), and strain," D. L. "Take any convenient quantity of hops recently dried, separate by friction, and sifting the yellowish-brown powder attached to their scales; then take of this powder ʒi., and of rectified spirit fʒviij., and prepare the tincture by percolation or digestion, as directed for tincture of capsicum," E.) Dose, fʒss. to fʒij.

Morphia, L. *Morphia. A peculiar principle, on which the medicinal activity of opium chiefly depends.*

Prep.—*Lond.* "Hydrochlorate of morphia, ʒi.; solution of ammonia, fʒv.; distilled water, Oj.; add the hydrochlorate of morphia, first dissolved in the pint of water, to the solution of ammonia with an ounce of water, shaking them together; wash what is thrown down with distilled water, and dry it with a gentle heat."

[U. S. P.—Take of opium, sliced, a pound; distilled water, alcohol, each, q. s.; solution of ammonia, 6 fluid ounces. Macerate the opium with 4 pints of distilled water for 24 hours, and having worked it with the hand, digest for 24 hours, and strain. In like manner macerate the residue twice successively with distilled water, and strain. Mix the infusions, evaporate to 6 pints, and filter; then add first 5 pints of alcohol, and afterward 3 fluid ounces of the solution of ammonia, previously mixed with half a pint of alcohol. After 24 hours, pour in the remainder of the solution of ammonia, mixed as before with ½ a pint of alcohol, and set the liquor aside for 24 hours, that crystals may form. To purify these, boil them with 2 pints of alcohol till they are dissolved, filter the solution while hot through animal charcoal, and set it aside to crystallize.]

P. P.—Thus obtained, morphia is in the form of a white crystalline powder, the crystals being very minute; but, by solution in boiling alcohol and slow evaporation, they may be obtained much larger; their primary form is the right rhombic prism. They are inodorous, but have a sensibly bitter taste.

C. P.—It consists of $C^{35}H^{20}O^{6}N$. It is permanent in the air, it is fused by heat, and by a high temperature it is decomposed. It is inflammable, burning with a bright flame and a peculiar odour, and leaving a carbonaceous residuum. It requires 1000 parts of water to dissolve it, the solution possessing an alkaline action; it is scarcely soluble in ether, but dissolves in 40 times its weight of cold and in 30 times its weight of boiling alcohol; it is very soluble in solution of caustic potash, lime-water, or ammonia. The best characteristic of morphia and its salts is the property which they possess of striking a deep blue colour with the solution of a per-salt of iron made as nearly neutral as possible.

Th. E.—Morphia, on account of its insolubility, is not used in medicine; its therapeutical effects, therefore, will be more conveniently considered when treating of the muriate of morphia, the most frequently employed of its salts. The dose of the pure alkaloid would be from one fourth to one half of a grain, in the form of pill.

Morphiæ acetas, L. E. *Acetate of Morphia.*

Prep.—*Lond.* "Morphia, ʒvj.; acetic acid, fʒiij.; distilled water, fʒiv.; mix the acid with water, and pour them upon the morphia to saturation. Let the liquor evaporate with a gentle heat, that crystals may be formed." *Edin.* "Muriate of morphia, any convenient quantity. Dissolve it in 14 times its weight of warm water; and when the solution is cool, add aqua ammoniæ gradually, and with constant agitation, until there is a permanent but faint odour of ammonia in the fluid. Collect the precipitate on a calico filter, wash it moderately with cold water, and dissolve it by means of a slight excess of pyroligneous acid in 12 parts of warm water for every part of muriate of morphia that was used. Concentrate the solution over the vapour-bath, and set it aside to crystallize. Drain and squeeze the crystals, and dry them with a gentle heat. More acetate of morphia may be obtained on concentrating the mother-liquor."

[U. S. P.—Morphia, in powder, freed from narcotina by boiling with sulphuric ether, 1 oz.; distilled water, half a pint; acetic acid, a sufficient quantity. Mix the morphia with the water, then carefully drop in the acid, constantly stirring, until the morphia is saturated and dissolved. Evaporate the solution by the water-bath to the consistence of a sirup. Lastly, dry the acetate with a gentle heat, and rub it into powder.]

P. P.—As usually met with, acetate of morphia is a grayish-white powder, sometimes obscurely crystalline; when pure, however, it is snow-white, and in distinct crystals. It is inodorous, but when moistened emits a feeble odour of acetic acid; its taste is intensely bitter.

C. P.—It is composed of one eq. of acetic acid and one of morphia. Exposed to the air, it loses a portion of its acid, and then is partially insoluble in water; by heat it is decomposed, and dissipated without any residuum. Acetate of morphia is very soluble in water and in alcohol. When the base is not completely saturated with acid, its solution in water may be readily accomplished by adding a few drops of acetic acid.

Adulterations.—When the salt is properly prepared, it is of a snow-white colour, and readily soluble in water. The following test of the *Edin. Phar.* guards against the adulteration with any other white powder, as it indicates the exact quantity of morphia which ought to be present: "One hundred measures of a solution of gr. x. in f℥ss. of water, and min. v. of acetic acid, heated near to 212°, and decomposed by a faint excess of ammonia, yield by agitation a precipitate which in 24 hours occupies 15·5 measures of the liquid."

Th. E.—The uses and dose of this preparation are precisely similar to those of the muriate next to be described; the latter salt should be always preferred, as it is more easily prepared, keeps better, and is generally more pure.

Incomp.—The stronger acids; the alkalies, and alkaline earths; and most earthy and metallic salts.

Morphiæ murias, E. Morphiæ hydrochloras, L. *Muriate of Morphia; Hydrochlorate of Morphia.*

Prep.—*Lond.* "Take of opium, sliced, ℔j.; crystals of chloride of lead, ʒij., or a sufficiency; purified animal charcoal, ʒiiiss.; hydrochloric acid, distilled water, solution of ammonia, each, as much as may be sufficient; macerate the opium in Oiv. of distilled water for 30 hours, and bruise it; afterward digest it for 20 hours more and press it. Macerate what remains again and a third time in water, that it may become free from taste, and as often bruise and press it. Evaporate the mixed liquors, with a heat of 140°, to the consistence of a sirup. Then add Oiij. of distilled water, and when the impurities have subsided, pour off the supernatant liquor. Gradually add to this ʒij. of chloride of lead, or as much as may be sufficient, first dissolved in Oiv. of boiling distilled water, till nothing farther is precipitated. Pour off the liquor, and wash what remains frequently with distilled water. Then evaporate the mixed liquors as before, with a gentle heat, that crystals may be formed. Press these in a cloth, then dissolve them in a pint of distilled water, and digest with ʒiss. of animal charcoal, in a heat of 120°, and strain. Lastly, the charcoal being thoroughly washed, evaporate the liquors cautiously, that pure crystals may be produced. To the liquor poured off from the crystals first separated, previously mixed with a pint of water, gradually drop in as much solution of ammonia, frequently shaking it, as may be sufficient to precipitate all the morphia. To this, washed with distilled water, add hydrochloric acid, that it may be saturated; afterward digest it with ʒij. of animal charcoal, and strain. Lastly, the animal charcoal being thoroughly washed, evaporate the liquors cautiously, that pure crystals may be produced." *Edin.* "Take of opium, ʒxx.; water, Oviij.; muriate of lime, ʒi., or a slight excess; macerate the opium in fragments for 24 hours in Oij. of the water; and separate the infusion, squeezing well the residue. Repeat the maceration successively with Oij. more of the water, till the whole is made use of. Concentrate the whole infusions over the vapour-bath. Decant the clear liquid, and add the muriate of lime dissolved in f℥iv. of water. Set the whole aside to settle; pour off the liquid; wash the sediment with a little water, adding the washings to the liquid. Evaporate the liquid sufficiently in the vapour-bath for it to solidify on cooling. Subject the cooled mass to very strong pressure in a cloth; redissolve the cake in a sufficiency of warm distilled water; add a little fine powder of marble, and filter; acidulate the filtered fluid with a very little muriatic acid; and concentrate a second time in the vapour-bath for crystallization. Subject the crystals again to very strong pressure in a cloth. Repeat the process of solution, clarification by marble and muriatic acid, concentration and crystallization, until a snow-white mass be obtained. On the small scale trouble and loss are saved by decolorizing the solution of muriate of morphia by means of a little purified animal charcoal after crystallization. But on the large scale it is better to purify the salt by repeated crystallizations alone, and to treat all the expressed fluids, except the first, in the same way with the original solution of impure muriate of morphia. An additional quantity of salt may often be got from the first dark and resinous fluid ob-

tained by expression, on merely allowing it to remain at rest for a few months, when a little muriate of morphia may be deposited in an impure condition. The opium which yields the largest precipitate by carbonate of soda, according to the formula for testing opium, will yield muriate of morphia, not only in the greatest proportion, but likewise with the fewest crystallizations."

P. P.—Muriate of morphia is usually met with in the form of a fine, soft, snow-white powder, but it may be readily obtained in feathery, acicular crystals. It is without odour, but has an intensely bitter, peculiar taste.

C. P.—It is composed of one eq. of muriatic acid, one of morphia, and (in the crystalline state) six of water of crystallization. It is permanent in the air, is fusible by heat, and by a red heat is decomposed and totally dissipated. Muriate of morphia requires for its solution from 14 to 20 parts of cold water, but is soluble in less than its own weight of boiling water; it is also readily dissolved by alcohol.

Adulterations.—The only impurities which are at present commonly met with in this salt are colouring matter and moisture, both of which arise from faulty preparation. The tests of the *Edin. Phar.* guard against these contaminations, as well as against the adulteration with any similar white powder. "Snow-white; entirely soluble; solution colourless; loss of weight at 212° not above 13 per cent.; one hundred measures of a solution of gr. x. in f℥ss. of water, heated near to 212°, and decomposed with agitation by a faint excess of ammonia, yield a precipitate which in 24 hours occupies 12·5 measures of the liquid."

Th. E.—Notwithstanding the observations of many, that morphia is free from the stimulating effects of opium, and that it acts purely as an anodyne sedative, it would appear that it possesses essentially, though perhaps not quite identically, the actions of the drug itself. Thus, given in small doses, its first effect is to cause a feeling of excitement of the circulation, and in some persons, also, of the nervous system; this stage of excitement, however, is never so distinctly marked as when opium has been taken, and sedative effects are more immediately consequent on it. Morphia and its salts will, in some persons, but not so frequently as opium, produce the disagreeable subsequent feelings of nausea and headache caused by that drug; but constipation, sweating, or dryness of the tongue very rarely follow their employment. There are two effects produced by morphia or its salts, when taken in medicinal doses, which do not seem to be caused by opium, namely, a peculiar sensation of itchiness over the whole surface of the body, in some cases even attended with a cutaneous eruption, and irritability of the bladder, accompanied with a difficulty in voiding the urine; the latter symptom is most distinctly marked when any of the salts of morphia have been taken in full doses. The salts of morphia may be employed in most instances to fulfil the same intentions as opium and its preparations, and which will be fully considered in the next article. We prefer their use to that of opium where, from any cause, we wish to employ that drug without the knowledge of our patient; or where our intentions will be best answered by applying the rem-

edy to the denuded dermis, as in certain local affections, especially those of a nervous character. Like opium, the salts of morphia lose their effect by repetition, and, consequently, the dose must be gradually increased.

D. & M. OF ADM.—The dose of the muriate or acetate of morphia is from gr. $\frac{1}{4}$ to gr. ss.; after they have been employed for any length of time, so large a dose as gr. viij. to gr. x. will be required to act as a narcotic. When applied endermically, the cuticle is to be removed by means of a blister, and gr. j. to gr. ij. sprinkled over the denuded dermis.—*Morphiæ muriatis solutio*, E. (Muriate of morphia, ʒiss.; rectified spirit, fʒv.; distilled water, fʒxv.; mix the spirit and the water, and dissolve the muriate of morphia in the mixture with the aid of a gentle heat.) The strength of this preparation is intended to be equivalent to tincture of opium; fʒj. contains gr. ivss. of muriate of morphia. Dose, min. xx. to min. xl.—*Trochisci Morphiæ*, E. (Muriate of morphia, ℈j.; tincture of tolu, ʒss.; pure sugar, ʒxxv.; dissolve the muriate of morphia in a little hot water, mix it and the tincture of tolu with the sugar, and with a sufficiency of mucilage form a proper mass for making lozenges, each of which should weigh about fifteen grains.) Each lozenge contains a little more than a fortieth of a grain of muriate of morphia. Principally used to allay tickling cough in chronic pectoral affections. Dose, No. x. to xij., daily.—*Trochisci Morphiæ et Ipecacuanhæ*, E. (Muriate of morphia, ℈j.; ipecacuanha, in fine powder, ʒi.; tincture of tolu, fʒss.; pure sugar, ʒxxv.; proceed as for *morphia lozenges*.) Dose and uses the same. In addition to the morphia, each lozenge contains about a fourteenth of a grain of ipecacuanha.—*Sulphate of morphia* is sometimes used in medicine, but possesses no advantage over the muriate.

INCOMP.—Alkalies and alkaline earths, and most earthy and metallic salts.

OPIUM, D. L. E. *Opium. Concrete juice from the unripe capsules of Papaver somniferum.*—Probably originally a native of Asia, Egypt, and the South of Europe, but now growing wild and extensively cultivated in most parts of the world; it belongs to the natural family *Papaveraceæ*, and to the Linnæan class and order *Polyandria Monogynia*.

B. C.—Annual; stem erect, cylindrical, branched, glaucous green, 2 to 6 feet high; leaves amplexicaul, alternate, undulated, incised, ovato-oblong, glaucous beneath; flowers large, terminal, pendulous before expansion, with two deciduous sepals, and four petals, generally white with a purple eye, some varieties red or dark purple; capsules obovate or globose, smooth, many-seeded; seeds small, roundish or reniform, oily.

PREP.—Opium is obtained from the capsules of the poppy by a nearly similar process in all parts of the world in which it is prepared: A few days after the petals fall off, incisions are made horizontally and obliquely with some sharp instrument through the epicarp and sarcocarp of the capsule, taking care not to penetrate the cavity. A white milky juice exudes in drops, which is allowed to remain on the poppy head for 24 hours. It is then scraped off and deposited in earthen or wooden vessels, in which it is assiduously stirred until the different collections made are thoroughly inspissated, water being sometimes added to keep up the moisture. The opium is finally dried without heat, first in small cakes, afterward in large masses, and in most places wrapped in poppy leaves, to prevent them from adhering.

P. P.—The opium met with most commonly, at present almost entirely, in British commerce, is called Turkey Opium, and is principally brought from Smyrna, a small quantity occasionally coming direct from Constantinople. Smyrna Opium occurs in irregularly-rounded lumps, varying in weight from a few ounces to two or even three pounds, the most general size being from a pound and a half to two pounds. When first imported it is usually so soft as to be readily imprinted with the fingers, but it quickly becomes hard by keeping. Each lump is covered externally with the reddish winged seeds of some species of *Rumex*, and sometimes also with poppy leaves; it is of a brownish colour, and has a waxy lustre when cut; its odour is strong and narcotic, and its taste bitter, acrid, and nauseous. Constantinople Opium occurs in small flattened cakes covered with a poppy leaf, but without any *Rumex* seeds. It is hard, and of a hair-brown colour; its odour and taste are more feeble than the preceding sort. Egyptian Opium is also sometimes met with in the British market, but within these last few years it has been very scarce. It occurs in flattened round cakes, from 3 to 8 ounces in weight, each cake being wrapped up in a poppy leaf, with the midrib of which it is indented; it varies much in consistency, some pieces being very soft and others tolerably hard; but most of it attracts moisture from the air, so as to become soft by keeping. It has a reddish-brown colour; its odour and taste are comparatively feeble. East Indian Opium is not an article of British commerce, being prepared chiefly for the Chinese market. For specimens of the different sorts usually prepared, I am indebted to the kindness of Professor Christison, of Edinburgh, and to my friend Mr. Johnson, late assistant opium inspector at the great factory of Behar. Three kinds are commonly met with: Bengal Opium, which includes that prepared at the factories of Behar and Benares, Garden Patna and Malwah Opium. *Bengal Opium* is met with in large round balls from three to four pounds' weight, surrounded with a thick envelope of leaves firmly agglutinated together. The contained opium is quite soft, and of a blackish colour; its odour and taste are purely opiate. *Garden Patna Opium* occurs in flat, square cakes from three to four inches square, and about half an inch thick; while still soft, it is closely enveloped in thin plates of mica, which firmly adhere to it. It has a reddish-brown colour, homogeneous throughout, and a rather agreeable, strongly opiate odour. *Malwah Opium* is in flattened, round cakes, five or six inches in diameter; it is hard and brittle, covered externally with a coarse grayish dust; internally it is of a light-brown colour, and has a shining fracture; its odour is much more feeble than that of Garden Patna opium. Opium was also formerly prepared in England of very fine quality, but owing to the losses which were sustained from the uncertainty of the climate, the cultivation of the poppy with that intention is now quite abandoned. It is at present prepared in some parts of France and of Germany, for the purpose of procuring morphia from it. A variety of opium, under the name of *Persian Opium*, is described as having been im-

ported a few years since from Trebizon on the Black Sea; it was in cylindrical sticks about six inches long, and half an inch in diameter, wrapped separately in paper; it was of a pale brown colour, had an opiate, somewhat musty odour, and an intensely bitter taste; it appeared to be a very inferior article. Of the different varieties of opium above described, the finer qualities of Turkey opium should be preferred for medicinal purposes.

C. P.—According to the most recent, as well as the most complete analyses that have been made of opium, the substances of which it is composed appear to be the following: *Morphia, narcotina, codeia, thebaina* or *paramorphia, narcein, meconin, meconic acid, sulphuric acid, gum, albumen, resin, fixed oil, a trace of volatile oil, its odorous principle, lignin, caoutchouc, extractive matter, and numerous salts of inorganic bases.* The first seven are peculiar principles found only in opium; they may be conveniently classed as follows, with respect to both their chemical and physiological properties:

1. Alkaloids

Substance.	Medicinal Property
Morphia ($C^{35}H^{20}O^{6}N$)	Narcotic.
Codeia ($C^{35}H^{20}O^{5}N$)	Narcotic.
Narcotina ($C^{48}H^{24}O^{15}N$)	Bitter; resembling Quinia.
Thebaina ($C^{25}H^{14}O^{3}N$)	Stimulant; resembling Strychnia.

2. Neutrals.

Narcein ($C^{28}H^{20}O^{12}N$)	Inert.
Meconin ($C^{10}H^{5}O^{4}$)	Inert.

3. Acid.

Meconic Acid ($C^{14}HO^{11}$)	Inert.

The constituents of opium are partially soluble in water, either warm or cold, about a third being left undissolved, which consists chiefly of a dark viscid substance, resembling caoutchouc, and narcotin; it is more soluble in alcohol and ether, but a small portion is still left undissolved. The watery infusion is of a dark-brown colour, and has an acid reaction. It is precipitated by the alkalies, and alkaline earths when not added in excess; by the soluble salts of iron and of lead, by the salts of lime and magnesia, by tincture of galls, and by all astringent vegetable substances. Of the different substances above enumerated as existing in opium, the only one of importance in relation to medicine is *morphia*, which has been before described; it exists in opium combined with meconic and sulphuric acids. *Codeia* has been used in France by Magendie and others as a narcotic; it is about half the strength of morphia. *Narcotina* was originally generally believed to be the stimulating principle of opium; but more recent investigations, especially those of Dr. O'Shaughnessy, of Calcutta, have shown that it is completely devoid of any stimulant or narcotic properties, and that, like quinia, it is capable of arresting the paroxysms of remittent and intermittent fevers; more than 160 cases of ague successfully treated with narcotina by himself and others have been recently published by that physician. *Thebaina*, from Magendie's experiments, appears

to be a powerful poison; one grain injected into the jugular vein or placed in the pleura, acts like strychnia, causing tetanus and death in a few minutes. *Meconic acid* produces a deep cherry-red colour with the persalts of iron; and this forms the most important characteristic of opium in medico-legal researches.

Adulterations.—Opium is very extensively adulterated, and also varies exceedingly in quality, from the mode in which it is prepared. Many of the impurities which exist in opium may be detected by a careful physical examination; such as moisture, sand, stones, leaves, woody fibre, pieces of metal, seeds, &c. But, by the external characters, it is very difficult to judge accurately of the quality of opium, and the only sure criterion is to ascertain the quantity of morphia contained in a given specimen of the drug. This can only be done accurately by proceeding according to either of the processes given for the preparation of the muriate of morphia. "A pound of good opium thus treated should yield at least ten per cent. of snow-white salt" (Christison). The following test for the goodness of opium given in the Edinburgh Pharmacopœia is intended to indicate the quantity of morphia, narcotine, and resinous extractive contained; but it is difficult of application, and at best can only be a doubtful criterion of quality: "A solution from 100 grains of fine opium macerated 24 hours in f℥ij. of water, filtered and strongly squeezed in a cloth, if treated with a cold solution of ʒss. of carbonate of soda in two waters, yields a precipitate which weighs when dry at least ten grains, and dissolves entirely in solution of oxalic acid."

Th. E.—In excessive doses, opium is a powerful narcotic poison, producing soon after it is taken giddiness and stupor, with scarcely any previous excitement; the stupor increases rapidly, accompanied with complete torpor, slowness of breathing, depressed circulation, general relaxation of the muscles, contracted pupils, and, unless active treatment be speedily employed, death quickly ensues. In medicinal doses, opium generally produces at first excitement of the vascular system, which is accompanied with exhilaration of the nervous functions; these effects are marked by an increase in the force and frequency of the pulse, with increased heat of the body, and by the pleasurable sensations which are experienced throughout the whole system. Soon after, unless the dose be repeated, the sedative influence of the drug becomes obvious; the general excitement is calmed, pain is diminished, a disinclination to muscular exertion produced, and the force of external impressions on the senses diminished; this state is succeeded by sleep more or less profound, which lasts usually from six to eight hours. On awaking from the sleep produced by opium, nausea, headache, loss of appetite, and indisposition to any active exertion are very generally experienced. The effects of opium are modified by a variety of circumstances, but most remarkably of all by habit. This is well exemplified by a reference to the customs of some Eastern countries, as Turkey, Persia, and China, where the drug is commonly employed to produce a species of intoxication or excitement. In the two former countries the opium is eaten, in

the latter it is smoked, but in either way the quantity used must be daily increased, or it ceases to produce the desired effect. Instances of opium-eating constantly occur also in the British Islands; and a graphic account of the effects produced by this pernicious habit, as experienced by himself, is given by Mr. de Quincy in his *Confessions of an English Opium-eater*. Among the Turks, the *Theriaci* (opium-eaters) generally begin with doses of from one to two or three grains, and gradually increase the quantity till it amounts to two, three, or in many instances to six drachms. In Great Britain, also, it is taken in immense quantities by opium-eaters, f℥iij. of laudanum being a common daily allowance, and in some instances, where the vice has been long indulged in, half a pint to a pint is the quantity taken. These facts should be borne in mind by the medical practitioner, as opium-eaters, when labouring under disease, require, of course, very large doses of the drug; and in all individuals where the use of opium has been continued for any length of time, the dose must be gradually increased. We also meet with individuals on whom, although unaccustomed to its use, opium produces but little effect. Christison mentions an instance of "a gentleman of his acquaintance who, though not accustomed to its use, has taken 450 drops of the best laudanum without any other effect than some headache and constipation; and, singularly enough, his son, at the age of six, took 60 minims of solution of muriate of morphia without any apparent effect." In others, we see a very opposite state of sensibility to the operation of this drug, the sixth or eighth of a grain being a sufficient dose; this extreme sensibility to the action of opium is always met with in infants and young children; we should, therefore, employ opiates with great caution in the treatment of their diseases, one drop of laudanum frequently proving a dangerous dose to a child a few weeks old. The effects of opium are also much influenced by disease, as will be evident when we come to speak of the special uses of the drug. Lastly, by combination with other remedies, the operation of opium is greatly modified. Thus, with antimonials or ipecacuanha, its narcotic influence is much diminished, and the diaphoretic powers of those substances remarkably increased; with astringents, as catechu, kino, or chalk, their powers are augmented without the production of narcotism; and with aromatics or camphor, the stimulant effect of the drug is generally only manifested.

The special uses of opium in the treatment of disease are so very numerous, that we can only subjoin a concise account of the most important of them, mentioning the peculiar circumstances by which its employment is demanded or contra-indicated. In *fevers*, opium is principally used to procure sleep where there is great watchfulness or delirium present, without excitement of the vascular system, or where they continue after that excitement has been subdued by antiphlogistic treatment. Its use, however, must be attended with great caution, and should not be persisted in if the tongue and skin become dry, or if the pupil of the eye is contracted. The combination of tartar emetic with opium, as first propo-

sed by Dr. Graves, of Dublin, will be often found particularly useful in fevers attended with much cerebral disturbance. In the *eruptive fevers*, opium, when given with due attention to the concomitant symptoms, is productive of much benefit, nay, is sometimes imperatively demanded for the safety of the patient; about the eighth or ninth day of the eruption in smallpox, great cerebral disturbance frequently comes on, at first marked by throbbing of the carotids; if opium be not administered immediately on the appearance of this symptom, it is quickly followed by delirium, coma, and death. In *intermittent fever*, opium given in a large dose at the commencement of the cold stage frequently arrests the paroxysm; if there be any local inflammation or congestion present, its use is contra-indicated. In *inflammatory diseases*, given in conjunction with calomel, it acts as a powerful antiphlogistic; one grain of opium with two or three of calomel administered every four or five hours, will be often found a remedy of much power in the inflammations of *membranous* parts; it does not, however, prove useful in the inflammation of the *parenchymatous structure* of organs. In *diffuse inflammation*, particularly that fatal form of it which is accompanied with *periostitis*, opium proves more successful than any other remedy which has been employed; it is best given alone, in doses of from a quarter of a grain to half a grain every hour or every second hour. Its beneficial influence in this affection depends upon its power of lessening "irritability," and thereby enabling the system to bear up against the disease. After a copious bleeding, at the very commencement of an acute attack of *gastritis*, *enteritis*, *peritonitis*, *cystitis*, &c., a full opiate, 60 to 80 drops of the tincture, or to 2 or 3 grains of solid opium, will often arrest the farther progress of the disease. In *peritonitis*, caused by rupture of the stomach or intestinal canal, life can only be prolonged for even a short period by the use of very large doses of opium. In *rupture of the uterus*, given immediately and freely, opium has in some instances saved the life of the patient. In *acute rheumatism*, when given as first proposed by my colleague, Dr. Corrigan, it is productive of the happiest results; to prove useful in this disease it must, however, be administered freely, one grain at first every second hour, and after a few doses every hour, and this treatment continued for five or six days, or until the disease is subdued; thus given, it does not cause either dryness of the tongue, headache, or constipation; the duration of the attack is shortened, and the dangerous complications of endocarditis and pericarditis prevented. In the early stages of *acute dysentery*, opium, given in full and frequently-repeated doses, will be found, in general, to check the disease; the same may be also stated of *diarrhœa* and *common cholera*. To allay the pain of *gout* and *chronic rheumatism*, it is given in full doses with much advantage. In *delirium tremens*, opium is the remedy on which most reliance is to be placed; to prove beneficial, it should be employed in very large doses frequently repeated; thus, two or three grains of solid opium must be administered every third or fourth hour. The combination of tar-

tar emetic with the opium as proposed by Professor Law, of Dublin, will be generally found productive of benefit in cases of delirium tremens where opium alone fails to do good. It is more beneficial in *hydrophobia* and *tetanus* than any other agent which has yet been employed; in those diseases there is a remarkable insensibility to the action of the drug, so that it must be given in enormous doses to procure any good result. In *spasmodic* and *convulsive* diseases, opium is also a highly important remedy; as in spasm of the ureter, or gall-duct from the passage of calculi, in spasmodic stricture, in colic, &c. In all the varieties of neuralgia or other painful affections; in the nervous irritability which follows large losses of blood; in senile gangrene; in cancer; in painful ulcerations; in poisoning with acrid or corrosive substances, &c., opium is very generally employed as a palliative and anodyne. It is also found a most useful adjunct to animal diet in the treatment of *diabetes*. And, lastly, in *venereal diseases* it is combined with mercurials to prevent them from running off by the bowels. *Externally*, opium is used in the form of infusion, liniment, or plaster; the uses of the two latter will be described among the pharmaceutical preparations of the drug. The infusion is applied to recent burns, or inflammations of the skin from other causes; gr. xij. each of powdered opium and of acetate of lead, infused separately in f℥iv. of tepid water mixed and filtered, form an excellent lotion in those cases, and also in erythema and erysipelas. In *chronic ophthalmia*, or where the inflammation is of a subacute character from the commencement, the wine of opium dropped into the eye is found an excellent remedy. Suppositories of opium are introduced into the rectum in painful or spasmodic affections of the neighbouring viscera.

D. & M. OF ADM.—In powder, gr. ss. to gr. iij. or gr. iv., usually given in the form of pill, which may be made with simple mucilage, or, if they are to be kept for any time, conserve of roses.—*Extractum Opii aquosum*, D. *Ext. Opii purificatum*, L. *Extractum Opii*, E. ("Opium, sliced, ℥ij.; boiling water, *by measure*, ℔j.; triturate the opium with the water for 10 minutes, and after a short interval pour off the liquor; triturate the residual opium with an equal quantity of boiling water, and for the same time, pouring off the liquor as before; repeat the process a third time; mix the liquors, and expose the mixture to the air for two days in an open vessel. Lastly, strain through linen, and prepare an extract with slow evaporation," D. "Opium, sliced, ℥xx.; boiling distilled water, cong. j.; add a little water to the opium, and macerate for 12 hours, that it may soften; then the remaining water being poured in gradually, rub them until they are very well mixed, and set by, that the dregs may subside; afterward strain the liquor, and evaporate to a proper consistence," L. "Opium, ℔j.; water, Ov.; cut the opium into small fragments, macerate it for 24 hours in a pint of water, break down the fragments with the hand, express the liquid with pretty strong pressure; break down the residuum again in another pint of water, let it macerate for 24 hours, and

express the liquid; repeat the maceration and expression in the same way till the water is all used. Filter the successive infusions as they are made, passing them through the same filter; unite and evaporate them in the vapour-bath to the proper consistence," E.) A very bad preparation, and one which should be expunged from the pharmacopœias; during the prolonged evaporation, the morphia forms a very insoluble compound with the resinoid matter of the opium, which, of course, must tend to lessen the activity of the drug. It is administered in the same doses as the powder.—*Pilulæ Opii sive Thebaicæ*, E. (Opium, 1 part; sulphate of potash, 3 parts; conserve of red roses, 1 part; beat them into a proper mass, and divide into five-grain pills.) Each pill contains gr. j. of opium. Dose, one to three pills. The sulphate of potash is merely used as a mechanical agent, to divide the opium.—*Pilulæ Saponis cum Opio*, D. *Pil. saponis comp.*, L. (Turkey (hard, L.) opium (powdered, L.), ʒss.; hard soap, ʒij.; beat them together until they are incorporated.) Five grains contain one grain of opium. Dose, gr. iij. to gr. x.—*Pilulæ e Styrace*, D. *Pil. Styracis*, E. *Pil. Styracis comp.*, L. (Storax (purified, L.; the extract, E.), ʒiij. (2 parts, E.); opium (Turkey, D.; hard, in powder, L.), saffron, of each, ʒi. (1 part, E.); beat them into a uniform mass, "and divide into four-grain pills," E.) Every five (four, E.) grains contain one grain of opium. The storax and saffron completely conceal the odour and taste of the opium, and the name enables us to prescribe that drug without the knowledge of our patient.—*Confectio Opii*, D. L. *Electuarium Opii*, E. ("Hard opium, powdered, ʒvj.; long pepper, ʒi.; ginger, ʒij.; caraway seeds, ʒiij.; tragacanth, powdered, ʒii.; sirup, ℔i. (fʒxvi., L.)," D. L. "Rub the opium with the sirup previously heated; then add the other ingredients in powder, and mix," D. "Rub the dry ingredients together to a very fine powder, and keep it in a close vessel; and whenever the confection is to be used, add the sirup when hot, and mix," L. "Aromatic powder, ʒvj.; seneka, in fine powder, ʒiij.; opium, diffused in a little sherry, ʒss.; sirup of ginger, ℔j.; mix them together, and beat them into an electuary," E.) About 25 grains (36 grains, L.; 43 grains, E.) contain gr. j. of opium. It is an aromatic and anodyne compound, chiefly used as an addition to chalk mixture in diarrhœa. Dose, gr. x. to ʒj.—*Trochisci Opii*, E. (Opium, ʒij.; tincture of tolu, ʒss.; sirup, fʒviij.; powder of gum-arabic and extract of liquorice, softened with boiling water, of each, ʒv.; reduce the opium to a fluid extract by the formula for *Extractum Opii*, mix it intimately with the liquorice, previously reduced to the consistence of treacle; add the tincture, sprinkle the gum and sugar into the mixture, and beat it into a proper mass, which is to be divided into lozenges of ten grains.) Seven lozenges contain about gr. j. of opium; they are principally employed to allay troublesome cough.—*Tinctura Opii*, D. L. E. ("Turkey (hard, L.) opium, powdered (coarsely, D.), ʒx. (ʒiij., L.); proof spirit, *by measure*, ℔j. (Oij., L.); macerate for 14 days, and filter," D. L. "Opium, sliced, ʒiij.; rectified spirit, Oj. or fʒvij.;

water, f℥xiiiss.; digest the opium in the water at a temperature near 212° for two hours, break down the opium with the hand, strain and express the infusion, macerate the residuum in the spirit for about 20 hours, and then strain and express very strongly, mix the watery and spirituous infusions, and filter. This tincture is not so easily obtained by percolation, but when the opium is of fine quality, it may be prepared thus: slice the opium finely, mix the spirit and water, let the opium macerate in f℥xiv. of the mixture for 12 hours, and then break it down thoroughly with the hand, pour the whole fluid and pulpy mass into a percolator, and let the fluid part pass through, add the rest of the spirit without packing the opium in the cylinder, and continue the process till Oij. are obtained," E.) The tincture of opium, *laudanum*, of the three pharmacopœias is about the same strength; according to Christison, min. xiiiss., or about 25 drops, contain the active part of one grain of opium. It is the most generally employed of the preparations of opium, the spirituous menstruum dissolving all the active principles of the drug, and enabling us to apportion our doses with great accuracy. Dose, min. x. to min. xxx.—*Tinctura Opii Camphorata*, D. E. *Tinct. Camphoræ comp.*, L. *Paregoric Elixir.* ("Turkey (hard, L.) opium, powdered; benzoïc acid, of each, ʒj. (gr. lxxij., L.); camphor, ℈ij. (℈iiss., L.); oil of anise, fʒi.; proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 14 days, and filter," D. L. "Opium, sliced, and benzoïc acid, of each, ℈iv.; camphor, ℈iiss.; anise oil, fʒj.; proof spirit, Oij.; digest for seven days, and filter," E.) The name adopted by the London College for this preparation is the most convenient, as enabling us to prescribe opium without the knowledge of our patient; it also serves to distinguish it better from the simple tincture, and thus prevent errors in dispensing. According to Christison, the active matter of one grain of opium is contained in 267 minims or about 500 drops of the preparation of the Dublin and London Pharmacopœias, and in 240 minims or about 450 drops of that of Edin. It is very much employed as an anodyne in pectoral affections unaccompanied with inflammation. Dose, fʒj. to fʒiij.—*Acetum Opii*, D. E. (Opium (Turkey, D.), ℥iv.; distilled vinegar, f℥xv.; triturate the opium (cut into small fragments, E.) into a pulp with a little of the vinegar, then add the remainder of the vinegar, macerate in a close vessel for 7 days, frequently agitating, then pour off the supernatant liquor (strain and express strongly, E.), and filter.) This preparation of opium is preferred by many to laudanum, as being less apt to occasion the disagreeable subsequent effects of the drug. According to Montgomery, twenty drops are equivalent to thirty of the common tincture of opium. Dose, min. viij. to min. xxv.—*Tinctura Opii Ammoniata*, E. (Benzoïc acid, and saffron, chopped, of each, ʒiij.; opium, sliced, ʒij.; anise oil, ʒss.; spirit of ammonia, Oj.; digest 7 days, and filter.) This preparation is called in Scotland *Scotch Paregoric;* it is used as an anodyne and antispasmodic. The active matter of one grain of opium is contained in 80 minims or about 150 drops (Christison). Dose, fʒss. to fʒij.—*Vinum Opii*, D. L. E. (Opium

(purified extract of opium, L.), ʒj. (ʒiiss., L.; ʒiij., E.); cinnamon, bruised (in moderately fine powder, E.), and cloves, bruised, of each, ʒj. (ʒiiss., L. E.); sherry wine, ℔j. (Oij., L. E.); macerate (digest, E.) for 8 (14, L.; 7, E.) days, and filter.) This preparation is more agreeable both in smell and taste than laudanum; it is, however, seldom employed internally, being chiefly used as an application to the eye in chronic ophthalmia. The active matter of one grain of opium is contained in min. xvij. of the Dublin wine, in a trifle more of the Edinburgh, and in min. x. of the London. Dose, for internal use, min. x. to fʒj.—*Enema Opii*, D. L. E. ("Tincture of opium, ʒi.; tepid water, ʒvi.; mix," D. "Decoction of starch, fʒiv.; tincture of opium, min. xxx.; mix," L. "Starch, ʒss.; tincture of opium, fʒss. to fʒi.; water, fʒij.; boil the starch in the water, and when it is cool enough for use add the tincture of opium," E.) Used as an anodyne in irritable states of the bowels; the bulk of the Dublin preparation is too great, as the smaller quantity of fluid is less likely to be expelled; starch is also a better vehicle than water. On the Continent it is generally stated that opium acts much more energetically when administered in the form of enema than when given by the mouth; but the contrary opinion is held by British practitioners, who generally employ three or four times the quantity when administered by the rectum.—*Linimentum Opii*, L. E. *Lin. Saponis cum Opio*, D. ("Soap liniment, *by measure*, 4 parts (fʒvi., L.); tincture of opium, 3 parts (fʒij., L.); mix," D. L. "Castile soap, ʒvj.; opium, ʒiss.; camphor, ʒiij.; oil of rosemary, fʒvj.; rectified spirit, Oij.; macerate the soap and opium in the spirit for three days, filter, add the oil and camphor, and agitate briskly," E.) *Anodyne liniment*, used as an embrocation in rheumatic pains, neuralgia, &c.—*Emplastrum Opii*, D. L. E. (Opium (hard, L.), in powder, ʒss.; Burgundy pitch (resin of the spruce fir, L.), ʒiij.; litharge (lead, D.) plaster, ℔i.; (water, fʒviij., L.); "melt the plaster, add the pitch and opium by degrees, and mix them thoroughly," D. E. "Add the resin, opium, and water to the melted plaster, and, with a slow fire, boil down until all unite into a proper consistence," L.) This plaster contains about a thirtieth part of opium. It is used as an anodyne application in local pains.—*Black Drop.* (Opium, sliced, ℔ss.; expressed juice of the wild crab, Oiij.; nutmegs, ʒiss.; saffron, ʒss.: boil to a proper consistence, then add, of pure sugar, ʒiv.; yeast, two spoonfuls; set the whole in a warm place near the fire for six or eight weeks, then place it in the open air until it becomes a sirup; and, lastly, decant, filter, and bottle it, adding a little sugar to each bottle.) This preparation resembles the officinal *Acetum Opii;* it is highly prized by many practitioners, and is said not to produce the disagreeable subsequent effects of most of the other preparations of the drug. It is more than twice the strength of laudanum. [U. S. P.—Take of opium, in coarse powder, 8 oz.: nutmeg, in like condition, 1½ oz.; saffron, ½ oz.; sugar, 12 oz.; distilled vinegar, q. s. Digest the opium, nutmeg, and saffron with 1½ pints of distilled vinegar on a sand-bath, with gentle heat, for 48 hours, and strain. Digest the

residue with an equal quantity of distilled vinegar in the same manner for 24 hours. Then put the whole into an apparatus for displacement, and return the filtered liquor as it passes until it comes away quite clear. When the filtration ceases, pour distilled vinegar gradually upon the materials remaining in the instrument until the whole quantity of filtered liquor equals 3 pints. Lastly, add the sugar, and by a water-bath evaporate to 3 pints and 4 fluid ounces. Diluted acetic acid may be used instead of the distilled vinegar.]—*Liquor Opii Sedativus.* (Mode of preparation not known; supposed to be a concentrated infusion of opium.) It is about the same strength as laudanum, than which it is said to be less stimulating.

Incomp.—The alkalies and lime-water, unless they are added in excess; the carbonates of the alkalies; acetate and diacetate of lead; sulphates of iron and zinc; arsenite of potash; and all astringent vegetable preparations.

In cases of poisoning with opium, we should immediately have recourse to the use of the stomach pump and stimulating emetics; to external stimulants, such as cold affusion, loud talking, compelled exertion, as forcing the patient to walk between two assistants, the application of ammonia or strong acetic acid to the nostrils, &c.; to internal stimulants, the best of which are brandy, ammonia and its carbonate, strong coffee, camphor, and musk; and if all other remedies fail, artificial respiration and galvanic shocks should be had recourse to, the assiduous application of which has in some almost hopeless cases restored life; in one instance on record, artificial respiration was kept up for nearly three hours.

Papaver, L. E. Papaver somniferum, D. *Poppy-heads. The ripe* (*not quite ripe*, E.) *capsules of Papaver somniferum.*—This plant has been described in the last article; the heads are most active when gathered before they are ripe, as directed by the Edinburgh College; they are dried in the sun.

P. P.—They are globular, about the size of an apple, crowned with the persistent, many-rayed stigma; their structure is thin and fragile; they have a feeble, narcotic odour, and a weak, somewhat bitter taste. They contain many bland seeds, which yield by expression a yellowish fixed oil.

C. P.—Poppy-heads contain a very minute proportion of the different substances found in opium, with a large quantity of woody fibre. They yield their virtues to boiling water.

Th. E.—Any medicinal virtues which poppy-heads possess depend on the presence of a small quantity of opium, consequently they are apt to vary much in strength. They are chiefly used in the form of decoction, as a fomentation to inflamed or painful parts. The following officinal preparations are sometimes used internally as substitutes for opium: *Extractum Papaveris*, L. E. (Poppy-heads without seeds (bruised, L.), ʒxv.; boiling water (distilled, L.), cong. j.; macerate for 24 hours, then boil down to 4 pints, strain the liquor (while hot, L.), and evaporate (in the vapour-bath,

E.) to the due consistence.) Its effects are somewhat similar to those of opium; it is but rarely used. Dose, gr. ij. to xx.—*Sirupus Papaveris* (*somniferi*, D.), D. L. E. (Poppy-heads (without the seeds, E.; and bruised, D.), ʒxvij. (℔iij., L.; ℔iss., E.); boiling water, cong. ij. (cong. v., L.; Oxv., E.). "Macerate for 24 hours in the water, then boil down to cong. j. in a water-bath and express strongly, reduce the strained liquor to ℔ij., and strain while hot. Set aside for 12 hours that the fæces may subside, boil down the clear liquor to ℔j., and make into a sirup," D. "Boil down the capsules in the water to cong. ij., and press strongly; boil down the strained liquor again to Oiv., and strain while hot; set it by for 12 hours that the dregs may subside, then boil down the clear liquor to Oij.; add ℔v. of sugar, and dissolve it," L. "Slice the poppy-heads and infuse them for 12 hours in the water, boil down to Ov., strain and express strongly through calico; boil again to Oiiss., then add ℔iij. of sugar, and dissolve it with the aid of heat," E.) Sirup of poppies is usually employed as a narcotic in infantile diseases; it should be administered to infants and children with great caution, as Dr. Montgomery states that in more than one instance a teaspoonful has proved fatal to a healthy infant; this care is particularly requisite, as a preparation made by adding laudanum to simple sirup is frequently substituted for the true sirup. Dose, for infants and children, f3ss. to f3ij.; for adults, fʒss. to fʒj.—*Decoctum Papaveris*, D. L. E. (Poppy-heads, sliced, ʒiv.; water, *by measure*, ℔ij. (Oiv., L.; Oiij., E.); boil for a quarter of an hour, and strain.) For external use only.

Rhœas, L. Rhœados petala, E. Papaver rhœas, petala, D.—*The petals of the Red or Corn-poppy.*—Indigenous, belonging to the natural family *Papaveraceæ*, and to the Linnæan class and order *Polyandria Monogynia.*

B. C.—A slender annual, 2 to 3 feet high; stem bristly, many-flowered, its bristles and those of the flower stalks spreading; leaves pinnatifid; flowers with broad, deep scarlet petals; capsules glabrous, nearly globose.

P. & C. P.—The petals should be collected immediately after their expansion, as they drop off easily; they should be dried quickly, so as to preserve their colour. In the recent state, red poppy petals are of a rich scarlet colour, which becomes darker by drying; they have a feeble odour of opium, and a slightly bitter taste. They consist of vegetable albumen, red colouring matter, astringent matter, soft resin, wax, gum, and some salts (Beetz and Ludurg). It is probable that they also contain a trace of morphia. They yield their colouring matter and other principles to boiling water.

Th. E.—The petals of the red poppy possess, probably, some feeble narcotic properties, but they are only used in medicine in the form of sirup, as colouring ingredients, in consequence of their fine rich colours.—*Sirupus* (*Papaveris*, D.) *Rhœados*, D. L. E. ("Fresh petals of the red poppy, ℔j.; boiling water, *by measure*, ʒxx.; add the petals gradually to the boiling water, remove the vessel from the fire, and macerate with a low heat for 12 hours,

then express the liquor and set it aside, that the dregs may subside; finally, add sugar, and form a sirup," D. "Red poppy (petals), ℔j.; boiling water, Oj.; pure sugar, ℔iiss.; add the petals gradually to the water heated in a water-bath, stirring occasionally; then, the vessel being removed from the bath, macerate for 12 hours; then (strain, E.) press out the liquor, and (when the dregs have subsided, L.) add the sugar and dissolve it," L. E.) This sirup does not keep well.

STRAMONIUM, D. E. STRAMONII FOLIA [U. S. P.] ET SEMINA, L. *Stramonium. Thorn-apple. The herb*, E.—*the herb and seeds*, D. —*the leaves and seeds*, L.—*of Datura stramonium.*—Indigenous, belonging to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—An herbaceous annual; stem much branched, forked, spreading, leafy; leaves ovate, angulato-sinuate, glabrous; flowers axillary, large, erect, white; fruit an ovate capsule, erect, clothed with numerous nearly equal spines, 4-celled at the base, 2-celled at the summit, many-seeded.

P. P.—The whole herb should be collected when the plant is in flower, and carefully dried according to the directions of the London College. The leaves should be removed from the stem and branches, which are to be rejected. The seeds, when fully ripe, are black, and should then be gathered. As usually met with, the dried herb is chopped into small pieces of a greenish-white colour; it has a feeble, narcotic odour (which in the fresh state is strong and heavy), and a bitter, nauseous taste. The seeds are small, kidney-shaped, and rough; when bruised they have the same odour as the herb; their taste is nauseous and bitter.

C. P.—The seeds contain fixed oil, wax, resin, extractive, gummy matter, malic acid, some salts, and a peculiar alkaloid, first discovered by Brandes, and named by him *Daturia*, but which has been since shown by Runge to be identical with *Atropia* (see pages 221 and 222). It is on this principle that the medicinal properties of stramonium depend; it exists also in the leaves. Both herb and seeds yield their virtues to water and to alcohol; but their activity is much impaired by long boiling, as in preparing the watery extract.

TH. E.—Stramonium leaves and seeds act as powerful narcotics, in large doses proving fatal, with all the symptoms of narcotic poisoning. In medicinal doses, as might be expected from the identity of their active principles, they produce effects nearly similar to those of belladonna and henbane, and have, consequently, been used with the same intention in the treatment of disease. In neuralgic affections, as *tic douloureux* and *sciatica*, in chronic rheumatism, and in all forms of chronic disease attended with acute pain, administered in small doses frequently repeated until its narcotic influence is manifested, stramonium is a remedy of great power, lessening almost immediately sensibility and pain. The inhalation of the vapour of the cut herb, when burned, is frequently found of much service in the treatment of spasmodic asthma; it is used with

a common pipe in the same way as tobacco. The smoking of stramonium, however, should be employed with great caution, and used only in very small quantities at a time, as in many instances it has produced dangerous symptoms; and it should never be prescribed for very old persons, or in cases where there is a tendency to apoplexy or to paralysis.

D. & M. OF ADM.—Of the powder of the herb or leaves, gr. j. to gr. iv.; of the seeds, gr. $\frac{1}{4}$ to gr. j., gradually increased until some obvious effect is produced. For smoking, gr. x. to gr. xx. of the chopped herb may be used.—*Extractum Stramonii*, D. L. E. ("Stramonium seeds, ℔j. (℥xv., L.); boiling (distilled, L.) water, cong. j.; digest (macerate, L.) for 4 hours in a vessel lightly covered (near the fire, L.), then take out the seeds, bruise them in an earthen mortar, and, when bruised, return them to the liquor; then boil down to ℔iv. (Oiv., L.); strain the liquor (while hot, L.), and evaporate to a proper consistence," D. L. "Take of stramonium seeds any convenient quantity, grind them well in a coffee-mill, rub the powder into a thick mass with proof spirit, put the pulp into a percolator, and transmit proof spirit till it passes colourless; distil off the spirit, and evaporate what remains in the vapour-bath to a proper consistence," E.) Prepared according to the Edinburgh Pharmacopœia, this extract is the best, being more certain as well as more active. Dose, gr. $\frac{1}{4}$, gradually increased.—*Tinctura Stramonii*, U. S. (Stramonium seeds, bruised, ℥iv.; proof spirit, ℥xxxij.; macerate for 14 days, and filter through paper.) An excellent preparation. Dose, min. x. to min. xxx.

INCOMP.—The caustic alkalies; acetate of lead; and nitrate of silver.

In poisoning with stramonium, the same treatment should be employed as in poisoning with belladonna.

TOXICODENDRON, L. RHUS TOXICODENDRON, FOLIA, D. *Sumach or poison-oak leaves; the leaves of Rhus toxicodendron.*—A native of North America, belonging to the natural family *Anacardiaceæ*, and to the Linnæan class and order *Pentandria Trigynia.*

B. C.—A small shrub; stems numerous, branching; leaves pinnate, trifoliate; flowers greenish-white.

P. P.—The leaves and branches in the recent state abound in an acrid milky juice, which becomes black on exposure to the air; so acrid is this juice, that even the emanations from the shrub will in some persons produce heat, redness, and sometimes erysipelatous inflammation, if they are exposed to its influence. In the dry state the leaves have no odour; they have a weak, somewhat acrid taste.

C. P.—No chemical analysis has been made of this plant; the milky juice probably contains a volatile narcotico-acrid principle. In the dry state, the usual tests indicate the presence of tannin, gallic acid, and resinous extractive.

TH. E.—In large doses, toxicodendron acts as a narcotico-acrid poison. It has not been much employed in medicine, as the leaves are nearly inert in the dry state, owing to the volatility of their ac-

tive principle. They were at one time much vaunted as a remedy for paralysis, particularly paraplegia, in cases where the disease was supposed to depend on a torpid condition of the nerves.

D. & M. of Adm.—Of the powdered leaves, gr. j. to gr. v., three or four times a day.—*Tinctura Toxicodendri.* (Toxicodendron leaves, ℥j.; rectified spirit, f℥xij.; distilled water, f℥iv.; mix, digest for six days, and filter.) Dose, f℥ss. to f℥j., three times daily.

CHAPTER XVI.

REFRIGERANTS.

(Temperants.)

Refrigerants are medicines calculated to diminish the heat of the body when morbidly increased, and to produce a sensation of coolness. Actual experiment has proved that such substances when taken into the stomach, although they cause a sensation of cold over the whole body, do not really diminish the temperature; consequently, it has been hitherto found impossible to explain satisfactorily the phenomena which follow their internal use. Applied externally, in the form of cooling or evaporating lotions, to inflamed parts, their mode of operation is readily understood, the temperature of the part to which they are applied being actually lowered. The principal use of refrigerants in the practice of medicine is in the treatment of febrile and inflammatory affections, in which the benefit they produce appears to depend on the fact that their direct action on the stomach occasions sympathetically a transient reduction in the force of the circulation. During their administration, also, irritability is allayed, and the morbid sensations of heat, thirst, and nausea are diminished.

[In view of what is here said by way of definition of this class of remedial agents, the student will be embarrassed when he turns to the next chapter, and finds it impossible to discriminate *refrigerants* from *sedatives*, even with the synonyme *contra-stimulants* superadded. He will incline to the opinion that all the refrigerants are sedatives and contra-stimulants as there defined, and candour will be compelled to honour his judgment, and yet be compelled to leave him in his dilemma.]

Acetosella, L. *Wood-sorrel. Herb of Oxalis acetosella.*—An indigenous plant, belonging to the natural family *Oxalidaceæ*, and to the Linnæan class and order *Decandria Pentagynia.*

B. C.—A small herbaceous plant; leaves radical, ternate, on long, slender, reddish leafstalks; leaflets inversely heart-shaped, hairy; scape single flowered; flowers drooping, white, with purplish veins.

P. & C. P.—Wood-sorrel is odourless, but has an agreeable acid

taste. Its only important constituent is binoxalate of potash, of which it contains from 1·06 to 1·23 per cent.; it yields its properties to boiling water.

Th. E.—This herb, infused in boiling water, forms an agreeable refrigerant drink in febrile disorders; in the present day it is only used as a domestic remedy, and might well be spared from the Materia Medica.

Acetum.—*Vinegar* (described in the division *Astringents*) is a useful refrigerant in febrile or inflammatory affections. It is not much employed as such internally; nevertheless, f℥ss. to f℥j. diluted with f℥xx. of water forms a cooling drink, and may be taken *ad libitum* in cases where its astringent property is not objectionable. As an external refrigerant, its action is attended with much benefit, applied by means of a sponge to the surface of the body; to form a solution for this purpose, f℥j. is mixed with f℥iij. of water. For internal use, the simple oxymel of the Dublin and London Pharmacopœias is well adapted, or the following preparation may be used: *Sirupus Aceti*, E. (Vinegar, French in preference, f℥xj.; pure sugar, ℥xiv.; boil them together.) Dose, f℥ij. to f℥i., as an adjunct to other medicines.

Acidum citricum, D. L. E. *Citric acid.*

P. P.—Citric acid crystallizes in transparent, colourless, regular rhomboidal prisms, terminated by four trapezoidal faces. They are inodorous, but have an agreeable, purely acid taste. Sp. gr., 1·617.

C. P.—Crystalline commercial citric acid consists of 3 HO, $C^{12}H^5O^{11}$+2 HO, but on cooling a saturated solution at 212°, it crystallizes with an eq. less of water (Graham). The crystals are permanent in the air; heated to 212°, they lose the two atoms of water of crystallization, and at a higher temperature are decomposed; 100 parts of citric acid are soluble in 75 parts of cold, or 50 of boiling water; the solution undergoes decomposition by keeping. When pure, the crystals dissolve completely in alcohol. Citric acid is readily distinguished by the following characteristic: when a few drops of a solution of the acid are added to lime-water, a clear liquid results, which becomes turbid on being heated, from the deposition of a white precipitate.

Prep.—D. L. E. Lemon juice, as much as may be required (Oiv., L. E.); prepared chalk, a sufficiency (℥ivss., L. E.; or a sufficiency, E.); dilute sulphuric acid, eight times the weight of the chalk used (f℥xxvijss., L.; f℥xxxvi., or in the same proportion to the chalk required, E.); (distilled water, Oij., L.) "Add the chalk gradually to the lemon juice made hot, and as soon as the citrate of lime has subsided, pour off the supernatant liquor; wash the citrate frequently with warm water (and dry it, D.); then pour upon it the diluted sulphuric acid (and the distilled water, L.), and boil (for a quarter of an hour, L.). Press the liquor strongly through linen, and strain it; evaporate the strained liquor (with a gentle heat, L.), and set it by that crystals may be formed; dissolve the crystals, that they may be pure, again and a third time in water (strained each time, L.), and crystallize," D. L. "Boil the lemon juice, let it rest, pour off the clear liquor, boil this again, and add the chalk to it while hot by degrees, till there is no more effervescence, and the liquid ceases to taste acid. Collect the precipitate and wash it with hot water till

the water passes colourless, squeeze the residuum in a powerful press; mix it uniformly with Oij. of distilled water, and then add the sulphuric acid by degrees and with constant stirring. Try whether a small portion of the liquid, when filtered, gives with solution of nitrate of baryta a precipitate almost entirely soluble in nitric acid; and if the precipitate is not nearly all soluble, add a little citrate of lime to the whole liquor till it stand this test. Separate now the clear liquor by subsidence or filtration, washing the insoluble matter with cold water, and adding the washings to the liquor; concentrate with a gentle heat till crystals form on the surface, set the liquor aside to cool and crystallize, and purify the crystals by repeated solution and crystallization till they are colourless," E.

Adulterations.—Citric acid is liable to be adulterated with sulphuric or tartaric acid, sulphates, tartrates, and lime. The presence of sulphuric acid or the sulphates is detected by adding acetate of lead to a solution of the acid; if the impurity be present, the precipitate occasioned is not dissolved by nitric acid. The presence of tartaric acid or the tartrates is shown by a crystalline precipitate being formed, on the addition of carbonate of potash dissolved in water, to a solution of the acid in excess. Lime or any other fixed impurity is detected by incinerating the acid with the aid of a little red oxyde of mercury; if it be pure, no ash, or a mere trace, is left.

Th. E.—Citric acid produces the refrigerant effects of lemon juice, as a substitute for which it may be employed to form cooling drinks in febrile affections, but fresh lemon juice should be preferred whenever it can be obtained.

D. & M. of Adm.—Dose, ℈i. to ʒi. To prepare a solution of the same strength as lemon juice, ʒviiiss. of the acid are to be dissolved in f℥xvj. of water. Citric acid is also employed to form effervescing draughts with the alkaline carbonates; gr. xx. of the acid are saturated by about gr. xxix. of crystalline bicarbonate of potash, or gr. xlj. of crystalline carbonate of soda, or gr. xxiv. of sesquicarbonate of soda, or gr. xvij. of hydrated sesquicarbonate of ammonia.

Incomp.—The alkalies; carbonates; acetates; the alkaline sulphurets; and tartrate of potash.

Acidum tartaricum, D. L. E. *Tartaric acid.*

P. P.—Tartaric acid occurs in white, semitransparent crystals of considerable size, the primary form of which is the right rhombic prism; it is inodorous, but has a purely acid taste.

C. P.—In the crystalline state, it consists of $C^8H^4O^{10}$ with two atoms of water. The crystals are permanent in the air; exposed to heat, they fuse in their water of crystallization, which is all driven off if the temperature be raised; and at a temperature considerably below redness, the acid is decomposed, and a series of new compounds formed. Tartaric acid is soluble in 1½ parts of cold water, and in half its weight of boiling water; it is also soluble in alcohol. The aqueous solution becomes mouldy by keeping. The most distinguishing characteristic of this acid is the crystalline precipitate, which is produced when it is added in excess to a concentrated solution of a salt of potash.

Prep.—*Dub.* "Bitartrate of potash, in powder, 10 parts; prepared chalk, 4 parts;

sulphuric acid, 7 parts; water, 120 parts; mix the bitartrate of potash with 100 parts of water heated, add gradually the chalk, and as soon as the effervescence has ceased, pour off the clear liquor; wash the residual tartrate of lime until it becomes tasteless. Drop into the clear decanted liquor as much of the water of muriate of lime as may be sufficient to throw down the tartrate of lime; wash this also with water till it becomes tasteless, and mix it with the former deposite. Then add the sulphuric acid diluted with 20 parts of water, and digest the mixture with a medium heat for 3 days, frequently agitating. Pour off the supernatant acid liquor, and wash away the acid from the sediment. Evaporate these liquors, including the first acid liquor and the washings, with a gentle heat to the point of crystallization; preserve the crystals purified by repeated solutions and crystallization, in a stoppered glass vessel." *Lond., Edin.* "Bitartrate of potash, ℔iv.; boiling distilled water, cong. iiss.; prepared chalk, ℥xxv., ʒvi.; dilute sulphuric acid, Ovij., f℥xvij. (Ox., f℥vij., E.); muriatic acid, f℥xxviss., or a sufficiency; boil the bitartrate with cong. ij. of the water, and add gradually half the chalk; when the effervescence is over, add the remainder of the chalk, first dissolved in muriatic acid diluted with Oiv. of water. After the tartrate of lime has subsided, pour off the liquor, and wash the tartrate frequently with distilled water, till it is tasteless; then pour on it the sulphuric acid, and boil for a quarter of an hour; evaporate (the strained liquor, L.) with a gentle heat, to obtain crystals. Purify by repeated solution, filtration, and crystallization."

Adulterations.—Tartaric acid is adulterated with bitartrate of potash, and with lime; the former is detected by its little solubility in cold water; the latter, by an ash being left, on the acid being incinerated with the aid of red oxyde of mercury.

Th. E.—To prepare refrigerant drinks in febrile and inflammatory diseases, tartaric acid is much employed, as being cheaper than citric acid. Its principal use, however, is for the preparation of effervescing draughts, when added to the alkaline carbonates.

D. & M. of Adm.—Gr. x. to ʒss.; its refrigerant effects are best manifested when it is dissolved in a large quantity of cold water. For the preparation of effervescing compounds, the following are the proportions required: ℈i. of crystallized tartaric acid is saturated by gr. xxvij. of crystallized bicarbonate of potash, or gr. xxxviiiss. of crystallized carbonate of soda, or gr. xxij. of sesquicarbonate of soda, or gr. xvss. of hydrated sesquicarbonate of ammonia.—*Trochisci Acidi Tartarici*, E. (Tartaric acid, ʒij.; pure sugar, ℥viij.; volatile oil of lemons, min. x.: pulverize the sugar and acid, add the oil, mix them thoroughly, and beat them with mucilage into a proper mass for making lozenges.) Commonly employed under the name of *acidulated drops* in mild sore throat and colds.

Incomp.—The alkalies; salts of potash, of lime, and of lead; and all carbonates.

Citrus aurantium, D. L. E. *Fructus succus*, D. *Fructus*, L. —*the juice of the fruit*, D.—*the fruit*, L.—*of Citrus aurantium.*—This tree is indigenous in many parts of Africa and Asia, and is cultivated extensively in the South of Europe, the Azores, and the West India Islands. It belongs to the natural family *Aurantiaceæ*, and to the Linnæan class and order *Polyadelphia Polyandria.*

B. C.—Stems smooth, cylindrical, from 12 to 15 feet high; leaves oval, pointed, entire, shining, coriaceous, on elongated winged petioles; flowers large, white, axillary, 2 to 6 on a common peduncle, fragrant; fruit, the well-known sweet orange.

The fruit of the orange is too well known to require description;

the juice consists of citric and malic acids, citrate of lime, mucilage, albumen, sugar, and water.

Th. E.—The juice of the sweet orange is an agreeable refrigerant, calculated to allay thirst in febrile and inflammatory affections; it is particularly beneficial in diseases attended with much thirst, and in which it is important not to introduce a large quantity of fluid into the stomach or intestines, as in strangulated hernia.

Limones, D. L. E. Limonum succus, D. L. *Lemons* (*and Limes*, E.). *Lemon juice. The fruit of Citrus medica*, D. E.—*of Citrus limonum*, L. E.—Natives of the same countries, and belonging to the same botanical classification as *Citrus aurantium.*

B. C.—The lemon-tree attains a height of 10 to 15 feet; leaves oval or oblong, usually toothed, petiolate; the petioles simply margined, not winged; flowers white, tinged with red; fruit ovoid, terminated with an elongated knob, containing an acid pulp.

P. & C. P.—Lemons are too well known to need description; the juice consists of 1·77 per cent. of citric acid, 0·72 of gum, malic acid, and bitter extractive, and 97·51 of water. Lemons decay by keeping; Christison states that they are best preserved by packing them with newly-slacked lime in bottles or earthenware jars, the mouths of which are secured with corks and wax. The juice may be kept unchanged for years by adding to it, expressed and strained, a tenth part of spirit of wine, filtering, and preserving in well-stopped bottles.

Th. E.—Lemon juice forms a useful and agreeable refrigerant, allaying thirst, and diminishing preternatural heat in febrile and inflammatory diseases; it is also found particularly useful in hemorrhages.

D. & M. of Adm.—Lemon juice is usually administered in the form of *lemonade*, which is prepared by adding the juice to about ten or twelve parts of boiling water, and sweetening with sugar to the taste. It is also much employed for the preparation of effervescing draughts with the alkaline carbonates; ℈j. of the bicarbonate of potash requires for its saturation f℥iiiss. of lemon juice; ℈i. of the sesquicarbonate of soda, f℥ivss.; and ℈j. of the sesquicarbonate of ammonia, f℥vi.—*Sirupus Limonum*, D. L. E. ("Fresh lemon juice, *by measure*, ℔ij.; as soon as the impurities have subsided, put the juice into a matrass, and subject it to the heat of boiling water for a quarter of an hour; when cold, pass it through a sieve; add, by degrees, ℥lviij. of white sugar, digest with a medium heat in a covered vessel, frequently shaking it, until it is dissolved; then set it aside for 24 hours, remove the scum, and pour off the sirup from the sediment," D. "Lemon juice, strained (freed of impurities by subsidence, and filtering, E.), Oj.; sugar, ℔iss.; dissolve the sugar in the lemon juice with a gentle heat, then set it aside for 24 hours; remove the scum, and pour the clear liquor from the dregs," L. E.) An excellent addition to refrigerant drinks; in febrile affections it may be given with barley-water. This sirup must be kept in well-stopped bottles, in a very cool place. Dose, f℥i. to f℥ij.

Mora, L. Morus nigra, baccæ, D. *Mulberries. The fruit of Morus nigra.*—A native of Persia, now cultivated in Great Britain; it belongs to the natural family *Urticaceæ*, and to the Linnæan class and order *Monœcia Tetrandria.*

B. C.—A small tree with rugged bark; leaves cordate, lobed; flowers greenish, in small roundish catkins; fruit dark purple, "consisting of the female flowers, become fleshy and grown together, enclosing a dry membranous pericarp" (Lindley).

P. & C. P.—The fruit, commonly called mulberries, has a faint, agreeable odour, and an acidulous, sweetish taste. It contains tartaric acid, sugar, colouring matter, and water. It yields its virtues to boiling water.

Th. E.—Mulberry juice is an agreeable refrigerant, but taken in quantity it is apt to produce diarrhœa. In the present day it is very seldom used. The following is the only officinal preparation of mulberries: *Sirupus Mori*, L. (Juice of mulberries, strained, Oj.; sugar, ℔iiss.; dissolve the sugar in the mulberry juice with a gentle heat, and proceed as for sirup of lemons.) Used for the same purposes as the sirup of lemons; it has a fine purple colour. Dose, fʒi. to fʒij.

Potassæ chloras, L. *Chlorate of potash.*

P. P.—In flat, pearly crystals, of the oblique prismatic system; inodorous, but having a cooling, unpleasant taste, like that of nitre. Sp. gr., 1·989.

C. P.—It is composed of one eq. of potassa, and one of chloric acid ($KO, Cl O^5$). It is permanent in the air; exposed to heat, it fuses, gives out oxygen below a red heat; if the heat be increased, all the oxygen is driven off, and chloride of potassium left. It is soluble in about 12 parts of cold water, and in twice its weight of boiling water. This salt is readily known by dropping a little sulphuric acid on the crystals; they first become yellow, afterward red, and give out the greenish-yellow gas peroxyde of chlorine.

Prep.—By transmitting chlorine gas to saturation through a strong solution of two or three pounds of carbonate of potash.

Adulterations.—The only impurity met with in this salt is chloride of potassium, and this arises from faulty preparation; it is readily detected by adding nitrate of silver to a solution of the salt in distilled water; if any chloride be present, a white precipitate is thrown down.

Th. E.—Chlorate of potash, in its action on the system, resembles nitre; by some it has been held to be diuretic, but its most manifest action is refrigerant. It was formerly employed in diseases which were supposed to depend on a deficiency of oxygen, as in phthisis and scurvy. More recently it has been proposed as a remedy in diseases attended with a deficiency of the saline constituents of the blood, as in malignant cholera, typhoid fevers, &c. But at present it is very little used as a medicinal agent.

D. & M. of Adm.—Gr. x. to gr. xx. dissolved in water, and sweetened with sirup.

Potassæ nitras.—*Nitrate of Potash* (described in the division *Diuretics*) operates as a refrigerant, sensibly diminishing preternatural heat in febrile and inflammatory affections; during its operation, also, the force and frequency of the pulse are diminished, and, consequently, it has been named a sedative refrigerant. The employment of nitre in hemorrhages, particularly hœmoptysis, is attended with much benefit, which depends undoubtedly on this combined action. Nitrate of potash is contra-indicated in inflammatory affections of the stomach, the intestinal canal, the kidneys, or bladder, in consequence of its irritant properties, which have been alluded to in a previous article. Externally, nitre is employed as a means of producing cold during its solution in water.

D. & M. of Adm.—In powder, gr. x. to gr. xx., mixed with sugar, or dissolved in water. *Nitre whey*, prepared by boiling ʒij. of nitre in Oj. of new milk and straining, is an excellent refrigerant drink in mild febrile diseases. Dose, fʒij. to fʒiv. Where nitre is to be administered as a refrigerant dissolved in water, the effect is much increased, if the solution is not made until just before it is swallowed.

Rosa canina, fructus, D. Fructus pulpa, L. Rosæ fructus, E. *The fruit*, D.—*the pulp of the fruit*, L.—*the hip, deprived of the carpels*, E.—*of Rosa canina, and of several allied species*, E.—The dog rose is a common indigenous shrub, belonging to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia*.

B. C.—Stem with scattered, hooked prickles, which are dilated at the base; leaves naked or slightly hairy; leaflets with irregular serratures; flowers rose red; fruit scarlet.

P. & C. P.—The pulp (*hip*) of the dog rose consists of the fleshy calyx, enclosing numerous small carpels enveloped with hairs; it is of a bright scarlet colour, smooth and shining. The external coat is alone used in medicine; it should be carefully freed from the carpels and hairs; it has a sweetish, acidulous taste, and is composed chiefly of uncrystallizable sugar, gum, citric and malic acids.

Th. E.—The hip of the dog rose is an agreeable refrigerant; it is only employed in medicine in the following preparation: *Confectio Rosæ caninæ*, E. *Conserva Rosæ fructus*, L. ("Pulp of the dog rose, ℔j.; sugar, powdered, ʒxx. Expose the pulp of the rose to a gentle heat in an earthen vessel, then add the sugar gradually, and rub together until they are thoroughly incorporated," L. "Take any convenient quantity of hips, carefully deprived of their carpels, beat them to a fine pulp, adding gradually thrice as much sugar," E.) Used only as a basis for forming more active remedies into pills or electuaries, and, as it contains no tannin, it may be employed for this purpose with the salts of iron.

Rumex, L. Rumex acetosa, folia, D. *Sorrel. The leaves of Rumex acetosa.*—An indigenous plant, belonging to the natural family *Polygonaceæ*, and to the Linnæan class and order *Hexandria Trigynia*.

B. C.—1 to 2 feet high; leaves oblong, arrow-shaped; flowers purplish, with large orbiculari-cordate petals; nuts triquetrous.

P. & C. P.—Sorrel leaves have an agreeable, acidulous taste, which they owe to binoxalate of potash; they also contain tartaric acid.

Th. E.—They were at one time employed for preparing acidulous refrigerant drinks in fevers, but are now never used.

Rumex aquaticus, radix, D.—The root of the *great water dock* is still retained in the *Dub. Phar.*, but its use is quite obsolete. It was formerly employed for preparing alterative diet drinks in secondary syphilis.

Sambucus nigra, baccæ, D.—The berries of the elder (described in the division *Cathartics*) contain a purple juice, which is refrigerant, and by some said to be mildly laxative. The following preparation, in the present day scarcely ever employed, was formerly used diluted with water, to prepare a cooling drink in febrile and inflammatory affections: *Succus Spissatus Sambuci*, D. (Bruise fresh elder-berries in a mortar, express the juice and evaporate it unstrained, with the aid of a vapour-bath, to a proper consistence, stirring constantly with a spatula towards the end of the evaporation.)

CHAPTER XVII.

SEDATIVES OR CONTRA-STIMULANTS.

(Calmatives.)

Sedatives are medicines which directly and primarily depress the vital powers, without inducing any previous excitement; from their action being the reverse of stimulants, they have been also very generally termed Contra-stimulants. This class of medicinal agents has been in general confounded with *Narcotics;* and were we merely to theorize on their mode of action, it would be, perhaps, difficult to draw an exact line of distinction; but when we come to consider the remedial powers of the medicines classed under each head, it will, I think, be at once evident how *practically* essential it is that we should recognise this as an especial class of remedial agents. The diseases in which sedatives are employed are those of over excitement of the nervous and vascular systems; some of the substances contained in this class, for example, Aconite, act directly on the nervous system; while others, as Digitalis, influence more immediately the vascular organs. It will be, therefore, necessary, before prescribing for individual cases, to consider attentively the peculiar operation of the different sedatives. An

important and practical rule to be borne in mind with reference to the operation of contra-stimulants is, that the doses must be in general proportioned to the degree of excitement present; this *tolerance* of medicines is remarkably illustrated by the very large doses of *tartar emetic* which are administered not only with impunity, but with advantage, when inflammatory action runs high.

[The distinction here attempted between *sedatives* and *narcotics*, though alleged to be of great *practical* importance, is one very difficult of recognition; and if we are to judge of it by the explanations here given, equally difficult of demonstration. Indeed, the identity claimed for *sedatives* with *contra-stimulants*, by making these terms synonymes, is, to say the least, mystical, and, for all that appears, transcendentalism itself. It is true, reference is made to the *toleration* by the stomach of large doses of tartar emetic when employed as a *contra-stimulant* in acute pneumonia, but the analogy between the action of this agent and either prussic acid or tobacco is forced, there being no parallel in the cases.

This criticism upon the accuracy of the title given to this class is only intended to express objections to the classification here made, while admitting, at the same time, that similar and even greater inaccuracies might be indicated in every system of nomenclature which has ever been adopted in this department. The author has done as well as may possibly be expected of any writer, but we must know more than has yet been ascertained of the therapeutical properties of medicines, before we can accurately adjust an arrangement of remediate agents based upon their ultimate medicinal effects. A true physiological classification of the Materia Medica is a desideratum yet to be attained, and it is one worthy of the ambition of the present generation of the ardent cultivators of this department of the profession.]

ACIDUM HYDROCYANICUM, E. ACIDUM HYDROCYANICUM DILUTUM, L. ACIDUM PRUSSICUM, D. *Medicinal Hydrocyanic or Prussic acid. Hydrocyanic acid diluted with about fifty (thirty, E.) parts of water.*

PREP.—*Dub.* "Cyanuret of mercury, ʒi.; muriatic acid, fʒvij.; water, fʒviij.; from a glass retort distil into a refrigerated receiver, fʒviij.; preserve in a well-closed bottle in a cool, dark place. The specific gravity of this acid is to that of distilled water as 998 to 1000." *Lond.* "Ferrocyanide of potassium, ʒij.; sulphuric acid, ʒiss.; distilled water, Oiss.; mix the acid with fʒiv. of the water, and to these, when cooled and put into a glass retort, add the ferrocyanide of potassium, first dissolved in Oss. of water; pour fʒviij. of the water into a cooled receiver, then, the retort being fitted on, let fʒvj. of acid pass into this water distilled with a gentle heat in a sand-bath. Lastly, add fʒvi. more of distilled water, or as much as may be sufficient, that 12·7 grains of nitrate of silver dissolved in distilled water may be accurately saturated by 100 grains of this acid. Diluted hydrocyanic acid may be also prepared, when it is more immediately wanted, from gr. xlviiiss. of cyanide of silver, added to fʒi. of distilled water, mixed with gr. xxxixss. of hydrochloric acid. Shake all these in a well-stopped vial, and after a short interval pour off the clear liquor into another vessel. Keep this for use, the access of light being prevented." *Edin.* "Ferrocyanide of potassium, ʒiij.; sulphuric acid, fʒij.; water, fʒxvj.; dissolve the salt in fʒxj. of the water, and put the solution into a matrass with a little sand; add the acid, previously diluted with fʒv. of the water and cooled; connect the matrass with a refrigeratory; distil with a gentle heat, by means of a sand-bath or naked gas flame, till fʒxiv. pass over, or till the residuum begins to froth up; dilute the product with distilled water till it measures fʒxvj."

P. P.—Medicinal hydrocyanic acid is a colourless liquid, with a peculiar penetrating odour, and a bitter taste, leaving a warm sensation on the tongue and palate. The odour is generally stated to resemble that of the volatile oil or distilled water of bitter almonds, but it is decidedly different, and should not be confounded with it. The specific gravity varies with the quantity of real or anhydrous acid contained in it.

C. P.—The medicinal acid is a mixture of anhydrous hydrocyanic acid and water. Prepared according to the directions of the Dublin College, it contains, according to Barker's observations, 1·6 per cent. of real acid; but according to Mr. Donovan, 2·82 per cent. The London preparation contains 2 per cent., and the Edinburgh 3·3 per cent. Anhydrous hydrocyanic acid is composed of 1 eq. of cyanogen, and 1 of hydrogen (H+Cy). The quantity of pure acid contained in the medicinal preparation may be readily ascertained, "by accurately weighing a portion of it, amounting to about 100 grains, adding to this portion nitrate of silver in excess, collecting the white insoluble precipitate of cyanide of silver which falls on a weighed filter, drying and weighing together, precipitate, and filter; five parts of the precipitate correspond to one part of pure acid" (Graham). Hydrocyanic acid reddens litmus paper feebly, and the red tint disappears by heat; it is very volatile, and soon decomposes by keeping, a black precipitate being formed in it. For medicinal purposes, the dilute acid may be kept for a long time unchanged by the addition of a few drops of sulphuric acid. The best test for the presence of this acid is its action on sulphate of iron; if a few drops of a solution of caustic potash be added to a fluid suspected to contain hydrocyanic acid, and then a solution of some proto and sesqui-salt of iron, as the common sulphate or tincture of the muriate of the shops, a greenish precipitate is produced, which becomes bright Prussian blue on the addition of a little sulphuric acid. Its presence is also indicated by adding a few drops of sulphuric acid to the liquid containing it, and covering the vessel with a glass plate, having its lower surface moistened with a solution of nitrate of silver; owing to the volatility of the acid, the surface of the plate will be covered with the white cyanide of silver.

Adulterations.—Medicinal prussic acid, as met with in the shops, varies much in strength, is often much contaminated with impurities, and frequently is unfit for use, from having been too long kept. The strength is most conveniently ascertained by Professor Graham's test given above, of course bearing in mind the difference of the preparations of the three British Pharmacopœias. The presence of any fixed impurity is indicated by the preparation not being entirely vaporizable by heat. The most common impurity met with is sulphuric or muriatic acid; their presence may be suspected if the medicinal preparation acts strongly on litmus paper; they may be easily detected by the test first proposed by my friend Professor Geoghegan. "Drop one or two crystals of the *hydrar-*

*gyro-iodo-cyanide of potassium** into the suspected acid; should any foreign acid be present, a red precipitate will immediately be formed on them." When unfit for use from being kept too long, it is generally, though not always, discoloured.

Th. E.—Hydrocyanic acid is the most powerful poison with which we are acquainted; "death has been occasioned in man by a mixture containing scarcely one grain of the anhydrous acid" (Christison). The usual symptoms produced by a poisonous dose are convulsions, difficult and spasmodic breathing, and insensibility, followed by death in a few minutes; in some instances, however, life has been prolonged for half an hour or more; but if the quantity taken be very large, death occurs so rapidly that the only symptoms that can be observed are two or three deep, hurried inspirations. In medicinal doses, hydrocyanic acid acts as a direct sedative, producing immediately after it has been taken a sensation of quiet and calmness throughout the whole system, diminishing the force and frequency of the pulse, lowering the sensibility of the nervous system, and allaying irritation when it exists; in addition to the above, which may be said to be its more immediate effects, hydrocyanic acid promotes the digestive powers, and in many instances acts gently on the bowels. As a remedial agent, this acid has been principally used to allay irritability, to diminish pain, and to lessen spasm. Thus it has been used with much benefit in spasmodic and painful affections of the stomach and bowels, as in *gastrodynia* and *enterodynia*, in *pyrosis*, particularly when accompanied with much pain; in chronic vomiting, and in *colica pictonum*. It has also been found very serviceable in allaying irritable or spasmodic cough in various pulmonary affections, as in simple hoopingcough unaccompanied with inflammation, in pure spasmodic asthma, in the advanced stages of phthisis, and in the spasmodic cough of nervous and hysterical females. It has also been successfully employed to allay vomiting and purging in severe cases of common cholera, and to check the colliquative diarrhœa, and sweating of hectic. Lastly, it has been administered as a calmative and anodyne in neuralgia, tic douloureux, chronic rheumatism, cancerous affections, and nervous palpitations, but its success has been very equivocal. Externally, in the form of lotion, it will be found very serviceable in allaying the violent itching which attends many forms of skin disease.

D. & M. of Adm.—The medicinal acid should be at first administered in doses of one or two drops, which should be repeated every second or third hour according to circumstances, as its effects are very transitory. It is best given in distilled water, to which simple sirup may be added; it should always be prescribed in the form of draught, as, when given in mixture, it is apt to float on the top of the liquid, and thus a single dose may produce dangerous effects. The quantity given should be increased very gradually,

* This salt may be readily prepared by adding a concentrated solution of bicyanide of mercury to a solution of iodide of potassium, when it is precipitated in the form of white or pearly crystalline plates.

and its effects carefully watched. For external use, a lotion may be prepared with f℥ij. of the acid, and f℥viij. of distilled water.

Incomp.—Nitrate of silver; red oxyde of mercury; sulphate of copper; sulphate and muriate of iron if an alkali be present; and strychnia.

In cases of poisoning with prussic acid, if the person be seen immediately, he should be made to inhale ammonia or chlorine diluted with atmospheric air, or the solutions of either of those gases in water should be administered in small but frequently-repeated doses; but if some time has elapsed, and insensibility be present, the most powerful external stimulants, with the cold affusion and artificial respiration, should be employed.

[Acidum pyroligneosum. *Pyroligneous acid.*

P. & C. P.—This remedy was anciently known as *cedria*, or *the oil of tar*, and was used by the Egyptians as an embalming agent, it being powerfully antiseptic. That it contains creosote is possibly the secret of its potency. It is procured by the dry distillation of hard wood, in an iron retort heated to redness, and its chief ingredient is found to be vinegar having empyreumatic oil and resin in solution, and in its strongest form is acetic acid.

Th. E.—It is chiefly applied externally, although its internal use is occasionally advised in sphacelus, gangrene, putrid ulcers, and cachexy; in phthisis, scrofulous eruptions, and discharges, particularly in cacrum oris, and diseases of the internal ear. Creosote has, however, almost supplanted its use. Though alleged to be narcotic, yet this property is equivocal.

D. & M. of Adm.—The differences in the strength of the acid requires caution in its internal use. In ordinary cases, the dose is from 5 to 20 drops in some aromatic water, 3 or 4 times a day. As a caustic, it may be applied externally with a pencil; and diluted with 8 parts of water, it is used as a wash or injection; and for a collyrium and gargle, 12 parts of water to 1 of the acid. In purulent discharges from the ear, 2 drachms to 6 oz. of water will form a useful injection; and in cases of deficient cerumen, 2 drops of the following may be dropped into the ear night and morning: ℞ acid pyroligneous, oil of turpentine, sulphuric ether, equal parts.]

Aconitum, E. Aconiti folia et radix, L. Aconitum paniculatum, folia, D. *Monkshood. The leaves* (*and root*, L.) *of Aconitum paniculatum*, D. L. *The leaves of Aconitum Napellus*, E.—It has not been yet accurately ascertained which species of the genus *Aconitum* was employed by Störck, who was the first to use it as a medicine; the reference of the Edinburgh College appears to me to be the more correct. This species is said to grow wild in some parts of England, but it was probably introduced from the Continent of Europe, where it grows abundantly in woods. It belongs to the natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Trigynia*.

B. C.—Root tapering; stem simple, 3 to 5 feet high; leaves palmate, cuneate,

pinnatisect; flowers on a long spike, deep blue, with an irregular petaloid calyx, the upper leaflet of which is helmet-shaped.

M. of Prep.—The root should be dug up in spring before the leaves appear, and the leaves should be gathered just before the flowers expand; both should be dried carefully with a stove heat.

P. P.—Aconite root has a faint, earthy odour, and a bitter, acrid taste, leaving a benumbing impression on the lips and tongue. The leaves have a very feeble, narcotic odour; their taste is similar to that of the root. When carefully dried, they retain their virtues for many years, if kept in close vessels, in a dry place, excluded from the light.

C. P.—No very accurate chemical analysis has been made of this plant. It contains an acrid volatile principle, green colouring matter, vegetable albumen, some salts, and a peculiar alkaloid, first discovered by Brandes, and named by him *aconitina;* as this substance has been introduced into the last edition of the London Pharmacopœia, the process for preparing it and its properties will be described among the pharmaceutical preparations of the plant. Aconite leaves or root yield their active principles completely to alcohol, but very imperfectly to water.

Th. E.—In large doses, the leaves or root of aconite are highly poisonous, appearing to produce death by a direct depression of the vital powers: thus, the most manifest symptoms are stupor, general muscular debility, and failure of the circulation; in addition to which, a feeling of numbness and tingling is experienced over the entire surface of the body; vomiting also occurs, and frequently loss of sight, the pupil of the eye being contracted; convulsions or coma are rarely produced by poisonous doses of aconite. As a medicine, it has been used with the most marked benefit in all forms of painful diseases, even when accompanied with inflammation; this is well illustrated by its employment in the treatment of acute rheumatism, and of neuralgia. In the former of those diseases it has proved, in the hands of Dr. Lombard, of Geneva, a complete specific, the alcoholic extract, given in doses of from half a grain to eight grains frequently repeated, curing the severest attacks of febrile rheumatism in from two to six days. It has not, however, proved so successful in the practice of British physicians, which is probably owing to the inertness of the officinal extract of the Dublin and London Pharmacopœias; in a few cases in which I employed the powdered leaves, the beneficial results were most marked. In neuralgic pains, particularly *tic douloureux*, applied externally in the form of tincture, it seldom fails to ameliorate the suffering, and in many instances will cure the disease. It is not so useful in *sciatica* or *lumbago*. It has also been employed in the treatment of many other diseases, but in none of them has its efficacy been well established.

D. & M. of Adm.—The powder of the root or leaves may be given in doses of from gr. iij. to gr. xij., gradually increased until some effects are produced.—*Extractum Aconiti*, L. E. *Succus Spissatus Aconiti*, D. ("Fresh aconite leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the

juice, and evaporate it, unstrained, to a proper consistence," D. L. "Take of fresh leaves of monkshood any convenient quantity, beat them into a pulp, express the juice, subject the residue to percolation with rectified spirit, so long as the spirit passes materially coloured; unite the expressed juice and the spirituous infusion; filter, distil off the spirit, evaporate the residue in the vapour-bath, taking care to remove the vessel from the heat so soon as the due degree of consistence shall be attained," E.) As aconite leaves yield their active principles almost entirely to alcohol, and but very partially to water, the Edinburgh preparation must alone be active. The dose of it is gr. ij. to gr. viij., repeatedly.—*Tinctura Aconiti.* (Aconite root, recently dried and coarsely powdered, ℔j. (or fresh aconite leaves, ℔ss.); rectified spirit, Oiss.; macerate for 14 days, express, and strain.) Dose, min. v. to min. viij.; it should be used with caution; the best form for external use.—*Extractum Alcoholicum Aconiti.* (Prepared by distilling off the spirit from the tincture.) Dose, gr. $\frac{1}{4}$ to gr. j.—*Unguentum Aconiti.* (The alcoholic extract, 1 part; prepared lard, 2 parts; mix.) An excellent application rubbed over the painful part in neuralgia.—*Aconitina*, L. (Aconite root, dried and bruised, ℔ij.; rectified spirit, cong. iij.; dilute sulphuric acid, solution of ammonia, purified animal charcoal, of each, a sufficiency. Boil the aconite with a gallon of the spirit for an hour in a retort with the receiver adapted to it, pour off the liquor, and again boil the residue with another gallon of spirit and with the spirit recently distilled, and pour off the liquor; let the same be done a third time. Then press the aconite, and all the liquors being mixed and strained, let the spirit distil; evaporate what remains to the proper consistence of an extract. Dissolve this in water, and strain; evaporate the liquor with a gentle heat, that it may thicken like a sirup. To this add of dilute sulphuric acid mixed with water, as much as may be sufficient to dissolve the aconitina; then drop in the solution of ammonia, and dissolve the precipitated aconitina in dilute sulphuric acid and water, mixed as before; afterward mix the animal charcoal, frequently shaking them during a quarter of an hour. Lastly, strain, and solution of ammonia being again dropped in, that the aconitina may be precipitated, wash and dry it.) Aconitina is in the form of a white, semi-crystalline powder, odourless, with a bitter taste. It is very soluble in sulphuric ether, less so in alcohol, and very slightly in water. When perfectly pure, this alkaloid is so powerful a poison, "that a fiftieth of a grain has endangered the life of an individual" (Pereira). As usually met with, it is of a grayish-yellow colour, in which state it is very impure. Aconitina possesses, but of course much more powerfully, the same medicinal virtues as monkshood; it has been principally used in the form of ointment, in *tic douloureux* and other neuralgic pains. But it does not appear to possess sufficient advantages over the alcoholic extract as (considering its enormous price, 3*s.* 6*d.* to 4*s.* 6*d.* a grain) would warrant its employment as a medicinal agent. It cannot be administered internally with safety.—*Solutio Aconitinæ*, Turnbull. (Aconitina, gr.

viij.; rectified spirit, f℥ij.; dissolve.) Applied externally, by means of a small sponge.—*Unguentum Aconitinæ*, Turnbull. (Aconitina, gr. xvj.; olive oil, ℥ss.; lard, ℥i.; mix.) Employed by friction with the finger during several minutes.

In cases of poisoning with monkshood, emetics should be immediately administered, and the most active stimulants, both external and internal, should be employed. No antidote has as yet been discovered for it.

Amygdale amaræ, oleum. *Essence* (*Volatile oil*) *of bitter almonds.*—The bitter-almond tree has been described in the division *Emollients.*

Prep.—Oil of bitter almonds is obtained by submitting to distillation with water bitter-almond cake, left after the separation of the fixed oil by expression.

P. P.—As usually met with it is of a golden-yellow colour, but when obtained from almonds which have been blanched it is colourless when first drawn. It is transparent, with an agreeable *ratifia* odour, and an acrid, warm, bitter taste. It is heavier than water, its specific gravity being 1·083.

C. P.—Oil of bitter almonds, as prepared by distillation, consists of from 8·5 to 14·33 per cent. of pure hydrocyanic acid, mixed with *benzoïc acid*, *benzoïn*, *benzimide*, and *hydruret of benzoil.* Its poisonous and medicinal properties depend on the hydrocyanic acid, which may be completely removed from it by repeated distillation from a solution of caustic potash. The oil is very soluble in alcohol and ether; by agitation with water, a portion of the hydrocyanic acid is dissolved out, and the water acquires the peculiar odour and taste of the acid.

Th. E.—As the medicinal properties of this oil depend on the hydrocyanic acid it contains, its effects and uses are of course similar to those of that acid, for which it has been proposed as a substitute; but, as its strength is very variable, it should not be employed for internal use. It should be borne in mind that the oil of bitter almonds is at least four times the strength of officinal prussic acid.

Amygdalus Persica, folia, D. *Peach leaves. Leaves of Amygdalus Persica* (*Persica Vulgaris*, Miller).—The peach-tree, originally a native of Persia, is now cultivated extensively in our gardens; it belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Monogynia.*

B. C.—A small tree, with lanceolate, serrate, or crenate leaves, and rose coloured flowers; fruit a fleshy, tomentose drupe.

P. & C. P.—*Peach leaves*, when bruised, emit the peculiar bitter-almond odour; by distillation with water they yield a small quantity of volatile oil, which contains hydrocyanic acid. Their active principles are extracted by boiling water.

Th. E.—The medicinal properties of peach leaves are precisely similar to those of the cherry laurel, but much weaker. They are, consequently, scarcely ever used, and might be very well spared

from the Materia Medica. Both leaves and flowers were formerly employed in the form of infusion, as anthelmintics for children, but several fatal accidents having occurred from their incautious administration, their use as such was very properly abandoned.

Antimonium tartarizatum.—*Tartar emetic* (described in the division *Diaphoretics*), when administered in full doses frequently repeated, acts on the human system as a direct *sedative* or *contra-stimulant*, this effect being most manifest when it is given in inflammatory diseases. Under the influence of doses of one, two, or three grains repeated every hour or every second hour, the nausea, vomiting, or purging which are produced by the first or second dose cease entirely, the force and frequency of the heart's action is lowered, and local inflammation is arrested. In Lepelletier's essay, two cases of pneumonia are mentioned, in one of which the pulse was reduced from 120 to 34 beats per minute in nine days, and in the other from 72 to 44 beats per minute in three days, under the use of continued doses of tartar emetic. This contra-stimulant power of tartar emetic is applied with benefit to the treatment of acute inflammations, either alone, or as an adjunct to bleeding or other antiphlogistic means. The diseases in which this plan of treatment has been found most beneficial are *acute pneumonia* and *pleuritis*. British practitioners usually employ either local or general bleeding in those diseases, in conjunction with tartar emetic; but, although in pleuritis the combined abstraction of blood will be in most instances absolutely requisite, many cases of pneumonia will be cured as speedily and as effectually by the use of tartar emetic alone; indeed, by many physicians bleeding is considered singularly injurious to the development of the sedative influence of this medicine. This mode of administering tartar emetic has been also employed in the treatment of bronchitis, of arachnitis, and of many other acute inflammations, but in none are its beneficial effects so manifest as in inflammation of the lungs, and in pleurisy. As a contra-stimulant, tartar emetic is given in doses of from half a grain to two grains every hour or every second hour, dissolved in a small quantity of water, one or two ounces at most; the best vehicle for its administration is orange-flower water. The first dose or two should not exceed half a grain, and the patient should not be permitted to drink, so as, if possible, to avoid producing vomiting; when once a tolerance of the medicine is produced in the system, the quantity taken may be rapidly increased.

Conium, E. Conii folia [U. S. P.] et fructus, L. Conium maculatum, folia, D. *Hemlock. The leaves (and fruit, L.) of Conium maculatum.*—Indigenous, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia*.

B. C.—Biennial; root fusiform, whitish, 6 to 12 inches long; stem 2 to 6 feet high, striated and spotted with purple, smooth, glaucous, hollow, much branched upward; leaves large, tripinnate; leaflets lanceolate, pinnatifid, with acute and often cut segments; flowers white, in umbels of many general as well as partial rays;

general involucre usually 3 to 7 leaflets; *partial involucre* of 3 leaflets on one side; fruit ovate, compressed laterally, with five primary undulato-crenate ridges. The whole plant, when bruised, emits a peculiar fetid odour like that of mice.

P. U. & M. OF PREP.—The leaves are officinal in the three British Pharmacopœias; they should be gathered when the plant is in full flower, the stalks carefully picked out, and the leafy part dried with a stove heat, excluded from the light. For medicinal purposes, they should be kept in well-stopped opaque bottles or jars; but as they lose much of their virtues by keeping, the druggist's stock should be renewed every year. The seeds are collected when fully ripe; they are more active than the leaves, and preserve their medicinal powers for a much longer period.

P. P.—Hemlock leaves, in the fresh state, are of a glaucous-green colour, and possess remarkably the characteristic odour of the plant; by drying they acquire a dull grayish-green colour, and lose much of their odour. They have a nauseous, bitter taste. The fruit has a weaker odour; its taste is bitter, and somewhat acrid.

C. P.—Hemlock leaves and fruit contain a peculiar alkaloid which has been named *conia* (*conein* or *conicin*), a volatile odorous principle, albumen, resin, colouring matter, and some salts. The active principle of the plant is the alkaloid *conia;* it is a colourless, oily liquid, lighter than water, with a peculiar, penetrating, very disagreeable odour, and an intensely acrid taste; it is nearly as active a poison as pure prussic acid. *Conia* is obtained by the distillation of the leaves or fruit with a caustic alkali; it exists in the greatest quantity in the full-grown green fruit, eight pounds yielding half an ounce of *hydrated conia* (Christison). The composition of this alkaloid is $C^{12}H^{14}NO$. On triturating the leaves or fruit of hemlock with caustic potash, the peculiar odour of *conia*, which should not be confounded with that of the plant, is emitted; and as the medicinal virtues depend on the presence of this alkaloid, a ready test is thus afforded us of ascertaining the goodness of any of the preparations of hemlock. The leaves and fruit yield their active properties to water, alcohol, oils, and fats.

Adulterations.—Other umbelliferous plants which bear a general resemblance to hemlock are frequently confounded with it, and their leaves often sold for those of the true plant. The distinguishing botanical characteristics of the plant are, its smooth, purple-spotted stem, and its unilateral, partial involucre; the fruit is readily known by its undulato-crenate primary ridges. Chemically, all parts of the plant are known by the peculiar odour of conia evolved on trituration with caustic potash; and this test, as before remarked, is also applicable for ascertaining the quality of the officinal preparations of hemlock.

TH. E.—From the recent investigations which have been made into the actions of hemlock, particularly those of Professor Christison and Mr. Judd, it would appear that its influence is chiefly exerted on the nerves of motion, and that its medicinal powers are those of a direct sedative. When taken in poisonous doses, the symptoms preceding death are very similar to those produced by asphyxia from any cause: thus, "it does not excite convulsive spasms, or bring on insensibility; but it exhausts the nervous energy of the spinal chord and voluntary muscles, occasioning merely convulsive tremours and slight twitches, and eventually general

paralysis of the muscles, and consequent stoppage of the breathing" (Christison). Much difference of opinion exists as to the action of hemlock when employed as a medicine, and, consequently, as to the diseases in which it proves beneficial; this arises from the fact that the preparations of hemlock which were in general use until very lately were perfectly inert; for since the discovery of the active principle of the plant, it has been satisfactorily shown that the application of even a moderate degree of heat, when continued for any time, causes it to undergo decomposition, and therefore that the extract (the preparation most generally employed), when prepared according to the directions of the Dublin and London Pharmacopœias, is deprived almost completely of its medicinal virtues; and of this I have frequently satisfied myself by the potash test. In the present day, but little faith is placed in the virtues of hemlock as a deobstruent and alterative in the treatment of glandular or visceral enlargements, of scrofulous affections, of secondary syphilis, or of chronic skin diseases, for which it was at one time highly esteemed. I have myself derived very beneficial results from the use of hemlock in many painful affections, some of which were attended with inflammation; the preparation which I employed was the expressed juice carefully prepared from the fresh leaves gathered when the plant was in full flower. The diseases in which I principally used it were the various rheumatic affections, both acute and chronic, neuralgia, and senile gangrene; in all of which I have found it alleviate pain and diminish nervous excitement. On the whole, from the experience which I have had of it, I am inclined to think that hemlock will be found an anodyne and sedative of much power, and that it deserves to be more generally used than it has been of late. Hemlock has been employed externally in the form of cataplasm or ointment to cancerous and painful ulcerations, and to tender glandular enlargements. In two cases in which the use of the expressed juice of hemlock had been persevered in for some time, and the dose much increased, the patients complained of great dryness, with a painful feeling of constriction of the pharynx, so much so as to compel its use to be suspended.

D. & M. OF ADM.—The dose of the powder of the leaves, a bad form, is from gr. v. to gr. x., three or four times a day; of the powder of the seeds, gr. iij. to gr. vi. may be given; the quantity should be gradually increased.—*Extractum Conii*, L. E. *Succus Spissatus Conii*, D. ("Fresh hemlock leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evaporate it, unstrained, to a proper consistence," D. L. "Take of conium, any convenient quantity; beat it into a uniform pulp in a marble mortar, express the juice, and filter it. Let this juice be evaporated to the consistence of firm extract, either in a vacuum with the aid of heat, or spontaneously in shallow vessels exposed to a strong current of air, freed of dust by gauze or screens. This extract is of good quality only when a very strong odour of conia is disengaged by degrees on its being carefully triturated with Aqua potassæ," E.) Dose, gr. iij. to gr. v., gradually increased. This

is always an uncertain preparation, and does not keep well.—*Tinctura Conii*, D. L. E. ("Hemlock leaves, dried, ʒij. (ʒv., L.); cardamom, bruised, ʒi.; proof spirit, *by measure*, ℔j. (Oij., L.); macerate for 7 (14, L.) days, and strain," D. L. "Fresh conium leaves, ʒxij.; tincture of cardamom, Oss.; rectified spirit, Oiss.; bruise the leaves, express the juice strongly; bruise the residuum, pack it firmly in a percolator; transmit first the tincture of cardamom, and then the rectified spirit, allowing the spirituous liquors to mix with the expressed juice as they pass through; add gently water enough to the percolator for pushing through the spirit left in the residuum. Filter the liquor after agitation," E.) The tincture of the Edinburgh College is a much superior preparation to that of either Dublin or London, as being prepared from the fresh leaves; nevertheless, as the process requires some nicety of manipulation, it is apt to vary in strength, which the presence of the tincture of cardamoms will prevent us from judging of; the dose of it is from min. xx. to min xl., gradually increased.—*Succus Conii.* (Fresh hemlock leaves, any quantity; express the juice strongly; set aside for 48 hours, pour off the clear supernatant liquor, and add to it a fifth part of rectified spirit.) This is the most certain of the preparations of hemlock, as it is of a uniform strength, and keeps well. Dose, min. xx., gradually increased to f℥i., three or four times daily, its effects being carefully watched.—*Pilulæ Conii comp.*, L. (Extract of hemlock, ʒv.; ipecacuanha, powdered, ʒi.; mixture of acacia, as much as may be sufficient; beat them together until they are incorporated.) Dose, gr. v., three times a day; intended for an anodyne and expectorant in hoopingcough, bronchitis, and the incipient stage of phthisis, but, from the observations made above on the extract, its powers must be very feeble.—*Cataplasma Conii*, D. L. ("Hemlock leaves, dried, ʒj.; water, *by measure*, ℔iss.; boil down to ℔j., and to the strained liquor add as much of the same kind of powder as is sufficient to make a cataplasm," D. "Extract of hemlock, ʒij.; water, Oi.; mix, and add linseed, bruised, as much as may be sufficient to make it of a proper consistence," L.) A soothing poultice to painful ulcers or glandular enlargements. The fresh leaves, bruised, would form a much better application.—*Unguentum Conii*, D. (Fresh hemlock leaves and prepared hog's lard, of each, ℔j.; boil the leaves in the lard until they become crisp, then express through linen.) An excellent sedative and anodyne ointment.—*Emplastrum Conii*, Pol. (Yellow wax, 2 parts; resin and olive oil, of each, 1 part; melt together, and add to the mass when it begins to cool powdered hemlock, 2 parts; mix thoroughly.) For neuralgic and rheumatic pains.

Incomp.—The caustic alkalies and vegetable astringents.

In cases of poisoning with hemlock, the same treatment should be followed as in poisoning with monkshood. (See page 259.)

Creasotum.—*Creasote* (described in the division *Antacids*), in poisonous doses, appears, from the observations of Dr. Cormack, of

Edinburgh, to resemble prussic acid in its sudden depressing action on the heart, as well as in the temporary nature of its toxicological operation. In medicinal doses, it operates as a sedative and calmative; its principal use has been in nausea and vomiting, in checking which it proves highly beneficial. It has been found particularly useful in the morning sickness of pregnancy, and in cases of hysteric vomiting. Creasote will be also found very efficacious in allaying vomiting, when it arises from nervous irritability or functional disorder of the stomach; but it generally fails when organic disease is present, or where the vomiting is symptomatic of diseases of other organs. In the obstinate vomiting of sea-sickness, this remedy has been found by some to prove useful, and in all the nostrums of the present day for preventing sea-sickness creasote is a principal ingredient. In *neuralgia* and in *phthisis*, this substance has been highly praised by many as being almost a complete specific, but its efficacy in those diseases is not yet well established.

D. & M. OF ADM.—Min. j. to min. ij., gradually increased to min. v. or min. vj., dissolved in an ounce, or an ounce and a half at least, of some aromatic water; or made into an emulsion with distilled water by means of sugar or yolk of egg. In the administration of creasote, it should be borne in mind that its action is temporary, and, consequently, that the dose should be frequently repeated.—*Mistura Creasoti*, E. (Creasote and acetic acid, of each, min. xvj.; compound spirit of juniper and sirup, of each, f℥j.; water, f℥xiv.; mix the creasote with the acid, add gradually the water, and, lastly, the sirup and spirit.) An excellent form for the administration of this medicine, the spirit of juniper concealing its disagreeable taste. Dose, f℥i. to f℥ij.; f℥j. contains min. j. of creasote.

DIGITALIS (described in the division *Diuretics*), in large doses, acts as a narcotico-acrid poison, producing giddiness, great debility, stupor, slow, feeble, and intermittent pulse, cold sweats, and death, immediately preceded by coma and convulsions. In medicinal doses, when its use has been continued for some time, it operates as a direct sedative, its influence being chiefly manifested on the heart and arterial system; this is indicated by the diminished force and frequency of the pulse, which is also sometimes irregular, and by the enfeebled action of the heart itself. If the use of digitalis be continued under these circumstances, although the dose be not increased, all the symptoms of poisoning come on; indeed, in many cases, will appear some days after its administration has been stopped; hence it is evident that this medicine accumulates in the system, and, therefore, in cases where its use has been continued for any period, the administration of the remedy should be occasionally suspended, particularly as soon as its constitutional effects become obvious. From the sedative influence which digitalis exerts on the heart, it may be employed in all cases attended with over-excitement of the vascular system; but where much inflammation is present, it is not sufficiently powerful as an antiphlogistic for us to rely on, to the exclusion of more active measures. It is in diseases

of the heart and large arteries that this medicine is found most beneficial; and whenever the curative indication will be best fulfilled by diminishing the impulse of the heart, and by lowering the circulation generally, no remedy will produce those results so completely and so certainly as digitalis. It thus proves useful in simple hypertrophy of the heart, in nervous palpitations, in increased action of that organ arising from functional derangement, not from organic disease, in aneurism of the aorta, and in active hemorrhages where the pulse is quick, hard, and throbbing; its employment is contra-indicated in hypertrophy of the heart with or without dilatation, when that state is produced by obstruction from any cause to the circulation of the blood, or by regurgitation from insufficiency or other disease of the valves. Digitalis has been also used in cases of insanity and of epilepsy; in the latter affection, when not dependant on organic disease, it often proves singularly beneficial when given in very large doses, so as to bring the system rapidly under its influence; in some cases which I saw with my friend Dr. Corrigan, recovery took place very rapidly under the following mode of employing this remedy: f℥ij. of the infusion of digitalis were given every night at bedtime until its constitutional effect was produced, which was usually after the fourth or fifth dose; its use was then suspended for two or three nights, according to circumstances, and then the same quantity given as before; as soon as the system became affected, the number of fits were diminished, and under the continuance of this plan of treatment for a short time, their recurrence soon ceased altogether. In the employment of digitalis as a medicine, its effects require to be carefully watched, and whenever its use is continued for any length of time, the patient should not be allownd to use any active exertion, and should be seen at least once daily by the medical attendant.

D. & M. of Adm.—As a sedative, the doses of the preparations of digitalis are as follows: of the powder, gr. j. to gr. iij.; of the infusion, f℥i. to f℥ij.; of the tincture, f℥ss. to f℥iss.—*Succus Digitalis.* (Prepared in the same manner as *Succus Conii*, page 264.) Dose, f℥i. to f℥ij.—*Extractum Digitalis*, L. E. ("Fresh foxglove leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evaparate it, unstrained, to a proper consistence," L. "Best prepared by any of the processes indicated for extract of Conium," E.) An uncertain preparation. Dose, gr. ss. to gr. j.

In cases of poisoning with foxglove, the stomach pump or powerful stimulating emetics should be immediately administered, and active stimulants, both external and internal, be assiduously employed.

Lauro-cerasus, E. Prunus lauro-cerasus, D. *Cherry-laurel leaves. Leaves of Prunus lauro-cerasus.*—A native of the shores of the Black Sea, whence it was introduced into Europe and the British Isles, where it now grows freely; it belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Monogynia.*

B. C.—An evergreen, small tree; stem smooth, much branched, 12 to 18 feet high; leaves large, bright glaucous green, coriaceous; flowers numerous, white, small, in axillary racemes; fruit an ovoid, blackish drupe, about the size of a small cherry.

P. P.—Cherry-laurel leaves are employed in the recent state for medicinal purposes; they emit an agreeable, bitter-almond odour when bruised, and have a bitter, rather astringent taste.

C. P.—These leaves have not been accurately analyzed; their properties depend on a volatile oil, which they yield by distillation with water; it resembles in odour and other properties the volatile oil of bitter almonds, and, like it, contains free prussic acid. The leaves differ much in the quantity of this oil, which they yield at different periods of their growth, and, consequently, in their activity; according to Christison, the greatest quantity is obtained from the buds and unexpanded young leaves in the months of May and June, at which time they yield 6·33 grains of oil in one thousand; in July the proportion sinks to 3·1 grains, and in the following May to 6·6. The water which comes over with the oil in the process of distillation acquires both its odour and taste, and is the only preparation of the plant which is employed in medicine.

Th. E.—Cherry-laurel leaves and their distilled water owe their virtues to the prussic acid which they contain, and, consequently, produce the same effects. An ounce of the distilled water has produced death in an adult. Cherry-laurel water is much employed in Great Britain as a sedative in spasmodic cough, in phthisis, and in painful or spasmodic diseases of children; for the latter purpose, its agreeable flavour renders it peculiarly eligible; it is, however, very liable to vary in strength, and, therefore, should be prescribed with caution.

D. & M. of Adm.—*Aqua Lauro-cerasi*, D. E. (Fresh cherry-laurel leaves, ℔j.; water, *by measure*, ℔iij. (Oiiss., E.); "distil off ℔j., and add ʒi. of compound spirit of lavender instead of rectified spirit," D. "Chop down the leaves, mix them with the water, distil off a pint, agitate the distilled liquid well, filter it if any milkiness remains after a few seconds of rest, and then add ʒi. of compound spirit of lavender," E.) The compound spirit of lavender is added as a colouring ingredient, to prevent mistakes from the preparation being taken for common water; as prepared in Dublin at present, it is usually omitted, even in that which is sold at the Apothecaries' Hall of Ireland. The dose for adults is from fʒss. to fʒi.; for infants or children, min. ij. to min. x.

Incomp.—Same as for hydrocyanic acid; as is also the treatment in cases of poisoning.

[Naphtha (Naphthe, *Fr.*). *Naphtha from wood*, &c.—A bituminous liquid, transparent, white, but a little yellowish, slightly unctuous to the touch, specifically much lighter than water, extremely combustible, emitting a strong, but not unpleasant odour, burning with a blue flame, and giving out very thick fumes.

A substance under the name of "Wood Naphtha" has been lately

recommended by Dr. Hastings, of London, as a valuable remedy in phthisis. We have not been able to ascertain with any certainty what he means by *wood naphtha*, for chemists have never applied that term to the products of the distillation of wood; but manufacturers of pyroligneous acid have been in the habit for many years past to call (improperly) "*Naphtha*" the spirituous liquid (bihydrate of Methylem) which passes with the first portions of acetic acid while distilling the *acid liquor* obtained by the combustion of wood in a close vessel. In that state it contains aldehyd, acetom, xilit, and mesit, according to Kane. To obtain it pure, Liebig introduces the impure spirit into a retort with an excess of chloride of calcium, and distils the mixture in a water-bath as long as volatile matter is disengaged. A quantity of water equal to the spirit employed is then added, and the distillation continued. The product is now pure pyroxilic spirit, carrying along with it a little water, which is removed by a second distillation with quicklime.

Another substance (*methol*), also, the product of destructive distillation of wood, having a close analogy to naphtha when purified, has been given as the wood naphtha of Hastings. According to Kane, it contains no oxygen, its formula being C^4H^3; it boils at 360°, and possesses the general characteristics of an essential oil. It appears to possess expectorant and alterative properties, stimulating the bronchii to action; has no specific effect on the tubercular formations in the body of the lungs, as described by Dr. H.

Pyroacetic Spirit has been employed in lieu of naphtha in the U. S. to considerable extent, though without any marked benefit except in bronchial irritation, in which it is extolled. It has a peculiar fragrant odour; its specific gravity is 0·7922, and boils at 132°; it dissolves in water, alcohol, and ether. It can be obtained from perfectly dry acetate of soda, and redistilled from chlorate of lime.]

POTASSII CYANIDUM. *Cyanide of Potassium.* (*Cyanuret of Potassium; Hydrocyanate of Potassa.*)

PREP.—*Parisian Codex*, 1837. "Reduce proto-cyanuret of potassium and iron to coarse powder, half fill a retort with it, place the retort in a good reverberatory furnace, adapt the tube to collect the gas; heat moderately, to expel the water of crystallization, then raise the temperature so as to fuse the mass, which will be announced by a disengagement of gas; keep up the temperature, so that the disengagement will be regular and moderate; increase the heat progressively, and maintain it at a very high degree for a quarter of an hour, close the extremity of the tube, close also the apertures of the furnace, and leave the whole to cool; then break the retort and carefully detach the upper stratum, which forms a kind of well-fused enamel. This is the pure cyanide of potassium; include in a well-ground stoppered bottle, remove afterward the spongy black mass which is found in the lower part; it is a mixture of cyanide of potassium, iron, and charcoal; include it also in bottles." Mr. Donovan, of Dublin, has added the following directions to the above process: The retort should be of forged iron; a quicksilver bottle will answer perfectly, provided it be sound; in its screw plug must be fitted an iron tube, so bent that its other extremity may be plunged half an inch below the surface of a little water in a cup. By this means the different steps may be more easily regulated, as the issue of gas is more conveniently observed. The iron bottle should be only half filled with recrystallized ferrocyanide of potassium; and as soon as the process is completed, when cold, it may be cut in two by a chisel and heavy hammer. The black, impure cyanide at the bottom of the retort is totally unfit for medicinal use.

P. P.—Cyanide of potassium, thus procured, is a whitish, semi-transparent, crystalline mass, having an enamelled appearance. It is inodorous when quite dry, but if moistened it emits the odour of hydrocyanic acid. It has an acrid, alkaline, somewhat bitter taste.

C. P.—It is composed of one eq. of potassium, and one of cyanogen. Exposed to the air, it absorbs moisture and deliquesces slowly, being converted into carbonate of potash by the absorption of carbonic acid from the atmosphere, and the evolution of hydrocyanic acid; it is fusible without change by heat, and unalterable even by a white heat, provided air be excluded. This salt is very soluble in water, but is insoluble in strong alcohol. By solution in water it is converted into the hydrocyanate of potassa.

Adulterations.—As commonly met with in the shops, this salt is seldom fit for medicinal use. When pure it should be perfectly white, and afford a perfectly colourless solution with distilled water; if it be at all yellow, it contains iron, which diminishes much its activity. It should also be perfectly free from odour, as, if it have any smell of prussic acid, it contains water, is of uncertain strength, and is, perhaps, undergoing slow decomposition.

Th. E.—Cyanide of potassium possesses precisely similar properties to the hydrocyanic acid, as a substitute for which it is used in medicine. Its advantages over that acid are its unvarying strength, and its permanence of constitution, when properly prepared and carefully preserved; but its great liability to deliquesce has prevented its general introduction into the practice of medicine. To remedy this defect, Mr. Donovan has suggested "that consumers should keep the cyanide of potassium in small, wide-mouthed, well-stoppered bottles, not quite filled with the salt, but completely filled with alcohol of 0·800; which, when of this strength, exerts scarcely any solvent power on the cyanide, but will effectually preserve it from the deteriorating influence of the air. When a few grains are required for use, they may be drawn up by an iron wire like potassium out of naphtha, and heated in a spoon for a moment, to drive off the adhering alcohol."

D. & M. of Adm.—The dose of the pure cyanide of potassium is from one eighth to one fourth of a grain. If it be desirable to administer the prussic acid contained in the salt in a free state, this may be done by prescribing it in combination with any weak acid, as with citric acid, recent lemon juice, or sirup of lemons.—*Sirup of Cyanide of Potassium*, Magendie. (Cyanide of potassium, gr. viij.; simple sirup, f℥xvj.; mix.) Dose, f℥ij. to f℥vj. It is always better to prescribe this preparation in the form of draughts, in consequence of its liability to become decomposed.—*Calmative Lotion*, Trousseau. (Cyanide of potassium, gr. viij.; distilled water, alcohol, and sulphuric ether, of each, f℥i.; mix.) For external use only. One eighth of a grain of pure cyanide of potassium is equal to about one minim of the medicinal prussic acid of the Dublin Pharmacopœia.

Incomp.—All acids, and acidulous salts.

Tabacum, L. E. Nicotiana tabacum, folia, D. *Tobacco Leaves* (*dried*, L.) *of Nicotiana Tabacum.*—A native of America, belonging to the natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—A viscid, herbaceous annual; stem 3 to 6 feet high, erect, branching at the top; leaves sessile, ovato-acuminate, very large, pale green; flowers in panicles, rose-coloured; capsules two-celled, loculicidal; containing many small, somewhat reniform, brown seeds.

M. of Prep.—In the month of August the plants are cut off above their roots, and dried under sheds; when perfectly dry, the leaves are stripped off, twisted, tied in bundles, and packed with great compression into hogsheads for exportation. Virginia tobacco in leaf should be the kind employed for medicinal purposes.

P. P.—Virginia tobacco leaves are of a dark-brown colour, with yellowish spots, and have an unctuous feel. Their odour is peculiar, heavy, and narcotic; their taste bitter and nauseous.

C. P.—It is composed of a peculiar, liquid, colourless, volatile alkaloid, which has been named *nicotina;* of a concrete volatile oil, *nicotianin;* of bitter extractive, gum, chlorophylle, vegetable albumen, gluten, starch, malic acid, and some salts. Its properties depend on the alkaloid and the volatile oil; the former is heavier than water, has the odour of tobacco, and an acrid, burning taste, so intense as to communicate it perceptibly to 10,000 parts of water; the latter has also the odour of tobacco; its taste is bitter and aromatic, leaving an unpleasant sensation in the throat; it does not exist in recent tobacco leaves, and, therefore, must be developed during the process of drying. An *empyreumatic oil* is produced by burning tobacco from the decomposition of some of its constituents; it is usually found in pipes which have been used some time for smoking; it is a very active poison. Tobacco leaves yield their properties readily to boiling water, alcohol, and spirituous liquors.

The adulterations of tobacco are unimportant in relation to its medical employment.

Th. E.—Tobacco, taken internally in large doses, acts as a powerful narcotico-acrid poison; the most marked symptoms are nausea, fainting, great exhaustion, general relaxation both of the voluntary and involuntary muscles, extreme depression of the circulatory powers (marked by the feeble, fluttering pulse, cold extremities, paleness of the face, &c.), convulsions, paralysis, and death. In very small doses it is said to act as a diuretic, and sometimes as a laxative. In full medicinal doses, it operates as a direct sedative of the vascular system, and also of the cerebral functions. It is principally used in medicine to relax the muscular fibres: thus, it is employed in the form of enema, in strangulated hernia, in stricture or obstruction of the bowels from other causes, in retention of urine from spasmodic stricture of the urethra, or from spasm of the neck of the bladder, in obstinate constipation, in severe colic, and in tetanus; in all of which diseases its beneficial effects depend on its relaxing influence over the muscular system. Tobacco was formerly employed as a diuretic in dropsy, and also as an anthelmintic, but in the present day it is rarely used for either purpose. As an external agent, the infusion or decoction may be applied by

means of compresses in any of the cases above enumerated in which its sedative action is indicated; and in America an ointment is used in chronic cutaneous diseases, especially those of the scalp, but its use requires very great caution, as it has in some instances produced fatal results; for the same reason, although a certain application for the destruction of vermin, the infusion of tobacco is but seldom employed for that purpose.

D. & M. of Adm.—The use of tobacco requires great caution, as, in order to produce a sedative influence, its poisonous effects must be partially induced. For the preparation of an enema of tobacco, formulæ are given in the three British Pharmacopœias, but in no instance should a larger quantity be used at first than from gr. xv. to gr. xx. infused in Oi. of boiling water, for cases are on record where so small a quantity as 3j., and even 3ss., have proved fatal.—*Enema Tabaci*, L. E. *Infusum Tabaci*, D. (Tobacco, 3i. (gr. xv. to 3ss., E.); boiling water, *by measure*, ℔j. (Oj., L.; f℥viij., E.); macerate (digest in a close vessel, D.) for one hour (half an hour, E.), and strain.)—*Vinum Tabaci*, E. (Tobacco, 3j.; sherry, f℥xij.; digest for seven days; strain, express strongly the residuum, and filter the liquors.) Sedative and diuretic, but rarely used. Dose, min. x. to min xl.

[U. S. P.—*Tobacco Ointment.* Fresh tobacco, cut in pieces, 1 oz.; lard, a pound. Boil the tobacco in the lard over a gentle fire till it becomes friable, then strain through linen. An excellent application in tinea capitis, and various obstinate eruptions upon the skin, but requires caution in its use.]

In cases of poisoning with tobacco, if the poison have been swallowed, emetics should be immediately administered; and in all cases the most powerful stimulants, both external and internal, should be employed. The vegetable astringents have been proposed as antidotes for tobacco, tannin forming an insoluble precipitate with *nicotina.*

Zinci cyanidum. *Cyanide of Zinc.* (*Cyanuret of Zinc; Hydrocyanate of protoxyde of Zinc.*)

Prep.—Pass the vapour of prussic acid into distilled water in which is suspended recently-prepared hydrated oxyde of zinc, which is obtained by adding in excess water of caustic potash to a solution of chloride of zinc.

P. & C. P.—It is a solid white salt, inodorous and insipid; is composed of one eq. of cyanogen, and one of zinc; and is insoluble in both water and alcohol.

Th. E.—This preparation has been proposed on the Continent as a substitute for hydrocyanic acid or the cyanide of potassium. The dose is from gr. $\frac{1}{4}$ to gr. j., but its insolubility renders it an objectionable preparation. In Germany it has been employed as an *anthelmintic* for children.

[Zinci Ferro-hydrocyanas (*Ferro-hydrocyanate of Zinc*).

Prep.—Mix together, for mutual decomposition, solutions in water, at the boiling temperature, of 83 parts of sulphate of zinc and 60 parts of ferrocyanate of potassa;

adding more of the sulphate of zinc if the bluish colour is present, and then digest until the precipitate is entirely white.

P. & C. P.—It is a white, insoluble, almost inodorous powder, somewhat soluble in the stronger acids, without exhaling a smell of hydrocyanic acid in the cold; but by boiling, that acid is slowly disengaged.

Th. E.—Adapted to nervous diseases, cardialgia, epilepsy, paralysis, chorea, neuralgia, and spasmodic affections generally, in which it is often an efficient remedy in American practice.

D. & M. of Adm.—The dose should begin with 1 grain in ordinary, though from 2 to 6 grs. have been given in cramp of the stomach at a dose. When the small dose is given, it should be repeated 3 or 4 times a day, and gradually increased. It is best given in pill or powder, being insoluble. As this article is often confounded with the more active cyanide of zinc, it should be distinguished in prescriptions by calling the one zincum hydrocyanicum *sine ferro*, and the other zincum *ferro*-hydrocyanicum.

It has been recommended as a collyrium in scrofulous opththalmia, catarrhal and rheumatic affections of the eyes, &c., and for this purpose is suspended by mucilage of gum-arabic, and modified by tincture of opium, in the proportion of 1 to 3 grs. to the oz.]

[Zinci iodidum (*Iodide* or *Ioduret of Zinc*).

Prep.—Boil together iodine and zinc in atomic proportions, or, rather, with an excess of zinc, in a flask of water, down to dryness, and sublime the residue.

P. & C. P.—It forms beautiful, colourless, prismatic crystals. It is, however, very deliquescent, and cannot easily be retained in the solid form, and is liable to undergo spontaneous decomposition. By being heated in open vessels, it is resolved into iodine and oxyde of zinc.

Th. E.—It is used externally, for the same purposes as iodide of potassium, the unguent being composed of 1 drachm to an oz. of lard. As a collyrium and injection, 1 gr. to the oz. of water is a valuable astringent.]

CHAPTER XVIII.

SIALOGOGUES.

(Masticatories.)

Sialogogues are substances which, by a *local* stimulant action, augment the secretion of saliva. By this definition we exclude the so-called *remote* or *specific* sialogogues, as the preparations of mercury, gold, &c., which generally produce an increased flow of saliva, when their internal use has been continued for some time; but, as their remediate powers do not depend merely on the in-

crease of this secretion, it will, I think, be more practical to confine the term *sialogogue* to those agents which are employed as direct stimulants to the salivary glands. There are but few substances used in the present day in the practice of medicine for this purpose, and their application to the treatment of disease is very limited.

Armoracia, L. E. Cochlearia armoracia, radix, D. *Horse-radish. The fresh root of Cochlearia armoracia.*—Indigenous, belonging to the natural family *Cruciferæ*, and to the Linnæan class and order *Tetradynamia Siliculosa.*

B. C.—Roots perennial, fleshy, white, running deep into the ground; stems about 2 feet high; leaves large, much veined; flowers white.

P. P.—When bruised or cut, the fresh root emits a very acrid, penetrating odour; it has a very pungent taste. The acrimony of the roots is lost by drying, but they may be preserved fresh for a long time by keeping them packed in sand in a damp cellar.

C. P.—Its active principle is a very acrid volatile oil, which may be obtained by distillation. The root yields its acrimony to both boiling water and alcohol; but it is dissipated by boiling.

Th. E.—Horse-radish root is an excellent sialogogue, producing a copious secretion of saliva. It has been sometimes employed in paralysis of the tongue, but, like the other remedies of this class, it has nearly fallen into disuse.

Mezereon (described in the division *Diaphoretics*) has been occasionally used as a masticatory in toothache and in difficulty of deglutition from paralysis. A small piece of the bark should be frequently chewed, and the saliva assiduously rejected.

Pyrethrum, D. L. E. *Pellitory of Spain. Root of Anacyclus Pyrethrum*, E.—*of Anthemis Pyrethrum*, D. L.—A native of Asia Minor, and of the central parts of Europe, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua.*

B. C.—Root fusiform; stems several, procumbent, somewhat branched, pubescent; branches one-headed; florets of the ray, white above, purplish beneath; of the disc, yellow.

P. P.—It is in short tapering pieces, from 3 to 4 inches in length, and about the thickness of the little finger. The bark is thick, and of a dark-brown colour, with black shining spots; the internal structure is dirty yellow, with a radiated appearance. It is inodorous, but when chewed produces a peculiar pricking sensation on the tongue and lips.

C. P.—According to Parisel's analysis, the acrimony of this root depends on an acrid resin, *Pyrethrin*, of which it contains 3 per cent.: the other constituents are, inulin, gum, tannin, colouring matter, lignin, a trace of iron and silica, and some salts. It yields its virtues to alcohol and ether, but not to water.

Th. E.—Pellitory root is the most useful of this class of remedies, acting as a powerful local stimulant to the salivary glands, and

causing a copious secretion of saliva. It is used for this purpose in toothache, neuralgia of the face, and paralysis of the tongue. It has also been employed in relaxation of the uvula. From 3ss. to 3i. of the root may be chewed frequently. A tincture prepared by macerating for 7 days one part of the powdered root in five parts of rectified spirit and one of water, is used by some dentists to relieve toothache.

CHAPTER XIX.

GENERAL STIMULANTS.

(Excitants—Incitants.)

It is difficult to define what is understood in the practice of medicine by the term Stimulant, excitement of the vital energies is produced by such different means under different circumstances; with no class of remedies, therefore, is it more necessary to bear in mind the truth of the maxim, that medicines act merely relatively. In their mode of action when administered internally, general stimulants resemble in some respects tonics; thus, immediately after their administration, a feeling of tone or increased power is produced, which, however, is not permanent, but is almost invariably followed by a corresponding depression of vital power; their effects, also, are more immediate and more manifestly perceived by the senses than those of tonics. Many of the remedies contained in this division are closely related to narcotics, for example, alcohol and the ethers; the secondary effect of both of which, particularly if given in large doses, is to produce sleep and coma; this does not, however, appear to be, as with narcotics, from any direct action on the nervous system, but rather to result from the previous over-excitement of the vital energies. The great number of medicines contained in this class, and the material difference of their action in relation to the particular effects which they produce on the animal economy, preclude us from laying down any general rule as to their administration in disease. The peculiarities in their mode of operation will be more conveniently considered when treating of the therapeutical effects of each article.

[The difficulties which environ the whole subject of nomenclature in the department of the Materia Medica are so obvious, and confessedly so insurmountable in the present state of our science, that a failure to classify or designate with accuracy the precise modus operandi of any drug or group of articles employed in medication, may be ascribed rather to the inherent difficulties and intricacies of the subject, than to any deficiency of science or skill in the author. It is not intended even to imply the latter in the present case, but we cannot withhold the expression of dissent from the

fitness of the title given to the class of agents here to be considered. They are not all *stimulants*, much less are they all *general* in their action. Some of them, indeed, are "*special* stimulants," as these are defined in the next chapter, to which they more properly belong, if the classification here adopted be retained.

While the student will see cause, therefore, to admire the ingenuity of the author in the divisions he has made in this volume, and will find facilities for acquiring a knowledge of the subject thereby furnished, he needs to be on his guard in implicitly relying on the significance and accuracy of the terms here employed to designate the differences between the various agents employed in medication. In the note prefixed to the next chapter, he will find a few hints suggested as material for reflection on this topic.]

ACIDUM ACETICUM CAMPHORATUM, D. E. *Camphorated acetic acid.*—An officinal substitute for aromatic vinegar.

PREP.—"Camphor, ʒss.; acetic acid, fʒvj. (fʒviss., E.); pulverize the camphor with the aid of a little rectified spirit, and dissolve it in the acetic acid."

This preparation is only employed as an external stimulant, the vapour being snuffed up the nostrils in syncope. It is exceedingly pungent and very volatile, and should, therefore, be kept in well-stopped bottles.—*Aromatic vinegar* of the shops is a solution of camphor, and the volatile oils of cloves, lavender, and rosemary, in the strongest acetic acid; its odour is more agreeable than that of the officinal preparation.

ACIDI NITRICI UNGUENTUM, D. *Nitric acid ointment.*—This ointment is employed as a local stimulant in chronic cutaneous diseases, particularly those which affect the scalp, and as an application to ulcers of a syphilitic origin. It is said to be most efficacious when recently prepared.

PREP.—*Dub.* "Olive oil, ℔j.; prepared hog's lard, ʒiv.; nitric acid, fʒvss.; melt the oil and lard together in a glass vessel, and when they are beginning to concrete, add the acid, then stir constantly with a glass rod until they become firm."

ÆTHER ACETICUS. *Acetic ether.*—Not employed in Great Britain, but officinal in most of the Continental Pharmacopœias.

PREP.—*Parisian Codex.* "Rectified spirit, 100 parts; concentrated acetic acid, 63 parts; strong sulphuric acid, 17 parts; mix, and distil over with a gentle heat, 125 parts; deprive this of any free acetic acid it may contain by means of carbonate of potash, set aside until it settles, pour off the clear liquor, and distil 100 parts."

P. P.—It is a colourless, transparent, very volatile liquid, with an agreeable, refreshing odour, and a warm, ethereal taste, leaving a cooling impression on the palate. Sp. gr., 0·860.

C. P.—According to the recent chemical theories as to the constitution of the ethers, acetic ether is an *acetate of oxyde of ethyl;* its composition is $C^8H^8O^4$ or $C^4H^5O+C^4H^3O^3$; it boils at 165°. It is soluble in 7 parts of water, and in alcohol and ether in all proportions. Acetic ether, when free from water, may be kept unchanged in stoppered bottles, but if it contain water, it rapidly de-

composes into acetic acid and alcohol; the alkalies decompose it with great facility.

Th. E.—Acetic ether is an agreeable but mild general stimulant, at one time much used on the Continent in hysteria and nervous affections; at present it is chiefly employed externally as an ingredient in stimulating liniments.—*Camphorated Acetic Liniment*, Pelletier. (Soap and camphor, of each, ʒij.; acetic ether, fʒij.; dissolve in a water-bath, and add oil of origanum, min. xx.) An excellent stimulating liniment in rheumatic and arthritic pains, and in sciatica.

Æther nitrosus, D. *Nitrous ether. Hyponitrous ether; Nitric ether; Nitrite of oxyde of ethyl.*

Prep.—*Dub.* "Take of nitrate of potash, purified, dried, and reduced to coarse powder, ℔iss.; sulphuric acid, ℔i.; rectified spirit, *by measure*, ʒxix.; put the nitre into a tubulated retort placed in a bath of cold water, and pour on it gradually and at intervals the sulphuric acid and the spirit, previously mixed and cooled. Without any heat, or, at most, a very gentle one (as of warm water added to the bath), an ethereal liquor will begin to distil; and in a short time the heat in the retort will spontaneously increase, and brisk ebullition take place, which is to be moderated by adding cold water to the bath; the receiver must ke kept cold with water or snow, and must be fitted with a proper apparatus for transmitting the very elastic vapour from the mixture (which sometimes bursts forth with great violence if the heat be much increased) through ℔j. of rectified spirit contained in a cooled bottle. The ethereal liquor, thus spontaneously distilled, is to be received in a bottle with a glass stopper, and add to it gradually (closing the bottle after each addition) a sufficient quantity of dry carbonate of potash to saturate the excess of acid, litmus paper being used as a test; this is effected by about a drachm of the salt, and after a short interval the nitrous ether will float on the top, and is to be removed by means of a funnel. If the ether be required very pure, distil it again to one half from a water-bath at a temperature of 140°. Its specific gravity is to that of distilled water as 900 to 1000."

P. P.—Nitrous ether is a volatile liquid, of a pale-yellow colour, with an agreeable, very fragrant odour, and a sweetish, cooling, somewhat acid taste. When quite pure, its sp. gr. is ·947 at 59° F.

C. P.—Its composition is $C^4H^5O^4N$ or $C^4H^5O+NO^3$. It boils at 70°, and is very inflammable, burning with a bright flame. It requires for its solution 48 parts of water, but is miscible in all proportions with alcohol and ether. It is readily decomposed by the alkalies.

Th. E.—Nitrous ether is a general stimulant, resembling in its operation sulphuric ether; but, in consequence of the difficulty of preparing, as well as its tendency to decompose by keeping, it is seldom if ever used in the present day. The dose of it would be from min. x. to min. xxx., frequently repeated.—*Spirit of Nitric Ether* (described in the division *Diuretics*) is sometimes employed as a stimulant in flatulent colic and in spasmodic vomiting, in doses of from fʒss. to fʒj., repeatedly.

Æther sulphuricus, D. L. E. [and U. S. P.]. *Sulphuric ether. Ether. Oxyde of ethyl.*

Prep.—*Dub.* "First prepare *sulphuric ethereal liquor* as follows: Take of rectified spirit and sulphuric acid, of each, ʒxxxij. *by weight*; put the spirit into a glass retort that will bear the sudden application of heat, and pour on it the acid in a steady

stream; mix them gradually, and distil with a sudden and sufficiently strong heat, ℥xx. *by measure* of the liquor into a cool receiver. If ℥xvj. of rectified spirit be poured on the acid remaining in the retort, more sulphuric ethereal liquor will be obtained by distillation. Take of this liquor, f℥xx.; carbonate of potash, dried and powdered, ℥ij.; mix them, and from a very high retort distil with a very gentle heat into a cooled receiver f℥xij. The specific gravity of the liquor should be to that of distilled water as 765 to 1000." *Lond.* "Take of rectified spirit, ℔iij.; sulphuric acid, ℔ij.; carbonate of potash, previously ignited, ℥i.; pour ℔ij. of the spirit into a glass retort, add the acid to it, and mix. Afterward place it on sand, and raise the heat so that the liquor may quickly boil, and the ether pass into a receiving vessel cooled with ice or water; let the liquor distil until some heavier portion begins to pass over. To the liquor which remains in the retort after the heat has subsided pour the remainder of the spirit, that ether may distil in the same manner; mix the distilled liquors, then pour off the supernatant portion, and add to it the carbonate of potash, shaking them frequently during an hour. Lastly, let the ether distil from a large retort, and be kept in a stopped vessel." *Edin.* "Take of sulphuric acid, f℥x.; rectified spirit, f℥l.; pour f℥xij. of the spirit gently over the acid in an open vessel, and then stir them briskly and thoroughly; transfer the mixture immediately into a glass matrass connected with a refrigeratory, and raise the heat quickly to about 280°. As soon as the ethereal fluid begins to pass over, supply fresh spirit through a tube into the matrass in a continuous stream, and in such quantity as to equal the volume of the fluid which distils over. This is best done by connecting one end of the tube with a graduated vessel containing the spirit, passing the other end through a cork fitted into the matrass, and having a stopcock on the tube to regulate the discharge. When the whole spirit has been added, and f℥xlij. have distilled over, the process may be stopped; agitate the impure ether with f℥xvj. of a saturated solution of muriate of lime, containing also ℥ss. of lime recently slacked. When all odour of sulphurous acid has disappeared, pour off the supernatant liquid, and distil it with a gentle heat so long as what passes over has a density not higher than 735. More ether of equal strength may be obtained from the muriate of lime; and from the residuum of each distillation a weaker ether may be obtained in small quantity, which must be rectified by distilling it gently again."

P. P.—Ether is a transparent, colourless, very mobile liquid, with a fragrant, penetrating odour, and a pungent, aromatic taste, leaving a sense of coldness on the tongue. The sp. gr. of the London preparation is ·750.

C. P.—Its composition is C^4H^5O or EO. It is extremely volatile; it boils between 96° and 98°; is highly combustible, burning with a white flame and the formation of carbonic acid and water. Great cold is produced by its evaporation. When recently prepared, ether is perfectly neutral, but soon becomes acid by keeping. One part of ether dissolves in 10 parts of water, while 36 parts of ether dissolve 1 of water; it combines in all proportions with alcohol. It dissolves most resins, the volatile oils, and many of the vegetable alkaloids.

Adulterations.—Ether frequently contains water and alcohol; from bad keeping, acetic acid is also often present. The latter may be detected by the effect on litmus paper, and water by the density being higher than that indicated by the colleges. The presence of alcohol, as well as the quantity, if it be present, is satisfactorily ascertained by the test of the *Edin. Phar.* "When agitated in a minim measure with half its volume of concentrated solution of muriate of lime, its volume is not lessened." If the solution of ether in water be not perfectly transparent, the presence of ethereal oil may be suspected.

Tu. E.—The action of sulphuric ether, when taken internally, is that of a general diffusible stimulant; its effects, which are rapidly

produced, are equally transient. In very large doses it is a narcotic poison, producing death, with symptoms similar to those caused by alcohol. Applied externally, its action is refrigerant, owing to the cold produced by its immediate evaporation. As a stimulant, ether is chiefly employed in spasmodic and nervous affections unaccompanied with inflammation; thus, it is employed with benefit in cramp of the stomach, in spasmodic or flatulent colic, in nervous palpitations, in hiccough, in nervous headache, during a paroxysm of spasmodic asthma, &c. It is also administered frequently, with good effect, in the advanced stages of fever, when subsultus tendinum and hiccough are present; and as an immediate stimulant in fainting and asphyxia. In the employment of ether as a stimulant, the transient nature of its operation should be borne in mind, and, consequently, that the doses require to be repeated at short intervals. The influence of ether over the system is much diminished by habit, therefore those who are accustomed to its use should take it in much larger doses. Externally, it has been applied with friction as a local stimulant in rheumatic and neuralgic pains. In pharmacy, ether is employed to extract the active principles of many medicines.

D. & M. OF ADM.—f℥ss. to f℥ij.; it is usually administered in some aromatic water. "Ether may be readily incorporated with water or any aqueous vehicle by rubbing it up with spermaceti, employed in the proportion of gr. ij. for each fluid drachm of the ether" (*U. S. Dispensatory*). The vapour of ether, disengaged by adding it to some warm water, is inhaled in spasmodic affections of the respiratory organs.—*Spiritus Ætheris Sulphurici*, E. (Sulphuric ether, Oj.; rectified spirit, Oij.; mix them together. "Density, 809; it does not affect litmus paper or render water muddy; when agitated with twice its volume of concentrated solution of muriate of lime, 28 per cent. of ether separate by rest.") Uses and properties similar to those of ether. Dose, f℥i. to f℥iij. It is miscible with water in all proportions.—*Liquor Æthereus Oleosus*, D. *Oleum Æthereum*, L. ("Take what remains in the retort after the distillation of sulphuric ether, and distil down to one half with a moderate heat," D. "Rectified spirit, ℔ij.; sulphuric acid, ℔iv.; solution of potash and distilled water, of each, f℥i., or as much as may be sufficient; mix the acid cautiously with the spirit. Let the liquor distil until a black froth arises, then immediately remove the retort from the fire, separate the lighter supernatant liquor from the heavier one, and expose the former to the air for a day; add to it the solution of potash first mixed with water, and shake them together. Lastly, when sufficiently washed, separate the ethereal oil which subsides," L.) This preparation is only employed as an ingredient in the following compound: *Spiritus Ætheræus Sulphurici comp.*, L. (Sulphuric ether, f℥viij.; rectified spirit, f℥xvj.; ethereal oil, f℥iij.; mix.) Commonly known as *Hoffman's Anodyne Liquor;* its uses and properties are similar to those of sulphuric ether; the dose is f℥ss. to f℥ij. It is miscible with water in all proportions. This preparation is often prescribed in

combination with laudanum, the disagreeable subsequent effects of which it is said to prevent.

In cases of poisoning with ether, the stomach pump should be immediately had recourse to; cold affusion, and the most powerful internal and external stimulants, assiduously employed; in extreme cases, artificial respiration should be effected.

ALCOHOL, D. L. E. *Absolute alcohol of the density* 794–6, E. *Alcohol with a small proportion of water, density* 810, D.; 815, L.

PREP.—*Dub.* "Rectified spirit, cong. j.; pearlashes, dried and still warm, ℔iiiss.; muriate of lime, dried, ℔j.; add the pearlashes in powder to the spirit, digest the mixture in a close vessel, frequently agitating, for 7 days; draw off the supernatant spirit, and mix it with the muriate of lime. Lastly, distil with a medium heat until the mixture in the retort begins to thicken." *Lond.* "Rectified spirit, cong. j.; chloride of calcium, ℔j.; put the chloride of calcium into the spirit, and when it is dissolved, let Ovij. f℥v. distil." *Edin.* "Rectified spirit, Oj.; lime, ℥xviij.; break down the lime into small fragments, expose the spirit and lime together to a gentle heat in a glass matrass till the lime begins to slack; withdraw the heat till the slacking be finished, preserving the upper part of the matrass cool with damp cloths; then attach a proper refrigeratory, and with a gradually increasing heat distil off f℥xvij. The density of the alcohol should not exceed 796; if higher, the distillation must have been begun before the slacking of the lime was altogether finished."

P. P.—Alcohol is a transparent, colourless liquid, with a pungent, rather agreeable odour, and an acrid, burning taste. Its density varies with the quantity of water it contains; that of the strong spirit of the pharmacopœias has been given above. RECTIFIED SPIRIT (*Spiritus rectificatus*, D. L. E.) is an article of the Materia Medica; the Dublin College fixes its specific gravity at ·840 at 60° F.; the London College at ·838 at 62° F.; and the Edinburgh College at ·838 at 60° F.—PROOF SPIRIT (*Spiritus tenuior*, D. L. E.) is also an article of the Materia Medica, but, as met with in commerce, it is unfit for medical use, in consequence of its containing essential oil. The three colleges have, therefore, directed it to be prepared "by mixing together $5\frac{1}{4}$ parts, *by measure* (Ov., L.; Ovj., E.), of rectified spirit, with 3 parts, *by measure* (Oiij., L. E.), of distilled water, at a temperature of 60° (62°, L)." Its specific gravity, according to the laws of the kingdom, is 920 at 60° F.; and it is obtained of this strength by the directions of the London College; the Dublin College fixes it at ·919, the Edinburgh at ·912, at 60° F.

C. P.—Absolute alcohol is a *Hydrated oxyde of ethyl;* its composition is C^4H^5O+HO or EO+HO. It boils at 173°; it is highly inflammable, and burns with a pale blue flame, free from smoke, water and carbonic acid being the products of its combustion; it has never been frozen. It attracts water from the air, and therefore becomes weak if kept in an imperfectly-closed vessel; it is miscible with water in all proportions, a disengagement of heat, a diminution of bulk, and an increase of density accompanying their union. Alcohol dissolves the caustic alkalies and alkaline sulphurets; it also dissolves all the deliquescent inorganic salts, except carbonate of potash, but none of the salts which are insoluble or sparingly soluble in water, nor efflorescent salts. It likewise dis-

solves many vegetable substances, as all essential and most fixed oils, the vegetable alkaloids, sugar, resins, extractive, &c., for many of which purposes it is employed in pharmacy. Alcohol prevents the putrefaction of animal substances which are immersed in it, and hence its employment in the preservation of anatomical preparations. *Rectified* and *Proof spirit* have similar properties to alcohol; their taste is milder, their boiling point higher according to the state of dilution, their inflammability less, and the colour of the flame with which they burn deeper yellow the more water they contain. *Proof spirit* is defined by law to be such that, at the temperature of 51° F., 13 volumes of it weigh exactly as much as 12 volumes of water; 100 parts of spirit of this strength consist of 49 parts by weight of absolute alcohol, and 51 parts by weight of distilled water at 60° F.

Adulterations.—The specific gravity is a sufficient test of the strength of alcohol and the weaker spirits, but, in ascertaining their density, the temperature should be at the same time carefully noted, for the lower the temperature, the greater will be the density of the spirit. The rectified spirit of British commerce frequently contains *oil of grain*, a contamination derived from the corn during the process of distillation. Its presence is readily detected by the test of the *Edin. Phar.:* "fʒiv. treated with 25 minims of solution of nitrate of silver (gr. j. to gr. xl. of water), exposed to bright light for 24 hours, and then passed through a filter purified by weak nitric acid, so as to separate the black powder which forms, undergo no farther change when again exposed to light with more of the test." The same test is applicable to both alcohol and proof spirit.

Th. E.—Alcohol is the intoxicating principle of all spirituous liquors; in moderate doses, properly diluted, it acts as a general stimulant, exciting particularly the vascular and nervous systems; in somewhat larger doses, it produces the well-known effects of intoxication; and in excessive doses it acts as a powerful narcotic poison, rapidly causing death, preceded by slow pulse, contracted pupils, and coma. This effect is most usually observed when a large quantity of ardent spirits has been drank at once. As a stimulant, alcohol is employed in medicine to support the vital powers in the advanced stages of fevers, particularly those of a typhoid character; for this purpose brandy or whiskey are usually employed, but wine is generally preferred. (See *Vinum.*) It is also often used in flatulent colic, in indigestion, in vomiting, and in fainting. As an external stimulant, it is a common ingredient in lotions for sprains and bruises, for many forms of external inflammations, as erysipelas and erythema, for various skin diseases, to prevent excoriations in parts exposed to prolonged pressure, and with friction over the region of the heart in syncope and suspended animation. Diluted with six parts, *by measure*, of water, it has been used as an injection after tapping for the radical cure of *hydrocele*. In consequence of its producing cold by its evaporation, alcohol is frequently added to cooling and evaporating lotions.

D. & M. of Adm.—In fevers, brandy or whiskey is given in the

form of punch; the quantity which should be given depends so much on the circumstances of each particular case, that it would be impossible to lay down any general rule on the subject here. In the fever which proved so fatal to the British Legion in Spain in the year 1835, Dr. Lardner frequently gave so much as 32 ounces of brandy in the 24 hours.—*Mistura spiritus vini gallici*, L. (Brandy, cinnamon-water, each, f℥iv.; the yolks of two eggs; purified sugar, ℥ss.; oil of cinnamon, min. ij.; mix.) An agreeable and excellent stimulant, in doses of f℥ss. to f℥iss.

In poisoning with ardent spirits, the contents of the stomach should be immediately evacuated by means of the stomach-pump, and external stimuli, especially the cold affusion, assiduously employed. The coma of ordinary intoxication is best treated by the internal use of ammonia, or of the solution of the acetate of ammonia; if apoplectic symptoms be present, cold lotions to the head, the application of leeches to the temples, and warmth to the extremities, will be found most useful.

AMMONIACUM, L. E. AMMONIACUM GUMMI, D. *Gum ammoniac. Gum-resin* (*Gummy resinous exudation, E.*) *of Dorema Ammoniacum*, L. E.—*of Heracleum Gummiferum*, D.—The plant indicated by the London and Edinburgh Colleges, which is the true source of this drug, is a native of Persia, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia*.

B. C.—A glaucous-green plant, 4 to 7 feet high; stem about 4 inches in diameter, branching; leaves large, 2 feet long, on downy petioles, sheathing at the base; flowers white, in proliferous, racemose umbels.

P. U. & M. OF PREP.—The gummy juice which pervades the whole plant oozes forth on the slightest puncture. During the warm season, the branches and stem are attacked by innumerable beetles, by which it is pierced in all directions; through these punctures the juice exudes, and soon concretes into a hard gum, when it is picked off by the country people.

P. P.—Ammoniac is met with in various-sized, roundish tears, or in masses composed of the tears agglutinated together. They are of a yellowish or reddish-yellow colour externally; internally they are white and shining like enamel, hard and brittle, and vary in size from that of a small pea to that of a walnut. The odour is peculiar, faintly nauseous, more powerful when heated; the taste is bitter and disagreeable.

C. P.—Ammoniac is a gum-resin containing about 80 per cent. of resin, and about 18 per cent. of gum, with a trace of volatile oil. It is softened by exposure to heat, is inflammable, and burns with a white flame. It does not dissolve in water, but is miscible with it, forming a milky emulsion, the gum, which is soluble, suspending the resin in the mixture. It is soluble in both ether and alcohol.

TH. E.—Ammoniac is a general stimulant of but little power; its effects were at one time generally believed to be chiefly manifested on the respiratory organs, and, consequently, it was classed among expectorants, and employed in chronic bronchitis. It possesses some antispasmodic powers, but is much inferior as such to

the other fetid gum-resins. In the present day it is very generally and very properly employed only as an external stimulant, in the form of plaster, to scrofulous tumours, chronic enlargement of the joints, indolent glandular swellings, &c., in which it often proves useful.

D. & M. OF ADM.—Gr. x. to ʒss., in pills, or made into an emulsion with milk or water.—*Mistura Ammoniaci*, D. L. ("Gum-ammoniac, ʒj.; pennyroyal water, fʒviij.; rub the gum with the pennyroyal water gradually poured in, until the mixture assumes the appearance of milk, and strain through linen," D. "Ammoniacum, ʒv.; water, Oj.; rub the ammoniacum with the water gradually poured in, until they are perfectly mixed," L.) Dose, fʒss. to fʒj. —*Emplastrum Ammoniaci*, D. L. E. ("Pure gum-ammoniac, ʒv.; vinegar of squill, ℔ss.," D. "Ammoniacum, ʒv.; distilled vinegar, fʒviij. (fʒix., E.)," L. E. Dissolve the ammoniacum in the vinegar; then evaporate the liquor with a slow fire, constantly stirring, to a proper consistence.—*Emplastrum gummosum*, E. (Litharge plaster, ʒiv.; ammoniac, galbanum, and bees' wax, of each, ʒss.; melt the gum-resins together, and strain them, melt also together the plaster and wax, add the former to the latter mixture, and mix the whole thoroughly.) Those plasters should be spread on leather for application; when left on for some time, they often produce an eruption of small pimples.

AMMONIÆ CAUSTICÆ AQUA, D. AMMONIÆ LIQUOR, L. AMMONIÆ AQUA, E.—*Diluted aqueous solution of ammonia* (described in the division *Antacids*) is a general stimulant, prompt, but temporary in its action. It is principally used in typhus fever where there is great deficiency of nervous power; in the advanced stages of continued fever, when all inflammatory action has subsided, in the cold stage of intermittents, in the eruptive fevers where the eruption has receded from the skin, and in the latter stages of pneumonia, if there is much depression of the vital powers. Owing to its stimulant operation, ammonia is also found useful in spasmodic affections which depend on the increased irritability that accompanies depression of the nervous system, as in hiccough, subsultus tendinum, and some forms of hysteria, and of asthma. It is the best internal stimulant that can be employed in the coma of intoxication, and in poisoning with *sedatives*. As an external stimulant, the vapour of ammonia is inhaled in syncope, and in asphyxia. Solution of ammonia may be given as a stimulant, in the same doses as directed in the division *Antacids;* but it should be given repeatedly and with short intervals.

AMMONIÆ CARBONAS.—*Sesquicarbonate of ammonia* (described in the division *Antacids*) is employed as a stimulant in the same cases as the aqueous solution of ammonia, to which it is usually preferred. The chief advantage that ammonia and the sesquicarbonate possess as stimulants in febrile diseases is, that they rouse the energies of the system, without producing that disturbance of the brain which

is liable to result from the use of vinous liquors. Dose, gr. v. to gr. xv., dissolved in camphor mixture, or any simple vehicle, every 4 or 5 hours. It should not be administered in the solid state, from its liability to produce vomiting when thus given.

Ammoniæ hydrosulphuretum, D. *Hydrosulphuret of ammonia. Hydrosulphate of ammonia.*

P. & C. P.—A greenish-yellow, very fetid liquid, emitting an odour of sulphuretted hydrogen gas, having an acrid, very disagreeable taste. It is a solution of the neutral hydrosulphate of ammonia in water. Exposed to the air, it deposites sulphur, owing to the escape of some of the ammonia; and, on the addition of any of the mineral acids, sulphuretted hydrogen gas is evolved.

Prep.—"Sulphuret of iron, in coarse powder, 5 parts; sulphuric acid, 7 parts; water, 32 parts; water of caustic ammonia, 4 parts; put the sulphuret into a retort, then gradually pour on it the acid previously diluted with water, and having fitted on a proper apparatus, transmit the gas through the water of ammonia. Towards the end of the process apply a moderate heat to the retort."

Th. E.—This preparation has nearly fallen into disuse. It was formerly employed with the idea of deoxygenizing the system in diabetes, as also of diminishing the morbid appetite of that disease. It possesses some slight stimulant properties, but might well be spared from the pharmacopœia. The dose is from min. iv. to min. vj. in distilled water.

Ammoniæ murias, D. E. Ammoniæ hydrochloras, L. *Muriate of ammonia. Hydrochlorate of ammonia. Chloride of ammonium. Sal ammoniac.*

P. P.—This salt generally occurs in large crystalline cakes, convex on one side, concave on the other, of a grayish-white colour, semi-transparent. It is tenacious, and difficult to reduce to powder; inodorous, with a pungent, acrid, bitter taste. Sp. gr., 1·45.

C. P.—It is composed of 1 eq. of chlorine, 2 of hydrogen, and 1 of amidogene, its formula being NH^2, Cl. 2 H (Kane). It is permanent in the air; exposed to heat, it sublimes unchanged. It is soluble in 2·72 parts of water at 60°, and in its own weight of boiling water: it is also soluble in alcohol. During its solution in water, a great degree of cold is produced. This salt is best characterized by the evolution of gaseous ammonia, which takes place when it is rubbed in a mortar with quicklime.

Prep.—An article of the Materia Medica. It is procured by the manufacturers, on the large scale, by decomposing the sulphate of ammonia which is formed in the manufacture of coal gas, or from the carbonate of ammonia obtained by the distillation of bones. In either case, the decomposing agent employed is common salt (chloride of sodium).

Th. E.—Hydrochlorate of ammonia is not employed in Great Britain as an internal remedy; but on the Continent, especially in France and Germany, it bears a high character as a stimulant in mucous fevers, as soon as the acute inflammatory symptoms have subsided, in the slighter cases of inflammations of the serous membranes, in the milder forms of pneumonia, and of hoopingcough, in

mucous diarrhœa, in chronic rheumatism and gout, and in passive dropsies. As a topical remedy, this salt is very generally employed as an ingredient in discutient lotions, and, in consequence of the cold produced during its solution in water, as an external refrigerant.

D. & M. OF ADM.—Internally, gr. v. to gr. xxx. combined with some aromatic powder, in the form of pill or of bolus. For external use, it may be dissolved in water or in vinegar, in the proportion of from ʒij. to ʒss. of the salt in a pint of liquid, to which rectified spirit is generally added. A refrigeratory mixture may be prepared by dissolving 5 parts each of this salt and of nitre in 16 parts of water, which will reduce the temperature forty degrees.

INCOMP.—Sulphuric and nitric acids; potash; soda; lime; and magnesia.

If an overdose of this salt has been taken, vomiting should be promoted by the use of tepid mucilaginous and demulcent drinks.

AMMONIÆ SPIRITUS, D. L. E. *Spirit of ammonia. Solution of carbonate of ammonia* (*of ammonia*, E.) *in rectified spirit.*

P. & C. P.—A transparent, colourless liquid, with a pungent, ammoniacal odour, and an acrid taste. It is very volatile, and acts as an alkali on vegetable colours. The Dublin and London preparations effervesce with the stronger acids. Sp. gr., ·860, L.; ·845, E.

PREP.—*Dub.* "Rectified spirit, *by measure*, ℔iij.; carbonate of ammonia, in coarse powder, ʒiiiss.; mix, and dissolve with a gentle heat, then filter." *Lond.* "Hydrochlorate of ammonia, ʒx.; carbonate of potash, ʒxvi.; rectified spirit and water, of each, Oiij.; mix, and let Oiij. distil." *Edin.* "Rectified spirit, Oij.; fresh-burned lime, ʒxij.; muriate of ammonia, in very fine powder, ʒviij.; water, fʒviss.; let the lime be slacked with the water in an iron or earthen vessel, and cover the vessel till the powder be cold; mix the lime and muriate of ammonia quickly and thoroughly in a mortar, and transfer the mixture at once into a glass retort; adapt to the retort a tube which passes nearly to the bottom of a bottle containing the rectified spirit; heat the retort in a sand-bath gradually so long as anything passes over, preserving the bottle cool. The bottle should be large enough to contain one half more than the spirit used."

TH. E.—Spirit of ammonia is a stimulant of some power, and may be used as such in the same cases as the aqueous solution of the gas, or of the sesquicarbonate. It is generally employed in the following form: *Spiritus Ammoniæ aromaticus*, D. L. E. ("Spirit of ammonia, *by measure*, ℔ij.; essential oil of lemons, ʒij.; nutmegs, bruised, ʒss.; cinnamon, bruised, ʒiij.; macerate in a close vessel for 3 days, shaking occasionally; then distil ℔iss.," D. "Hydrochlorate of ammonia, ʒv.; carbonate of potash, ʒviij.; cinnamon, bruised, and cloves, bruised, of each, ʒij.; lemon peel, ʒiv.; rectified spirit and water, of each, Oiv.; mix, and distil, Ovi.," L. "Spirit of ammonia, fʒviij.; volatile oil of lemons, fʒi.; volatile oil of rosemary, fʒiss.; dissolve the oils in the spirit by agitation," E.) An excellent and agreeable stimulant in fainting, hysteria, nervous debility, and flatulent colic. Dose of the simple or aromatic spirit, min. xxx. to fʒi., in distilled water or in camphor mixture.—*Tinctura Ammoniæ comp.*, L. (Mastich, ʒij.; rectified spirit, fʒix.; oil

of lavender, min. xiv.; oil of amber, min. iv.; stronger solution of ammonia, Oj.; macerate the mastich in the spirit, that it may be dissolved, and pour off the clear tincture; then add the other ingredients, and shake them all together.) A powerful stimulant, chiefly used in hysteria. Dose, min. v. to min. x., in water.

ANETHUM, L. E. *Dill. Fruit of Anethum graveolens.*—A native of the South of Europe, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—An annual, 1 to 2 feet high; stem striated; leaves decompound, with fine capillary segments; flowers yellow.

P. & C. P.—The fruit, commonly called *dill-seed*, is elliptical, flat, of a brownish colour, with a lighter-coloured, thin, membranous margin. The odour resembles caraway; the taste is pungent, somewhat bitter. It contains about 3 per cent. of a light yellow, volatile oil, on which its properties depend.

TH. E.—An aromatic stimulant, sometimes used in the flatulent colic of children, and in the form of dill-water as a vehicle for other remedies, chiefly purgatives, the griping properties of which it corrects.

D. & M. OF ADM.—Gr. x. to 3i. of the burised fruit for adults.—*Oleum Anethi*, E. (Prepared according to the general directions for the preparation of volatile oils.) Dose, min. j. to min. v., rubbed up with sugar.—*Aqua Anethi*, L. E. (Dill, bruised, ℔iss. (℥xviij., E.); rectified spirit, f℥vij. (f℥iij., E.); water, cong. ij.; let a gallon distil.) Dose, f℥ss. to f℥iij.

ANGELICA, E. ANGELICA ARCHANGELICA, SEMINA, D. *Fruit* (*Root*, E.) *of Angelica archangelica.*—Indigenous, but very rare; belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Biennial, 4 to 5 feet high; stem 1 to 2 inches thick, fistulose; leaves bipinnate; flowers greenish-white.

P. & C. P.—The root is imported from Hamburgh; it consists of numerous branches, of the thickness of the little finger, proceeding from a short spindle-shaped rootstalk, grayish-brown externally, whitish within. The odour is aromatic and agreeable; the taste warm, aromatic, and pungent. The fruit, commonly called *angelica seed*, is oval, obtuse, 1 to 2 lines long, of a yellowish-brown colour, flat, longitudinally striated on one side, convex on the other; it has the odour and taste of the root. The medicinal properties of both root and fruit depend on a volatile oil, which may be obtained by distillation. The root also contains bitter extractive, and a bitter resin.

TH. E.—An aromatic stimulant and carminative, not much used. Dose, of the *powdered root*, gr. x. to 3ss.; of the *bruised fruit*, 3ss. to 3i.

ANISUM, L. E. PIMPINELLA ANISUM, SEMINA, D. *Anise. Fruit of Pimpinella anisum.*—A native of Egypt and the Levant, exten-

sively cultivated in various parts of Europe; it belongs to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Annual, about a foot high; stem smooth, erect, branching; leaves of the stem decompound; flowers small, white, in terminal umbels.

P. & C. P.—The fruit, commonly called *aniseed*, is ovoid, composed of two mericarps, with five primary ridges, slightly hairy, of a yellowish-brown colour; it has a peculiar, sweet, aromatic odour, and a warm, sweetish taste. Its properties depend on the volatile oil, of which it contains 3 per cent.; this oil is transparent and nearly colourless, having a slight greenish-yellow tinge; it congeals at 50° F., and does not become fluid again under 62°. It has the odour and taste of the fruit.

Adulterations.—The oil of star-anise (*Illicium anisatum*), which resembles oil of anise in odour and appearance, is often sold for it; the fraud is one of little consequence, but may be readily detected, as star-anise oil retains its fluidity at 35° F. The fruit of the hemlock has been confounded with *aniseed*, and, in consequence, fatal accidents have occurred; they may be distinguished by the odour, and by the elevated ridges of anise fruit being smooth at the margin, not crenulate.

Th. E.—Anise is an aromatic stimulant and carminative, and as such is employed in flatulent colic, and in the diarrhœa of infants and children. It is said to promote the secretion of milk in nurses. It is much used on the Continent to flavour liqueurs.

D. & M. of Adm.—Of the bruised fruit, gr. x. to ʒss.—*Oleum Anisi*, D. L. E. (Prepared according to the general directions for distilling volatile oils.) This oil is generally imported from Germany and the East Indies. Dose, min. ij. to min. viij., rubbed up with sugar.—*Spiritus Anisi*, L. (Anise, bruised, ℥x.; proof spirit, cong. j.; water, Oij.; mix, and with a slow fire distil a gallon.)—*Spiritus Anisi comp.*, D. (Aniseeds, bruised, and angelica seeds, bruised, of each, ℔ss.; proof spirit, cong. i.; water, sufficient to prevent empyreuma; macerate for 24 hours, and distil a gallon.) The dose of either of those preparations is from fʒss. to fʒi.

Armoracia. — *Horse-radish* (described in the division *Sialogogues*) is sometimes used as a warm stimulant, chiefly as an adjunct to other medicines; it was formerly classed among the Antiscorbutics, but is little employed in the present day. The following are the officinal preparations: *Infusum Armoraciæ comp.*, D. L. (Horse-radish root (fresh, D.), sliced; mustard, bruised, of each, ℥i.; compound spirit of horse-radish, fʒi.; boiling water (distilled, L.), ℔i. (Oj., L.); macerate the root (and the seeds, L.) in the water for 6 (2, L.) hours in a vessel lightly covered, and strain; then add the compound spirit of horse-radish.) Dose, fʒi. to fʒij. —*Spiritus Armoraciæ comp.*, D. L. (Horse-rad sh root (fresh, D.), sliced, and dried orange peel, of each, ℔j. (℥xx., L.); nutmegs, bruised, ℥ss. (ʒv., L.); proof spirit, cong. j.; water, sufficient to prevent empyreuma (Oij., L.); mix (macerate for 24 hours, D.)

and distil a gallon.) Dose, f℥j. to f℥iv. Sliced horse-radish is a useful addition to the warm foot-bath, to render it more stimulant.

ARNICA MONTANA, FLORES, FOLIA, ET RADIX, D. *Leopard's bane. Flowers, leaves, and root of Arnica montana.*—A native of the Alps and of the Pyrennees, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua.*

B. C.—Perennial, about a foot high; stem hairy, simple, and single-flowered, or compound and many-flowered; leaves oval, entire; flowers golden-yellow.

P. & C. P.—The whole plant has a strong, peculiar odour, and an herbaceous, acrid, somewhat bitter taste. The flowers and leaves are collected in July, and the roots in September. The flowers only are at present met with in the Dublin shops; they consist of resin, a bitter, acrid principle (*cytisin*), yellow colouring matter, gum, and some salts. Weber has also obtained from them a small quantity of a blue volatile oil. They yield their active principles to water and to alcohol.

TH. E.—Arnica bears a high character on the Continent, particularly in Germany, as a stimulant in adynamic febrile affections, in chronic rheumatism, in paralysis, in amaurosis, &c., but it is scarcely ever used in Great Britain. I have seen a tincture of the flowers prove useful in nervous headache.

D. & M. OF ADM.—Of the powder of the root, gr. x., three or four times a day. The flowers are usually given in the form of infusion or tincture.—*Infusum Arnicæ*, AUST. (Arnica flowers, ℥ss.; boiling water, f℥xij.; infuse till cold, and strain.) Dose, f℥ij. to f℥ss.—*Tinctura Arnicæ*, POL. (Arnica flowers, ℥iss.; proof spirit, f℥xij.; digest for 7 days, express, and strain.) This tincture may be readily prepared by percolation, having previously macerated the flowers with a little of the spirit for 24 hours. Dose, f℥ss. to f℥ij.

BALSAMUM TOLUTANUM.—*Balsam of Tolu* (described in the division *Expectorants*) is an excellant stimulant in alopecia or baldness; it is best applied in the form of pommade, as follows: Prepared lard, ℥ij.; white wax, ℥iij.; melt together; remove from the fire, and when they are beginning to thicken, add, with constant stirring, balsam of Tolu, f℥ij.; and oil of bergamot, min. xx.

CAJUPUTI, L. E. MELALEUCA LEUCADENDRON, OLEUM VOLATILE, D. *Oil of Cajeput. Volatile oil of the leaves of Melaleuca minor*, L. E.—*of Melaleuca leucadendron*, D.—The tree, to which this oil is correctly referred by the London and Edinburgh Colleges, is a native of the Molucca Islands; it belongs to the natural family *Myrtaceæ*, and to the Linnæan class and order *Polyadelphia Icosandria.*

B. C.—Trunk about 20 feet high, crooked, with scattered branches; leaves smooth, deep green, 3 to 5 inches long; flowers white, in short terminal spikes.

P. U. & M. OF PREP.—The volatile oil is procured from the leaves by distillation; the leaves are gathered in the end of September, macerated for 24 hours with water, and then put into a copper still with sufficient water. The oil comes over with the water into the receiver, and floats on the surface.

P. & C. P.—Cajeput oil is limpid, very mobile, transparent, and of a fine green colour. It has a strong, agreeable odour, resembling a mixture of camphor, roses, and peppermint; the taste is warm and aromatic, leaving a sensation of coldness in the mouth. Its sp. gr. is about ·925. It boils at 343°, and may be obtained nearly colourless by redistillation. The composition of this oil is $C^{10}H^{9}O$; it is soluble in alcohol.

Adulterations.—In consequence of its high price, and the great demand for it while the cholera raged in the British Isles, cajeput oil was often counterfeited with oil of rosemary, coloured and flavoured with camphor and cardamom seeds. The fraud was one difficult of detection, but at present it is met with in a very pure state. As imported, it sometimes contains copper, which may be recognised by its affording a reddish precipitate when agitated with a solution of ferrocyanide of potassium.

Th. E.—Cajeput oil is a powerful diffusible stimulant, at present not much used. When the Asiatic cholera first appeared, it was highly extolled as a remedy for that disease, but it did not retain its reputation long. It is much employed on the Continent in chronic rheumatism, gout, hysteria, and other nervous affections. Dose, min. v. to min x., rubbed up with sugar.

Calamus aromaticus, E. Acorus, L. *Sweet Flag. Rhizome of Acorus calamus.*—Indigenous, belonging to the natural family *Acoraceæ*, and to the Linnæan class and order *Hexandria Monogynia.*

B. C.—Rhizome creeping, with many long roots; leaves, 2 to 3 feet high, bright green; flowers pale green, arranged upon a spadix.

P. & C. P.—The rhizome or rootstalk, in the dried state, as met with in the shops, is in flattened pieces from 3 to 5 inches long and half an inch broad, with a corrugated, yellowish-brown, scaly cuticle; internally it is spongy, with a pinkish-yellow hue. It has an aromatic odour, and a pungent, bitter taste. Sweet flagroot is composed of soft resin, extractive, gum, inulin, a trace of volatile oil, some salts, and woody fibre. It yields its properties to alcohol and to water.

Th. E.—An aromatic stimulant, scarcely ever employed. It may be used as an adjunct to tonics in debility of the digestive organs. Dose, in powder, gr. xx. to ʒi.; in infusion (prepared by digesting ʒi. of the bruised rhizome in fʒxij. of boiling water for an hour), fʒi. to fʒij.

Calx chlorinata, L. E. *Chloride of lime. Chlorinated lime. Hypochlorite of lime. Bleaching Powder.*

P. P.—As commonly met with, this is a white or yellowish-white powder, with a faint odour of chlorine, and an acrid, disagreeable, persistent taste.

C. P.—Hypochlorite of lime is a mixture of 1 eq. of chloride of calcium, 1 of tribasic hypochlorite of lime, and 4 of water. Exposed to the air, it deliquesces, evolves chlorine, and attracting

carbonic acid, is converted into carbonate of lime and chloride of calcium. It is partially soluble in water, a little hydrate of lime being left undissolved; the solution has a strong alkaline reaction, and bleaches vegetable colours, especially if an acid be added, which evolves the chlorine. Its best characteristics are its peculiar odour in solution, and the white precipitates it affords with solutions of nitrate of silver, of carbonates, and of oxalates.

Prep.—It is an article of the Materia Medica in the *Edin. Phar.*, and is usually prepared on the large scale, for commercial purposes, by exposing hydrate of lime, from the purest lime, to chlorine gas, the latter being supplied so gradually as to prevent the heat occasioned by the combination from rising above 62°. The following process is given in the *Lond. Ph.* for its preparation: "Take of hydrate of lime, ℔j.; chlorine, a sufficiency; pass chlorine to the lime, spread in a proper vessel, until it is saturated. Chlorine is very readily evolved from hydrochloric acid added to binoxyde of manganese, with a gentle heat."

Adulterations.—This compound frequently contains a very small quantity of chlorine, either from being originally badly prepared or from careless preservation; various processes have been described for *chlorometry;* but for medical purposes, the tests for the purity of the powder as given in the *Edin. Phar.* are amply sufficient: "Pale grayish-white; dry; gr. l. are nearly all soluble in f℥ij. of water, forming a solution of the density 1027; and of which 100 measures, treated with an excess of oxalic acid, give off much chlorine, and if then boiled and allowed to rest 24 hours, yield a precipitate which occupies 19 measures of the liquid."

Th. E.—Hypochlorite of lime acts as a powerful stimulant, whether taken internally or applied locally; it also possesses in a remarkable degree the property of destroying fetid effluvia, particularly when arising from the decay of animal matter, and of arresting or preventing the putrefactive process. In medicine, it has been chiefly administered as an internal remedy in the advanced stages of typhoid fever and in epidemic dysentery, being found particularly useful when the evacuations are very offensive. As a topical agent, it is employed with benefit in the form of lotion to foul or gangrenous ulcers with excessive discharge, and extensive burns or scalds, in purulent ophthalmia, in chronic cutaneous diseases, particularly scabies, which it seldom fails to cure speedily and effectually, and as an injection in diseases of the rectum, the uterus, or vagina, when accompanied with fetid discharges. In excessive mercurial salivation, a gargle of one part of hypochlorite of lime dissolved in 100 parts of water will be found very effectual both in correcting the fœtor and checking the excessive secretion. This substance has been also employed as a disinfectant, to prevent the spreading of epidemic diseases, and to destroy infection or contagion, but much doubts have been recently thrown on its disinfecting properties.

D. & M. of Adm.—Internally, gr. ij. to gr. v., dissolved in water and sweetened with sugar, or in some aromatic distilled water. For external use, solutions of various strengths are employed; in purulent ophthalmia, 3ss. to 3ij. in f℥i. of water; for cutaneous diseases, ℥iij. to Oj. of water; for a lotion or injection, gr. xx. to gr.

xxx., in fʒi. of water. Solutions of this substance should be always filtered, to remove the insoluble hydrate of lime. When it is desired to disengage the chlorine rapidly from hypochlorite of lime, any weak acid may be added to the solution.

Incomp.—Sulphuric acid and its salts; the alkalies; and all soluble carbonates and oxalates.

Camphora, D. L. E. *Camphor. Camphor of Laurus Camphora, and of Dryobalanops Camphora*, D. *A peculiar concretion purified by sublimation, from Laurus Camphora.* L. *Camphor of Camphora officinarum*, E.—The Edinburgh College have adopted the botanical nomenclature of Nees von Esenbeck with reference to the camphor-tree; it is a native of China and Japan, and belongs to the natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia*. The camphor obtained from the Dryobalanops camphora is not brought to Europe.

B. C.—A handsome tree, with a straight trunk, branching at the top; leaves oval, pointed, shining, evergreen, emitting a strong odour of camphor when bruised; flowers small, whitish, in axillary and terminal panicles; fruit, a small rounded, fleshy drupe, with an acrid, aromatic taste.

P. U. & M. of Prep.—Camphor is procured from the small branches, the leaves, the wood, and the root of the tree, which are cut into small pieces, and boiled with water in an iron cucurbit, to which an earthen capital is luted; the camphor sublimes, and is condensed on straws placed in the capital. In this coarse state it is imported into Europe, when it is purified by being sublimed in glass vessels, quicklime having previously been mixed with the crude camphor to retain the impurities.

P. P.—Refined camphor is met with in hemispherical masses, perforated in the centre; it is white, translucent, shining, fragile, with a crystalline fracture; nevertheless, tough, and pulverized with great difficulty, unless with the aid of a little rectified spirit. It is lighter than water, its density being 0·9857. It has a peculiar aromatic smell, and a bitter, cooling taste.

C. P.—Camphor is a species of solid volatile oil; it is composed of 1 eq. of camphogen ($C^{20}H^{14}$) and 2 of water (Dumas). It evaporates at the ordinary temperature of the air; in close vessels it fuses at 347°, and boils at 399°, condensing unchanged. It requires 1000 parts of water for its solution, to which, however, it imparts both odour and taste; but it may be suspended in large quantity in water by means of mucilage, sugar, yolk of egg, &c. It is very soluble in alcohol, ether, and the fixed and volatile oils. The solution in alcohol is precipitated by water. Milk dissolves an eighth of its weight of camphor, which it retains on the addition of water.

Th. E.—Much difference of opinion exists as to the action of camphor on the animal economy, but the most constant and most marked effect which it produces is that of a general diffusible stimulant; and this is borne out by the symptoms which are caused by it when taken in an over-dose. In the practice of medicine it has been used in a great variety of diseases, in consequence of the discrepancy which even still exists as to its effects; but the following are the principal maladies in which it proves decidedly beneficial. In the advanced stages of typhoid fever, when nervous symptoms,

as subsultus, tendinum, delirium, &c., chiefly predominate. In chronic bronchitis occurring in broken-down habits, particularly when accompanied with profuse secretion; in spasmodic and nervous diseases, provided there is no inflammatory tendency in the system; in atonic gout and chronic rheumatism; and in irritable and painful diseases of the urinary organs. As an external application, camphor is very generally employed, dissolved in spirit or in oil, as an embrocation for muscular and rheumatic pains, for bruises, to glandular enlargements, and to chilblains. It is also used with much benefit as a stimulant to foul and indolent ulcers, and to gangrenous sores occurring in the old or debilitated. Camphor has been occasionally used in the form of vapour as a fumigation in chronic cutaneous diseases, and to promote diaphoresis when the skin is dry and harsh.

D. & M. OF ADM.—Gr. v. to gr. x., repeated at short intervals; it is usually given in the form of pill, or made into an emulsion with water by means of mucilage, sugar, yolk of egg, &c.; ʒij. of camphor may be permanently suspended in fʒviij. of water by means of ʒi. of thick mucilage, or it may be dissolved in new milk, as observed above.—*Mistura Camphoræ*, D. L. E. ("Camphor, ℈i.; rectified spirit, gtt. x.; pure sugar, ʒss.; warm water, *by measure*, ℔j.; first rub the camphor with the spirit, then with the sugar, afterward add the water with trituration, and filter the mixture through bibulous paper," D. "Camphor, ʒss.; rectified spirit, min. x.; water, Oi.; first rub the camphor with the spirit, then with the water gradually poured in, and strain through linen," L. "Camphor, ℈j.; sweet almonds and pure sugar, of each, ʒss.; water, Oj.; steep the almonds in hot water, and peel them; rub the camphor and the sugar well together in a mortar; add the almonds; beat the whole into a smooth pulp; add the water gradually, with constant stirring, and strain," E.) This preparation contains so small a quantity of camphor, that it is only used as a vehicle for more active stimulants. Dose, fʒi. to fʒij.—*Mistura Camphoræ cum Magnesiâ*, D. E. ("Camphor, gr. xij. (gr. x., E.); carbonate of magnesia, ʒss. (gr. xxv., E.); water, fʒvj.; rub the camphor with the magnesia, adding the water gradually, and mix.) The carbonate of magnesia enables the water to dissolve more of the camphor, and also gives to the mixture slight antacid properties. Dose, fʒss. to fʒi.—*Tinctura Camphoræ*, D. L. E. (Camphor, ʒi. (ʒv., L.; ʒiiss., E.); rectified spirit, fʒviij. (Oij., L. E.); mix, that the camphor may be dissolved.) *Camphorated spirit*; for external use only; an excellent application for muscular and rheumatic pains applied with friction. The camphor is precipitated by the addition of water.—*Oleum Camphoratum*, D. *Linimentum Camphoræ*, L. E. (Camphor, ʒj. (ʒi., L. E.); olive oil, ʒj. (fʒiv., L. E.); dissolve the camphor in the oil by trituration.) A stimulating embrocation for deep-seated inflammation, glandular swellings, &c.—*Linimentum Saponis*, D. L. E. ("Soap, ʒiij.; camphor, ʒj.; spirit of rosemary, fʒxvj.; digest the soap in the spirit till it is dissolved, then add the camphor, D. (Dissolve the

camphor in the spirit; afterward add the soap, and macerate with a gentle heat till it is dissolved, L)," D. L. "Castile soap, ʒv.; camphor, ʒiiss.; oil of rosemary, fʒvj.; rectified spirit, Oij.; digest the soap in the spirit for 3 days; add the camphor and oil, and agitate briskly," E.) *Soap Liniment; Opodeldoc.* A useful stimulating liniment.

[U. S. P.—*Aqua Camphoræ.* Camphor, 2 drachms; alcohol, 40 minims; carbonate of magnesia, 1 drachm; distilled water, 2 pints. Rub the camphor first with the alcohol, afterward with the carbonate of magnesia, and, lastly, with the water gradually added, and filter through paper.]

Incomp.—The following observations of M. Planche should be borne in mind in prescribing camphor: with benzoïn, balsam of Tolu, ammoniac, and mastich, it forms a soft mass, which does not retain the pilular form; camphor is completely deprived of odour by being mixed with assafœtida, galbanum, sagapenum, and balsam of Tolu, and the odour is very much weakened by olibanum, mastich, ammoniac, opoponax, benzoïn, and resin of guaiacum.

Capsicum.—*Cayenne Pepper* (described in the division *Epispastics*) is not much employed in medicine internally; it is a good stimulant in those forms of dyspepsia which depend on enfeebled and languid digestion, and in the collapse of cholera and of typhus. As a topical remedy, it is used with much benefit as an adjunct to stimulating gargles in cynanche maligna, and in all forms of relaxed sore throat. For this purpose, the tincture, or *Chili vinegar*, is generally employed. The dose of powdered capsicum is from gr. ij. to gr. viij., made into pill with crumb of bread.—*Tinctura Capsici*, D. L. E. (Capsicum (bruised, L. E.), ʒi. (ʒx., L. E.); proof spirit, ℔ij. (Oij., L. E.); macerate (digest, E.) for 14 (7, E.) days, and filter, "squeezing the residuum. This tincture is best prepared by percolation, which may be commenced so soon as the capsicum is made into a pulp with a little spirit," E.) Dose, *internally*, min. xx. to fʒi.; as an adjunct to gargles, fʒiv. to fʒvj., in fʒviij. of an aqueous vehicle.—*Chili Vinegar* (prepared by infusing ʒss. of Cayenne pepper in Oij. of white wine vinegar for 10 days, and straining) is added to gargles, in the proportion of fʒi. in fʒviij. of infusion of roses.—*Cayenne Lozenges*, allowed to dissolve slowly in the mouth, are very useful in the hoarseness and relaxed sore throat of public speakers and singers.

Cardamine, L. Cardamine pratensis, flores, D. *Cuckoo flower. The flowers of Cardamine Pratensis.*—Indigenous, belonging to the natural family *Cruciferæ*, and to the Linnæan class and order *Tetradynamia Siliquosa.*

The flowers of this plant are blush-coloured; they have a slight aromatic odour, and a pungent, bitter taste. Their virtues depend on a trace of volatile oil, and some bitter extractive which they contain; though at one time highly spoken of as stimulants in epilepsy and in spasmodic asthma, they have completely fallen into

disuse. The dose of the dried flowers was from ʒij. to ʒiij. several times a day.

Cardamomum, L. E. Amomum cardamomum, semina, D. *Cardamoms. The seeds of Amomum Cardamomum*, D. *Seeds of Alpinia Cardamomum*, L. *Fruit of Renealmia Cardamomum*, E. *Fruit of Elettaria Cardamomum*, Maton.—The various sorts of cardamoms met with in commerce are obtained from the plants above enumerated, or from nearly allied species; but the true officinal or *lesser* cardamom is the product of that last named. It is a native of Malabar, and belongs to the natural family *Zingiberaceæ*, and to the Linnæan class and order *Monandria Monogynia*.

B. C.—Stem erect, 6 to 9 feet high, perennial; leaves 1 to 2 feet long, enveloping the stem with their spongy sheaths; scapes several, arising from the base of the stem, 1 to 2 feet long; flowers alternate, on suberect racemes, 2 to 3 inches long, greenish-white, with violet stripes; capsule oval, 3-celled.

P. P.—Cardamoms are the dried fruit; they are gathered in November; as met with in commerce, each fruit is ovato-oblong, obscurely triangular, from three lines to an inch in length, of a pale brownish-yellow colour, coriaceous. They contain numerous angular, reddish-brown seeds. They have an agreeable aromatic odour, and a grateful, pungent taste.

C. P.—Cardamoms are composed of volatile oil, fixed oil, fecula, colouring matter, mucilage, and nitrogenous matter; they yield their active principles to water and to alcohol. A cooled decoction is rendered blue by tincture of iodine.

Th. E.—Cardamoms are among the most agreeable of the aromatic stimulants, and are commonly employed as adjuvants to more active medicines of this class, or to correct the griping properties of some purgatives.

D. & M. of Adm.—In powder, gr. v. to gr. xx.—*Tinctura Cardamomi*, L. E. (Cardamom seeds, bruised, ʒiiiss. (ʒivss., E.); proof spirit, Oij.; "macerate for 14 days, and strain," L. "Digest for 7 days, strain, squeeze the residuum, and filter the liquors. This tincture may be better prepared by the process of percolation, in the same way with the tincture of capsicum, the seeds being first ground in a coffee-mill," E.) An aromatic adjunct to mixtures, in doses of fʒi. or fʒij.—*Tinctura Cardamomi comp.*, D. L. E. ("Cardamom seeds, without the capsules, and bruised; and caraway seeds, bruised, of each, ʒij.; cinnamon, bruised, ʒss.; proof spirit, *by measure*, ℔ij.; macerate for 14 days, and filter," D. "Cardamom seeds, bruised, and caraway, bruised, of each, ʒiiss.; cochineal, powdered (bruised, E.), ʒj.; cinnamon, bruised, ʒv.; raisins, ʒv.; proof spirit, Oij.; macerate for 14 days, and strain," L. "Digest for 7 days, strain, express strongly the residuum, and filter the liquors. This tincture may be also prepared by the method of percolation, if the solid materials be first beat together, moistened with a little spirit, and left thus for 12 hours before being put into the percolator," E.) Dose, fʒj. to fʒij.

Carui, L. E. Carum carui, semina, D. *Caraway. The fruit*

(*seeds*, D.) *of Carum Carui.*—Indigenous, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Biennial; stem 1 to 2 feet; leaves doubly pinnated, cut into linear segments; flowers white, or pale flesh-coloured, in dense umbels.

P. & C. P.—The fruit, commonly called caraway seeds, does not require description; it has an agreeable, fragrant odour, and a warm, aromatic taste. It contains about 5½ per cent. of a light yellow volatile oil, upon which its aromatic properties depend.

Th. E.—Caraway is an agreeable, aromatic stimulant, much employed by the cook and confectioner as a seasoning and flavouring agent. In medicine, it is used for giving warmth to other preparations.

D. & M. of Adm.—Of the seeds, ʒi. to ʒij.—*Oleum Carui*, D. L. E. (Prepared according to the general directions for distilling volatile oils.) Frequently added to cathartic pills and boluses. Dose, min. j. to min. x. This oil is often adulterated with oil of turpentine, which may be detected by the odour when dropped on a heated spatula.—*Aqua Carui*, D. L. ("Caraway, bruised, ℔j.; water, sufficient to prevent empyreuma; distil a gallon," D. "Caraway, bruised, ℔iss.; proof spirit, fʒvij.; water, cong. ij.; distil a gallon," L.) Used as an aromatic vehicle for other medicines, and in the flatulent colic of children. Dose, fʒi. to fʒiv.—*Spiritus Carui*, D. L. E. ("Caraway, bruised, ℔j.; proof spirit, cong. j.; water, sufficient to prevent empyreuma; macerate for 24 hours, and distil a gallon," D. "Caraway, bruised, ʒxxij.; proof spirit, cong. j.; water, Oij.; mix, and with a slow fire distil a gallon," L. "Caraway, bruised, ℔ss.; proof spirit, Ovij.; macerate for two days in a covered vessel, add Oiss. of water, and distil off Ovij.," E.) Aromatic and stimulant. Dose, fʒi. to fʒiv.

Caryophyllus; Caryophylli oleum, L. E. Eugenia caryophyllata, flores nondum expliciti et oleum volatile, D. *Cloves, and their volatile oil. Dried undeveloped flower* (*dried buds*, L.), *and the volatile oil distilled from them* (*distilled from the flowers*, L.), *of Caryophyllus aromaticus*, L. E.—*of Eugenia Caryophyllata*, D.—The same tree is indicated by all the colleges, but the Dublin has adopted the nomenclature of Thunberg. It is a native of the Molucca Islands, and grows freely in various parts of the East and West Indies. It belongs to the natural family *Myrtaceæ*, and to the Linnæan class and order *Polyandria Monogynia.*

B. C.—Stem 15 to 30 feet high; leaves opposite, coriaceous, dotted, obovato oblong; flowers whitish, numerous, in terminal or axillary cymes.

P. & C. P.—Cloves are the undeveloped flowers, consisting of the tubular calyx with the unexpanded corolla, forming a small round ball between its four teeth. Their odour is peculiar, agreeably aromatic, and their taste pungent, somewhat acrid. They consist of 18 per cent. of volatile oil, 6 of an almost tasteless resin (*Caryophyllin*), 13 of tannin, 4 of extractive, 13 of gum, 28 of lignin, and 18 of moisture (Tromsdorff). The volatile oil is an article of the

Materia Medica in the British Pharmacopœias. As obtained by distillation, it consists of two volatile oils, one heavier, the other lighter than water, a mixture of the two forming oil of cloves of commerce. It is at first pale yellow, but gradually acquires a reddish tint; it has the odour and taste of cloves in a marked degree; it is very soluble in alcohol, ether, strong acetic acid, and the fixed oils; and but very sparingly soluble in water, in which it sinks, its density being about 1·060. Cloves yield their properties to water and to alcohol.

Adulterations.—Cloves from which the oil has been procured by distillation are sometimes mixed with good cloves; they may be distinguished by their lightness, and by their not becoming greasy when bruised with the nail.

Th. E.—Cloves and their oil are aromatic stimulants, and are employed in medicine as flavouring or corrective adjuncts to other substances; they are extensively used by the cook and confectioner. The oil dropped into the hollow of a carious tooth will often relieve toothache.

D. & M. of Adm.—In substance, gr. x. to ʒss.—*Oleum Caryophylli*, min. ij. to min. viij.—*Infusum Caryophyllorum*, D. *Inf. Caryophylli*, L. E. (Cloves, bruised, ʒi. (ʒiij., L. E.); boiling water (distilled, L.), *by measure*, ℔ss. (Oj., L. E.); digest (macerate, L.; infuse, E.) for two hours in a covered vessel, and strain.) An aromatic vehicle for more active medicines. Dose, fʒi. to fʒij.

Incomp.—*With the infusion.* The mineral acids; sesqui-salts of iron; sulphate of copper; nitrate of silver; acetate of lead; and gelatine.

Cassiæ cortex et oleum, E. Laurus cassia, cortex, D. *Cassia bark. Oil of Cassia. Bark* (*and volatile oil of the bark*, E.) *of Cinnamomum Cassia*, E.—*of Laurus Cassia*, D.—The bark met with in English commerce is procured from the tree indicated by the Edinburgh College. It is a native of China, and is cultivated in Java; it belongs to the natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia*.

B. C.—Stem arborescent, about 50 feet high; leaves oblongo-lanceolate, triple-nerved, the nerves vanishing at the point of the leaf; petioles and younger branches silky-tomentose; flowers white, in panicles.

P. P.—No account has been given of how cassia is prepared, but it is more than probable that it is by a similar process with cinnamon. It is imported from Singapore in bundles tied with slips of the bamboo cane; it resembles cinnamon in appearance, and is often sold for it, but it is darker coloured, much thicker, and in simple quills. The odour is not so fragrant as that of cinnamon, and the taste is more pungent, and somewhat bitter.

C. P.—Cassia bark consists of 0·8 per cent. of volatile oil, 4 of resin, 14·6 of extractive, with woody fibre, &c.; the volatile oil is always imported; it is of a wine-yellow colour, and has the odour and flavour of the bark; it is heavier than water, its density being 1·095. Cassia bark yields its active properties to alcohol, but only

partially to water. The undeveloped flowers of *Cinnamomum Cassia* are imported under the name of Cassia buds (*Clavelli Cinnamomi*). They have the same properties as the bark, but are not employed in medicine.

Th. E.—Cassia and its preparations are precisely analogous in their operation to cinnamon, for which, as being much cheaper, they are usually substituted; they are not, perhaps, quite so agreeable, and some have held them to be more astringent.

D. & M. of Adm.—Of the bark, powdered, gr. x. to ʒss.—*Oleum Cassiæ*, E., min. ij. to min. v.—*Aqua Cassiæ*, E. (Cassia bark, bruised, ʒxviij.; water, cong. ij.; rectified spirit, fʒiij.; mix together, and distil off one gallon.) An aromatic vehicle for more active medicines. Dose, fʒi. to fʒiv.—*Spiritus Cassiæ*, E. (Cassia bark, in coarse powder, ℔j.; proceed as for spirit of caraway.) Dose, fʒss. to fʒi.—*Tinctura Cassiæ*, E. (Cassia bark, in moderately fine powder, ʒiij. and ʒiij.; proof spirit, Oij.; digest for 7 days, strain, express the residuum strongly, and filter. This tincture is more conveniently made by percolation, the cassia being allowed to macerate for 12 hours in a little of the spirit before being put into the percolator.) Dose, fʒi. to fʒij.

Incomp.—The sesqui-salts of iron, and gelatine.

Cepa. Allium cepa, bulbus, D. *The Onion. Bulb of Allium Cepa.*—A native of Egypt, belonging to the natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia.*

Roasted onions were at one time employed in the form of poultice to stimulate indolent tumours, and to foul ulcers; but they are not used in medicine in the present day.

Cerevisiæ fermentum, D. L. *Yeast. Barm. A vegetable product developed in vinous liquids during the process of fermentation.*—Yeast is employed as a stimulant in the advanced stages of typhoid fevers, and in the form of enema in tympanitis, and has been highly spoken of in cases where wine is inadmissible in consequence of inflammatory symptoms. Its principal use at present is for the preparation of a stimulating cataplasm for foul and irritable sores, the fœtor of which it corrects, and, at the same time, promotes the separation of the sloughs.—*Cataplasma Fermenti*, D. L. (Yeast, ℔ss. (Oss., L.); wheaten flour, ℔j.; mix, and apply a gentle heat until they begin to rise.) This cataplasm should be renewed every six or eight hours; if it occasion much pain, the quantity of flour ought to be increased. The dose of yeast for internal use is two tablespoonfuls every three hours; it may be given with camphor mixture or with peppermint water.

Chlorinii aqua, D. Chlorinei aqua, E. *Chlorine water. Concentrated watery solution of Chlorine (with a little sulphate of soda*, E.).

Prep.—*Dub.* "Dried muriate of soda, 100 parts; oxyde of manganese, 30 parts; sulphuric acid, 87 parts; water, 124 parts; add the acid gradually to the water; and

when the mixture has grown cold, pour it on the muriate of soda and oxyde of manganese, both previously reduced to fine powder, well mixed, and put into a retort; then, with a proper apparatus, and a moderate heat gradually increased, transmit the gas escaping from the mixture through 200 parts of distilled water, the operation being finished as soon as the effervescence in the retort has ceased. Let the chlorine water be kept in well-stopped bottles, in a dark place." *Edin.* "Muriate of soda, gr. lx.; sulphuric acid (commercial), f℥ij.; red oxyde of lead, 350 grains; water, f℥viij.; triturate the muriate of soda and oxyde together; put them into the water contained in a bottle with a glass stopper; add the acid, agitate occasionally, till the red oxyde becomes almost white. Allow the insoluble matter to subside before using the liquid."

P. & C. P.—Prepared according to the directions of the Dublin Pharmacopœia, this is a yellowish-green liquid, with the suffocating odour of chlorine, and an acrid, styptic taste; its density is 1·013. It contains about twice its bulk of chlorine gas; it bleaches all vegetable colours. By long keeping, particularly if exposed to light, it is converted into a weak solution of muriatic acid, and oxygen is evolved. In consequence of these disadvantages, the Edinburgh Pharmacopœia contains a formula, given above, by which an aqueous solution of chlorine may be obtained in a few hours. It contains a small quantity of sulphate of soda dissolved in it, which, however, can in nowise interfere with its medicinal employment; and a white sulphate of lead remains as an insoluble precipitate in the bottom of the bottle. Chlorine water is characterized by its bleaching properties, by its power of dissolving leaf gold, and by its not effervescing with carbonate of lime.

Th. E.—Taken in large quantity, chlorine water acts as a powerful irritant poison. In medicinal doses, it operates as a stimulant, and as such is employed with benefit in the advanced stages of typhoid fevers and of epidemic dysentery, in malignant sore throat, and in chronic diseases of the liver. Chlorine gas diluted with common air has been inhaled in chronic bronchitis and in phthisis, but, although the symptoms are often ameliorated under its employment, the benefit produced is not permanent. Externally, chlorine water has been used largely diluted as a wash to foul and indolent ulcers, and for chronic cutaneous diseases, in the form of gargle in cynanche maligna, and as a local bath in hepatitis.

D. & M. of Adm.—f℥ss. to f℥ij. in as many ounces of water sweetened with sirup. For external use, f℥i. may be diluted with f℥j. of water.

Incomp.—Nitrate of silver.

In poisoning with chlorine water, the best antidote is albumen, as white of egg, or, in its absence, milk or flour.

Cinnamomum, L. E. Cinnamomi oleum, L. E. Laurus cinnamomum, cortex et oleum volatile, D. *Cinnamon. Oil of cinnamon. Bark, and volatile oil of Laurus cinnamomum*, D. L.—*of Cinnamomum Zeylanicum*, E.—The cinnamon-tree is a native of Ceylon and Malabar; it belongs to the natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia*.

B. C.—Stem arborescent, about 30 feet high; branches obscurely 4-cornered; leaves tapering into a blunt point, 3-nerved, smooth, and perfectly free from down, as also are the leaf stalks; flowers in terminal and axillary stalked panicles.

P. U. & M. of Prep.—The inner bark of the branches, and the volatile oil obtained from it. The bark is taken from branches which are three years old; they are lopped off the trees in the rainy season, and the bark immediately removed by making two opposite longitudinal incisions; the epidermis and green pulpy matter are afterward scraped off, the smaller pieces introduced into the larger ones, and dried in the sun, the pieces contracting, as they dry, into the form of quills. The oil is obtained by macerating the coarser pieces of bark and the trimmings in sea-water for 48 hours, and distilling.

P. P.—Cinnamon is imported from Ceylon in bales and in boxes; some, also, is brought from Malabar. Three sorts are usually distinguished in commerce: the finest is in splintery rolls, consisting of compound quills, the smaller being enclosed within the larger, from 30 to 40 inches in length; the pieces are very thin, generally not much thicker than writing paper, of a light brownish-yellow colour, smooth on the surface, with a splintery fracture. The odour is aromatic and fragrant, and the taste warm, sweetish, and feebly astringent. The inferior kinds are in coarser quills, not so much rolled, of a darker-brown colour, and with a less agreeable odour and taste. Oil of cinnamon is imported from Ceylon; it is of a pale wine-yellow colour, becoming darker by age, and possesses intensely the peculiar odour and taste of the bark; it is heavier than water, its density varying from 1·038 to 1·041 (Christison).

C. P.—Cinnamon bark consists of volatile oil, tannin, mucilaginous extractive, an acid, resin, colouring matter, and woody fibre. It yields its properties partially to water, but more completely to alcohol. The volatile oil constitutes about 6 parts in a thousand of the fresh bark; it consists of a light and heavy oil, which may be obtained separate by distillation. The composition of oil of cinnamon is $C^{20}H^{11}O^2$ (Mulder); by exposure to the air, it absorbs oxygen, and is converted into a mixture of *cinnamic acid*, two peculiar resins, and water. Strong nitric acid converts oil of cinnamon into a solid crystalline mass.

Adulterations.—Cinnamon bark may be distinguished by its physical properties from cassia bark, which is often sold for it. The oil may be distinguished from oil of cassia by its more fragrant odour, and by the taste of the latter being more acrid and burning. The tests of the Edinburgh Pharmacopœia for the purity of oil of cinnamon apply equally to oil of cassia: "Cherry-red when old; wine-yellow when recent; odour purely cinnamomic; nitric acid converts it nearly into a uniform crystalline mass."

Th. E.—Cinnamon is an excellent warm stimulant, and, in consequence of its agreeable flavour, is very much employed in medicine, principally as an aromatic adjunct to other substances.

D. & M. of Adm.—In powder, gr. x. to ʒss.—*Oleum Cinnamomi*, D. L. E., min. j. to min. v.—*Aqua Cinnamomi*, D. L. E. ("Cinnamon, bruised, ℔j.; water, sufficient to prevent empyreuma; macerate for a day, and distil a gallon," D. "Cinnamon, bruised, ℔iss. (or oil of cinnamon, ʒij.); proof spirit, fℨvij.; water, cong. ij.; distil a gallon," L. "Cinnamon, bruised, fℨxviij.; water, cong. ij.; rectified spirit, fℨiij.; mix, and distil off one gallon," E.) [U. S. P. —Oil of cinnamon, ½ a fluid drachm; carbonate of magnesia, ½ a

drachm; distilled water, 2 pints. Rub the oil of cinnamon first with the carbonate of magnesia, then with the water gradually added, and filter through paper. In the same manner various other oils may be suspended in water.] An agreeable vehicle for other medicines. Dose, f℥i. to f℥iv.—*Spiritus Cinnamomi*, D. L. E. (Prepared as spirit of caraway, D. E. "Oil of cinnamon, ʒij.; proof spirit, cong. j.; water, Oi.; mix, and with a slow fire distil a gallon," L.) Dose, f3i. to f℥ss.—*Tinctura Cinnamomi*, D. L. E. ("Cinnamon, bruised, ℥iiiss.; proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 14 days, and strain," D. L. "Cinnamon, in moderately fine powder, ℥iiiss.; proof spirit, Oij.; proceed by percolation or digestion, as directed for tincture of cassia," E.) Dose, f3i. to f℥ss.—*Tinctura Cinnamomi comp.*, L. E. ("Cinnamon, bruised, ℥i.; cardamom, bruised, ℥ss.; long pepper, powdered, and ginger, sliced, of each, ʒiiss.; proof spirit, Oij.; macerate for 14 days, and strain," L. "Cinnamon, in coarse powder (fine, if percolation be followed), and cardamom seeds, bruised, of each, ℥i.; long pepper, ground finely, ʒiij.; proof spirit, Oij. This tincture is best prepared by percolation, as directed for the compound tincture of cardamom; but it may also be made by digestion for 7 days, straining and expressing the liquor, and then filtering it," E.) Dose, f3i. to f3ij.—*Confectio Aromatica*, D. L. (Cinnamon and nutmegs, of each, ℥ij.; cloves, ʒi.; cardamom seeds, ℥ss.; saffron, ℥ij.; prepared chalk, ℥xvj.; pure sugar, ℔ij.; "rub the dry ingredients together to a very fine powder, add ℔i. of water by degrees, and beat into a pulp," D. "Keep in a close vessel, and whenever the confection is to be used, add water gradually, and mix until they are thoroughly incorporated," L.) Stimulant, carminative, and antacid, frequently used in mild cases of diarrhœa. Dose, gr. xx. to ʒj.; substances incompatible with chalk should not be prescribed in combination with it.—*Pulvis Aromaticus*, D. E. *Pulv. Cinnamomi comp.*, L. ("Cinnamon, ℥ij.; cardamom seeds, ℥i. (℥iss., L.); ginger, ℥i.; long pepper, ʒi. (℥ss., L.); rub together to a very fine powder," D. L. "Cinnamon, cardamom seeds, and ginger, of each, equal parts; reduce to a very fine powder, and keep in well-closed glass vessels," E.) Dose, gr. v. to gr. xx.—*Electuarium Aromaticum*, E. (Aromatic powder, one part; sirup of orange peel, two parts; mix, and triturate into a uniform pulp.) Dose, gr. x. to gr. xl. —*Emplastrum Aromaticum*, D. (Frankincense, ℥iij.; yellow wax, ℥ss.; cinnamon, powdered, ʒvj.; oil of pimento and oil of lemons, of each, ʒij.; melt the frankincense and wax together, and strain; and when they are beginning to thicken by cooling, mix in the cinnamon powder, rubbed up with the oils, and make a plaster.) A stimulating plaster, applied over the region of the stomach in nausea and flatulence; not much used at present.

Incomp.—The sesqui-salts of iron, and gelatine.

Cocculus, E. Cocculus suberosus, fructus, D. *Cocculus Indicus. Fruit of Anamirta Cocculus*, E.—*of Cocculus Suberosus*, D.—A native of Malabar and the eastern islands of India, belong-

ing to the natural family *Menispermaceæ*, and to the Linnæan class and order *Diœcia Monadelphia.*

B. C.—A strong, climbing shrub; bark corky, ash-coloered, cracked; leaves roundish, leathery, smooth, 6 inches long, and as many broad; flowers in lateral compound racemes; drupes 2 to 3, globose.

P. P.—The fruit commonly known under the name of Cocculus Indicus is roundish, about the size of a large pea, with a dark-brown, wrinkled perisperm, within which is the bivalved, one-celled fruit; the kernel is white and oily, and does not completely fill the shell. It is void of odour, but has an intensely bitter taste.

C. P.—The nucleus contains a peculiar, white, crystalline acid, which has been named *Picrotoxin*, resin, gum, a fatty acid, and other unimportant substances. Picrotoxin is the active principle; it is soluble in 150 parts of temperate water, 25 of boiling water, 2 of pure ether, and 3 of alcohol; it is insoluble in the fixed and volatile oils; its composition is $C^{12}H^{7}O^{5}$. Cocculus Indicus yields its active properties to alcohol, and but very imperfectly to either cold or boiling water.

Adulterations.—As met with in commerce, either from having been gathered before it is quite ripe or from long keeping, the kernel often is completely dried up, so as to leave the shell nearly, if not quite empty. The *Edinburgh College*, therefore, directs "that the kernels should fill at least two thirds of the fruit."

Th. E.—Cocculus Indicus is a powerful stimulant, in large doses producing death, with tetanic convulsions and coma. It is used in India to poison fish; and in Great Britain is often nefariously employed by brewers to give an artificial strength to beer. In medicine it is only employed externally to destroy vermin, and as a stimulating application, in the form of ointment, to furfuraceous eczema and porrigo of the scalp. Picrotoxin is highly poisonous; it may be used as a substitute for the drug.—*Unguentum Cocculi*, E. (Take any convenient quantity of Cocculus Indicus, separate and preserve the kernels, beat them well in a mortar, first alone, and then with a little axunge; and then add axunge till it amounts altogether to five times the weight of the kernels.)—*Unguentum Picrotoxin*, Jager. (Picrotoxin, gr. x.; axunge, ʒi.; mix intimately.) Either of those ointments may be applied in small quantities to the scalp night and morning in the cases above mentioned, and the head well cleansed with soap and warm water at least once daily. They should be used with great caution when the skin is not entire, as danger may arise from absorption.

Coriandrum, L. E. Coriandrum sativum, semina, D. *Coriander. The fruit* (*seeds*, D.) *of Coriandrum sativum.*—A native of the South of Europe, scarcely indigenous; belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Annual; stem erect, leafy, about 18 inches high; leaves scarcely stalked, all bipinnate, and cut; flowers white, often with a reddish tint.

P. & C. P.—The fruit commonly called *coriander seeds* is round,

about the size of white pepper, finely ribbed, of a brownish-yellow colour. When ripe it has an agreeable, aromatic odour, and a warm, peculiar taste. Its properties depend on volatile oil, of which it contains 4·7 parts in a thousand.

Th. E.—Coriander is employed in medicine as a flavouring adjunct in some officinal preparations. The dose of the seeds is from ʒss. to ʒi.

Cuminum, E. Cyminum, L. *Cummin. The fruit of Cuminum Cyminum.*—A native of Greece and Egypt, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

The fruit of this plant, commonly called *cummin seeds*, possesses aromatic, stimulant properties, which depend on the presence of volatile oil; but, as the odour and taste are both strong and disagreeable, I cannot imagine on what grounds it has been retained in the London and Edinburgh Pharmacopœias, when we have so many agreeable medicines with precisely analogous properties. Dose, of the fruit, gr. x. to ʒss.

Dauci fructus, L. Dauci semina, D. Dauci radix, D. L. E. *The common carrot. Fruit* (*seeds, D.*) *of Daucus Carota* (*var. sylvestris, D.*). *The root of Daucus Carota* (*var. sativa*, E.).—Indigenous, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Root slender, yellowish, becoming thick and succulent by cultivation (*var. sativa*); stem 2 to 3 feet high, hispid; leaves pinnatisect; flowers in large umbels, white, except the central neutral one, which is blood-red.

P. & C. P.—The fruit, commonly called *carrot-seeds*, is obtained from the uncultivated variety; it is small, compressed, ovate, fringed with a row of whitish spines, of a brown colour; it has a strong aromatic odour and taste, which depend on volatile oil. The root which is obtained from the cultivated carrot is too well known to require description. It contains a trace of volatile with some fixed oil, a peculiar, ruby-red, crystalline substance (*Carotin*), uncrystallizable sugar, fecula, albumen, malic acid, &c.

Th. E.—The fruit of the wild carrot is carminative and stimulant, and by many is held to be diuretic; it is scarcely ever used at present. Carrot-root, when boiled, forms one of the most nutritive of our esculent vegetables. In medicine, it is only used as an external application, in the form of poultice, to stimulate foul, indolent, and gangrenous sores; it corrects the fœtor, and promotes the separation of the sloughs.

D. & M. of Adm.—Of the fruit, gr. xx. to ʒij.—*Cataplasma Dauci*, D. (Take of the root of the cultivated carrot, any quantity; boil it in water until it becomes soft enough to form a cataplasm.) Used for the purposes above stated.

Dianthus caryophyllus, flores, D. *Clove-pink. Flowers of Dianthus Caryophyllus.*—Indigenous, belonging to the natural fam-

ily *Caryophyllaceæ*, and to the Linnæan class and order *Decandria Digynia.*

Those flowers were at one time supposed to possess some stimulant properties, and were employed in nervous and spasmodic diseases; but they are never used in the present day.

Electricity. Galvanism. Magnetic Electricity.—Those powerful agents in the treatment of disease require some short notice here. Their operation is that either of a general or local stimulant, according to the manner in which they are applied. Under their influence the vascular and nervous systems are excited; the pulse is increased in frequency, the muscles stimulated to involuntary action, and the general secretions augmented. The diseases, then, in which their use is indicated are those of debility; thus, they are employed with benefit in all forms of paralysis of the nerves, both of sensation and of motion, when uncomplicated with any lesion of, or determination of blood to, the cerebro-spinal system; as in some forms of nervous deafness and of amaurosis, in old cases of paraplegia and hemiplegia, in paralysis of the muscles of the forearm from the poison of lead or mercury, and in asphyxia. In suppression of the menstrual discharge arising from loss of tone in the uterine organs, electrical shocks passed through the pelvis (from the sacrum to the pubis) are frequently productive of great benefit. In the loss of muscular power attendant on chronic rheumatism, and in chorea and other allied convulsive disorders, the employment of electricity also often proves serviceable. In the foregoing cases the different forms of electricity are indifferently applied, but *galvanic* and *magnetic* electricity possess the advantages of being more readily employed, of not being interfered with by the state of the atmosphere, of the effects produced being more under control, and of the facility with which they may be applied to the different parts of the body; consequently, those forms of electricity are in the present day most generally used. For the application of common electricity, Leyden jars charged with the cylindrical or plate machine are used, and the usual directors employed for discharging them; the patient may or may not be placed on an insulating stool or chair, according to the effect which it is wished to produce. Galvanic electricity is applied by means of the usual galvanic troughs and insulated directors; the apparatus is objectionable in consequence of its not being very portable, and also from its requiring the use of acids to bring it into operation. Magnetic electricity is the most convenient and simple mode of employing this agent in the practice of medicine; it is most readily applied by means of the electro-magnetic machine of Mr. Clarke, of London, and from its use very beneficial results have been derived in the treatment of the diseases above mentioned. The good effects of any of the forms of electricity require a long time for their development, and, consequently, its use should be persevered in for some time, and not despaired of if immediate relief be not experienced. Care must, however, be taken to regulate the force

or intensity of the shock, as over-excitement from electricity in general proves highly injurious in those very cases in which its employment, properly regulated, is attended with the greatest service. In fine, it should be always borne in mind, that electricity is only to be considered as an auxiliary to other modes of treatment.

Elemi, L. E. Amyris elemifera, resina, D. *Elemi. Concrete resinous exudation from one or more unascertained plants*, E. *Resin of Amyris elemifera*, D. L.—It is quite uncertain from what plant this substance is obtained, and even its commercial route is involved in much obscurity; what is met with in Great Britain is brought from Holland. The term elemi is applied to three or four resins of very different appearance, and much of what is sold under this name appears to be a very composite substance. It is only employed in medicine in the form of ointment, as a stimulating dressing to old and indolent ulcers.—*Unguentum Elemi*, D. L. ("Elemi, ℔j.; white wax, ℔ss.; prepared hog's lard, ℔iv.; make an ointment, which, while yet hot, should be strained through a sieve," D. "Elemi, ℔j.; common turpentine, ʒx.; suet, ℔ij.; olive oil, fʒij.; melt the elemi with the suet; then remove them from the fire, and immediately mix with them the turpentine and the oil; afterward press through a linen cloth," L.

Fœniculum, L. E. Anethum fœniculum, semina, D. *Fennel. Fruit of Fœniculum officinale*, E. *Fruit of Fœniculum vulgare*, L. *Seeds of Anethum Fœniculum*, D.—*F. vulgare* (*A. Fœniculum*, Linnæus) is an indigenous plant, belonging to the natural family *Umbelliferæ*, and to the Linnæan class and order *Pentandria Digynia*.

B. C.—Biennial; stem 3 to 4 feet high, fistulose; leaves much divided, with very slender segments; flowers dark yellow.

P. & C. P.—The fruit, commonly called fennel seed, is oval, about two lines long and one broad, of a dark-brown colour; it has an agreeable, aromatic odour, and a warm, sweetish, somewhat acrid taste. Those properties depend on a volatile oil. The oil of fennel of the shops is usually obtained from a cultivated variety of *F. vulgare*, which, in consequence of the sweeter taste of the fruit, is known under the name of *F. dulce*.

Th. E.—Fennel is a warm, aromatic stimulant, but is not much used in the present day; it may be employed in the same cases as anise and caraway.

D. & M. of Adm.—In substance, ʒss. to ʒi. *Oleum Fœniculi*, D. E. (Prepared from the fruit (seeds of *F. dulce*, D.), according to the general instructions for obtaining volatile oils.) Dose, min. ij. to min. x.—*Aqua Fœniculi*, D. L. E. (Prepared in the same way as Aqua carui, D. L.; as Aqua anethi, E.) An aromatic vehicle for other medicines. Dose, fʒj. to fʒiv.

Inula, L. Inula Helenium, radix, D. *Elecampane. Root of*

Inula Helenium.—Indigenous, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua.*

B. C.—Root thick, branching, perennial; stem 3 to 5 feet high, branched; leaves amplexicaul, ovate, wrinkled, downy beneath; flower large, terminal, bright yellow.

P. & C. P.—Elecampane root, when dried, has an aromatic odour, and a warm, bitter taste. It consists of bitter extractive, soft resin, elecampane camphor (*Helenin*), a variety of starch named *Inulin*, a trace of volatile oil, &c. It yields its active properties partially to water, but more completely to alcohol.

Th. E.—Elecampane is an aromatic stimulant, producing vomiting in large doses. It is scarcely ever used in medicine, and might well be spared from the pharmacopœias. Dose, ℈i. to ʒij.

Laurus nobilis, folia et baccæ, D. L. *Sweet bay leaves and berries. Leaves and berries of Laurus Nobilis.*—A native of the South of Europe, cultivated in our shrubberies; it belongs to the natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia.*

B. C.—A small tree; leaves alternate, lanceolate, coriaceous; flowers in axillary umbels, yellowish; fruit a bluish black, oval berry, one-seeded, about the size of a small nut.

P. & C. P.—The leaves and fruit have an aromatic, rather agreeable odour, and a warm, somewhat bitter taste. These properties depend on a volatile oil, which may be obtained by distillation. The berries also contain about 12 per cent. of a butyraceous fixed oil, which has been recently imported from Trieste.

Th. E.—The leaves, berries, and oils of the sweet bay are aromatic stimulants, but are scarcely ever employed in medicine. The leaves and berries may be administered in the form of infusion, prepared by infusing ʒiss. of either, bruised, in fʒxij. of boiling water. Dose, fʒss. to fʒij.

Lavandula, L. E. Lavandula spica, flores, D. *Lavender. Flowers of Lavandula Spicæ*, D. L.—*of Lavandula vera*, E.—It is from *L. vera* (De Candolle) that the flowers are procured for medical use; this is a native of the central parts of Europe, and is cultivated in our gardens; it belongs to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—Stem shrubby, 1 to 2 feet high; leaves oblong-linear or lanceolate, quite entire; flowers purplish gray, in whorls of 6 to 10 flowers, in interrupted spikes. It may be readily distinguished from *L. Spica* by its taller stature, its narrower leaves, and the absence of bracts.

P. & C. P.—The flowers are gathered when in full bloom, and dried in the shade: they have a peculiar, fragrant odour, and a warm, somewhat bitter, aromatic taste. They contain volatile oil, tannin, bitter extractive, and woody fibre. The oil *Oleum Lavandulæ*, D. L. E., is obtained by the usual process of distillation; it is of a pale-yellow colour, has the peculiar fragrant odour of the flowers, and a warm, aromatic taste. One pound of flowers yields about two drachms of oil. Its density is about ·900; its composi-

tion, according to Kane, is $C^{10}H^{14}O^2$. Lavender flowers yield their properties completely to alcohol, but only partially to boiling water.

Th. E.—Lavender is a very agreeable, aromatic stimulant, and, consequently, its officinal preparations are much employed for giving warmth and flavour to other medicines.

D. & M. of Adm.—The flowers, in powder, are added to sternutatories, on account of their agreeable odour.—*Oleum Lavandulæ*, D. L. E. Dose, min. ij. to min. v.—*Spiritus Lavandulæ*, D. L. E. (Fresh lavender, ℔ij. (℔iiss., L. E.); proof (rectified, L. E.) spirit, cong. j.; (water, sufficient to prevent empyreuma, D.; Oij., L.); "macerate for 24 hours, and distil with a medium heat ℔v. *by measure*," D. "Mix, and with a slow fire distil a gallon," L. "Mix, and with the heat of a vapour-bath distil over Ovij.," E.) Used in the preparation of the following: *Spiritus* (*Tinctura*, L.) *Lavandulæ comp.* (Spirit of lavender, *by measure*, ℔iij. (Oiss., L.; Oij., E.); spirit of rosemary, *by measure*, ℔j. (Oss., L.; f℥xij., E.); nutmegs, bruised, ℥ss. (ʒiiss., L.); cinnamon, bruised (in coarse powder, E.), ℥ss. (ʒiiss., L.; ℥j., E.); (cloves, bruised, ʒij., D. E.); red sandal-wood shavings, ℥i. (ʒv., L.; ʒiij., E.); macerate (digest, D.) for 10 (14, L.; 7, E.) days, and strain; "strain through calico," E.) This preparation, generally known as *Lavender Drops*, is used as a cordial and stomachic to relieve nausea, flatulence, lowness of spirits, &c. Dose, min. xxx. to fʒij. in water, or dropped on white sugar.

Limonum cortex et oleum, L. E. Citrus medica, tunica exterior et ejus oleum volatile, D. *The external rind of the fruit, and the volatile oil obtained from the rind, of Citrus Limonum*, L. E.—*of Citrus Medica*, D. *Lemon peel, and oil of lemons.*—The lemon-tree has been described in the division *Refrigerants*. *Oil of lemons* is obtained from the rind either by distillation or expression; the latter is the method usually followed; it is imported from Portugal and from France. It has a pale greenish-yellow colour, the fragrant odour of lemons, and a pungent, aromatic taste; density, 0·847. Its composition is $C^{10}H^8$. *Lemon peel* is of a yellow colour, has an agreeable, aromatic odour, and a warm, somewhat bitter taste, both of which are much injured by drying. Care should be taken in peeling lemons to remove only the outer yellow rind; it should be dried without artificial heat, and is best preserved in well-closed bottles, in alternate layers, with sugar. Lemon peel yields its properties to both alcohol and water.

Th. E.—Oil of lemons is an aromatic stimulant; it is only used internally to give an agreeable flavour to other medicines; as a topical remedy, it is highly praised by the Germans as a stimulant in rheumatic and scrofulous ophthalmia, for which purpose it is dropped into the eye. Lemon peel is employed as a flavouring ingredient in infusions. The dose of oil of lemons is from min. ij. to min. v.

Mastiche, D. L. E. *Mastich. The resin* (*Concrete resinous*

exudation, E.) *of Pistacia Lentiscus.*—A native of the South of Europe and of the Levant, belonging to the natural family *Anacardiaceæ*, and to the Linnæan class and order *Diœcia Pentandria.*

Mastich exudes from incisions made into the tree; it is in small, irregular, yellowish tears, which have a faint, agreeable odour, and a warm taste. It is scarcely ever used at present, but was at one time much employed as an ingredient in *dinner pills.* It enters into the composition of the *Tinctura Ammoniæ comp.*, L. (See page 349.)

Melissa, E. Melissa officinalis, herba, D. *Common Balm. Herb of Melissa officinalis.*—A native of Central Europe, cultivated in our gardens; it belongs to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—Herbaceous; leaves broadly ovate, crenate, hairy above, smooth beneath; flowers white, in one-sided, axillary whorls, shortly pedunculated.

P. & C. P.—In the recent state, the whole herb has an aromatic, citron-like odour, much of which is lost by drying; the taste is warm and bitter. It contains volatile oil, resin, bitter extractive, a trace of tannin, gum, &c. It yields its properties to boiling water by infusion.

Th. E.—Balm is a mild aromatic stimulant, at present never used except as a domestic remedy. *Infusum Melissæ; Balm tea* (prepared by infusing ʒij. of the fresh herb in Oss. of boiling water for a quarter of an hour) is given in doses of from fʒij. to fʒiv.

Mentha piperita, herba, D. L. E. *Peppermint. Herb of Mentha piperita.*—Indigenous, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—Root creeping; stem smooth, quadrangular; leaves ovato-lanceolate, strongly serrated, acute, slightly hairy; flowers violet coloured, in lax, short, interrupted spikes; bracteas lanceolate.

P. & C. P.—Peppermint has a peculiar, aromatic, to most persons agreeable odour, and a warm, pungent taste, leaving a peculiar impression of coldness on the mouth, which is most marked during inspiration. Those properties are due to a large quantity of volatile oil, which exists in small vesicles or glands, chiefly in the leaves. This oil, *Oleum Menthæ Piperitæ*, D. L. E., is obtained by the usual process of distillation; the quantity procured varies from a 200th to a 320th; it is limpid and colourless, acquiring a greenish tint from age, with the odour and taste of the plant in an intense degree. It is soluble in alcohol, and agitated with water it imparts to it both odour and taste. Its density is 0·902; and its composition $C^{21}H^{20}O^{2}$ (Kane).

Th. E.—Peppermint is perhaps the most powerful aromatic stimulant of the Labiate plants, and, in consequence of its agreeable odour and taste, is very generally added to nauseous medicines. It is also much employed to relieve sickness of the stomach, heartburn, and flatulent colic.

D. & M. of Adm.—Of the volatile oil, min. ij. to min. v. dropped

on sugar.—*Aqua Menthæ piperitæ*, D. L. E. ("Herb of peppermint, ℔iss.; water, sufficient to prevent empyreuma; distil a gallon," D. "Peppermint, dried, ℔ij. (or oil of peppermint, ʒij.); proof spirit, fʒvij.; water, cong. ij.; distil a gallon," L. "Peppermint, ℔iv., if fresh (℔ij. if dry); water, cong. ij.; rectified spirit, fʒiij.; mix, and distil one gallon," E.) Employed to relieve flatulent colic, but chiefly as a vehicle for other medicines. Dose, fʒj. to fʒij.—*Spiritus Menthæ piperitæ*, D. L. *Sp. Menthæ*, E. ("Oil of peppermint, *by weight*, ʒss. (ʒij., L.); rectified (proof, L.) spirit, cong. j.; water, sufficient to prevent empyreuma (Oj., L.); mix, and with a slow fire distil a gallon," D. L. "Fresh peppermint, ℔iss.; proceed as for spirit of caraway," E.) Stimulant and carminative. Dose, fʒss. to fʒi.—*Essence of peppermint* of the shops is prepared by dissolving fʒi. of the oil in fʒi. of rectified spirit; the dose is from gtt. xx. to gtt. xxx. on sugar.

Mentha pulegium, herba, D. L. Pulegium, E. *Pennyroyal. Herb of Mentha Pulegium.*—Indigenous, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—This mint is distinguished by its prostrate stems, and small, frequently recurved leaves, both of which are thickly covered with short hairs.

P. & C. P.—Pennyroyal has a strong, peculiar, aromatic odour, and a pungent, somewhat bitter, cooling taste; it contains a volatile oil, on which its properties depend, and which is obtained by the usual process of distillation; it is of a pale greenish-yellow colour, with the odour and taste of the plant. Its density is 0·925, and its composition $C^{10}H^{8}O$ (Kane).

Th. E.—Pennyroyal is identical in action with peppermint, but, as its odour and taste are not so agreeable, it is much less used.

D. & M. of Adm.—*Oleum Menthæ Pulegii*, D. L. E.—*Spiritus Menthæ Pulegii*, L.—*Aqua Menthæ Pulegii*, D. L. E.—*Essence of pennyroyal* of the shops, are all prepared with pennyroyal in the same manner as the corresponding preparations of peppermint. The doses, also, are the same.

Mentha viridis, herba, D. L. E. *Spearmint. Herb of Mentha viridis.*—Indigenous, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia.*

B. C.—Leaves lanceolate, acute, glabrous, sessile; spikes interrupted, cylindrical, loose; bracteas setaceous, somewhat hairy, as well as the calyx.

P. & C. P.—Spearmint has a strong, peculiar, to many persons disagreeable odour, and a warm, bitter taste, followed by a sense of coldness when air is drawn into the mouth; much of those properties is lost by drying. They depend on a volatile oil, of which the fresh herb contains only a 500th part. This oil is of a light-yellow colour, acquiring a reddish-brown tint by age; it possesses intensely the odour and taste of the plant. Its density is 0·914, and its composition $C^{20}H^{28}O$ (Kane).

Th. E.—Spearmint resembles in its action peppermint; by some

it has been said to repel the secretion of milk, and to act as an emmenagogue. As it is neither as powerful nor as agreeable as peppermint, it is not so much used.

D. & M. of Adm.—*Oleum Menthæ viridis*, D. L. E.—*Spiritus Menthæ viridis*, D. L. E.—*Aqua Menthæ viridis*, D. L. E.—*Essence of spearmint* of the shops, are all prepared with spearmint, in the same manner as the corresponding preparations of peppermint. The doses, also, are the same.—*Infusum Menthæ simplex*, D. (Dried spearmint leaves, ʒij.; boiling water, a sufficient quantity to afford fʒvj. of strained liquor.) Used as a vehicle for other remedies in an irritable state of the stomach. Dose, fʒi. to fʒij.—*Infusum Menthæ comp.*, D. (Dried spearmint leaves, ʒij.; boiling water, a sufficient quantity to afford fʒvj. of strained liquor; digest for half an hour in a covered vessel, and strain when cold; then add, pure sugar, ʒij.; oil of spearmint, gtt. iij., dissolved in fʒss. of compound tincture of cardamoms, and mix.) Stomachic and stimulant; useful in nausea and flatulent colic, and to conceal the taste of other medicines. Dose, fʒi. to fʒiij.

Myristica, L. E. Myristicæ oleum, L. E. Myristicæ adeps, E. Myristica moschata, nucleus, oleum volatile, et involucrum macis dictum, D. *Nutmegs. Kernel of the fruit and volatile oil from the kernel*, D. L. E. *Involucrum* (*arillus*) *of the nut* (*mace*), D. *And concrete expressed oil* (*oil of mace*) *from the kernel of the fruit*, E.—*of Myristica moschata*, D. L.—*of Myristica officinalis*, E.—A native of the Molucca Islands, belonging to the natural family *Myristicaceæ* and to the Linnæan class and order *Diœcia Monadelphia*.

B. C.—A tree, 20 to 30 feet high; leaves aromatic, oblong, acuminate, smooth, simply nerved; flowers pale yellow, in axillary racemes; fruit pyriform, about the size of a peach, smooth, dehiscing by two nearly equal longitudinal valves, and exposing the fleshy, scarlet arillus (*mace*), closely embracing the shell, within which it contained the kernel (*the nutmeg*).

P. & C. P.—Nutmegs and mace are too well known to require description; they are imported from the Moluccas. They have a peculiar, fragrant, powerful odour, and a warm, aromatic taste. Nutmegs consist of 31·6 per cent. of fat butyraceous fixed oil, 6 of volatile oil, 2·4 of starch, 1·2 of gum, 0·8 of acid, and 54 of lignin (Bonastre). The volatile oil, *Oleum Myristicæ*, D. L. E., is obtained by distillation; it is usually imported. It is colourless or slightly yellow, of a rather viscid consistence, and has the odour and taste of nutmegs. Its density is 0·948. The fixed oil, *Myristicæ Adeps*, E., *oil of mace*, is procured by exposing bruised nutmegs to the vapour of boiling water, and pressing between heated plates of iron; it is imported in large rectangular cakes, covered with the leaves of some monocotyledonous plants. It is a soft solid, of a reddish-yellow colour, with the odour and taste of nutmegs. It consists of an aromatic volatile oil, mixed with three fats, two of which are readily dissolved by alcohol, and the third which is thus separated has been named *myristicine*. Mace is composed of vol-

atile oil, red fat oil soluble in alcohol, yellow fat oil insoluble in alcohol, alcoholic extractive, amidin, lignin, &c. Nutmegs and mace impart both odour and taste to boiling water; but they yield their active properties more completely to alcohol.

Adulterations.—Nutmegs from which the volatile oil has been obtained are sometimes mixed with good nutmegs, the holes which were bored in them being stopped up with powdered sassafras. This fraud is seldom attempted in the present day; it may be detected by the lightness of the nutmeg. Those nutmegs which are round, plump, heavy, and not worm-eaten, should be chosen.

Th. E.—Nutmegs are agreeable, aromatic stimulants, chiefly used as flavouring ingredients. Taken in large quantity, they prove narcotic, and, consequently, their use should be avoided by those who have an apoplectic or paralytic tendency. The fixed oil has been employed externally as a stimulant in chronic rheumatism and paralysis. Mace is not used in medicine; its properties are similar to those of nutmegs.

D. & M. of Adm.—In substance, gr. x. to gr. xxx.—*Oleum Myristicæ*, D. L. E. Min. j. to min. v., dropped on sugar.—*Spiritus nucis Moschatæ*, D. *Sp. Myristicæ*, L. E. (Nutmegs, bruised, ʒij. (ʒiiss., L. E.); proof spirit, cong. j.; water, sufficient to prevent empyreuma (Oj., L. E.); mix (macerate for 24 hours, D.), and (with a slow fire, L.) distil a gallon.) Stimulant and aromatic; an excellent addition to cathartic mixtures, to prevent griping. It may be prepared extemporaneously by dissolving min xx. of the volatile oil in fʒi. of proof spirit. Dose, fʒi. to fʒiv.

Olibanum, D. L. *Gum-resin of Boswellia Serrata.*—A handsome, lofty tree, a native of Coromandel and other parts of the East Indies, belonging to the natural family *Anacardiaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

Olibanum is met with in the form of irregularly-rounded, whitish or yellowish tears, semi-transparent, powdery on the surface; they have a fragrant odour, and an aromatic, somewhat bitter taste. They consist principally of volatile oil and resin, and are insoluble in either water or alcohol. This substance is the true frankincense of the ancients; it possesses mildly stimulant properties, but in the present day is only employed as a fumigating agent. The dose for internal use would be from ʒss. to ʒi., made into an emulsion with yolk of egg or with mucilage.

Origanum, L. E. Origanum vulgare, oleum ex herba, D. Origanum majorana, herba, D. *Herb* (*Volatile oil*, D.) *of Origanum vulgare*, D. L. E. *Herb of Origanum Mojorana*, D.—*O. vulgare*, the common marjoram, is an indigenous plant, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Didynamia Gymnospermia. O. Majorana*, or sweet marjoram, is a native of Africa and of Asia, and is commonly cultivated in Great Britain as a pot-herb.

P. & C. P.—Both plants have a peculiar, aromatic odour, that

of the latter being much stronger, and a warm, pungent taste; these properties chiefly depend on volatile oil.—*Oleum Origani*, D. L., *Oil of Marjoram, Oil of Thyme*, is obtained from *Origanum vulgare* by the usual process of distillation. It is of a reddish colour, becoming darker by age, and has the odour and taste of the herb. Its density is 0·867, and its composition $C^{50}H^{40}O$. A hundredweight of the plant yields, on an average, from 8 to 10 ounces of oil.

Th. E.—The marjorams possess the aromatic, stimulant properties of the Labiate plants generally. In the present day they are but seldom used in medicine; the oil may be given in doses of from min. j. to min. iij. dropped on sugar. It is sometimes employed to relieve the toothache, dropped on cotton and placed in the hollow of a carious tooth. Dissolved in olive oil, it is used as a stimulating embrocation.

Pimenta, D. L. E. *Pimento; Allspice; Jamaica pepper. Fruit (dried unripe berries,* L.) *of Myrtus Pimenta*, D. L. *Unripe berries of Eugenia Pimenta*, E.—A native of the West Indies, belonging to the natural family *Myrtaceæ*, and to the Linnæan class and order *Icosandria Monogynia*.

B. C.—A handsome tree, about 30 feet high; leaves oblong, pellucid-dotted, about 4 inches long; flowers numerous, greenish yellow, in terminal bunches or panicles; berry succulent, dark purple when ripe, 2-seeded.

P. & C. P.—Pimento is in the form of round blackish berries, rough, umbilicated with the persistent teeth of the calyx. The odour resembles a mixture of cloves, cinnamon, and nutmegs, whence the name *allspice;* the taste is pungent and aromatic, like that of cloves. Those properties depend principally on volatile oil, of which Bonastre obtained 10 per cent. from the husk, and only 5 per cent. from the kernel. This oil, *Oleum Pimentæ*, D. L. E., is obtained from the berries by the usual process of distillation; it is of a yellowish colour when first drawn, but soon acquires a reddish tint; it has the peculiar odour of allspice, and a burning, aromatic taste. Oil of allspice of commerce is heavier than water, its density being about 1·020. It is a mixture of a heavy and light oil, which may be obtained separately by distillation with solution of potash, as the former forms crystalline compounds with the alkalies. Pimento communicates both odour and taste to boiling water, but it yields its properties more completely to alcohol.

Th. E.—Pimento is an aromatic stimulant, not much employed in medicine. Its preparations are chiefly used to communicate warmth and flavour to other substances.

D. & M. or Adm.—In substance, from ʒss. to ʒj.—*Oleum Pimentæ*, D. L. E., min. ij. to min. v.—*Spiritus Pimentæ*, D. L. E. (Pimento, bruised, ℥iij. (℥iiss., L.; ℔ss., E.); proceed as for spirit of nutmeg, D. L.; as for spirit of caraway, E.) Dose, fʒj. to fʒij. —*Aqua Pimentæ*, D. L. E. ("Pimento, bruised, ℔ss.; water, sufficient to prevent empyreuma; macerate for 24 hours, and distil a gallon," D. "Pimento, bruised, ℔i. (or oil of pimento, ʒij., L.);

proof (rectified, E.) spirit, f℥vij. (f℥iij., E.); water, cong. ij.; mix, and distil a gallon," L. E.) Carminative and stimulant; used in the flatulent colic of children, and as a vehicle for other medicines. Dose, f℥i. to f℥ij.

PIPER LONGUM, D. L. E. *Long pepper. Dried spikes* (*dried unripe fruit*, L.; *seeds*, D.) *of Piper Longum.*—A native of India, belonging to the natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

B. C.—A small shrubby climber; leaves alternate, petiolate, ovato-cordate; flowers small, closely set on the axillary spadices.

P. & C. P.—Long pepper consists of the spadices, which are gathered before they are fully ripe, and dried in the sun. As met with in commerce, they are of a grayish colour, hard, about an inch and a half in length, cylindrical, striated diagonally on their surface. They have a somewhat aromatic odour, and a very pungent, spicy taste. The composition of long pepper is almost identical with that of black pepper. (See next article.)

TH. E.—This pepper is somewhat more acrid than *Piper nigrum*, but it may be employed in the same cases. Dose, gr. v. to ℈i.

PIPER NIGRUM, D. L. E. *Black pepper. Dried unripe berries* (*berries*, L.; *seeds*, D.) *of Piper Nigrum.*—A native of the continent of India, cultivated in the East and West India Islands; it belongs to the natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

B. C.—Stem shrubby, climbing, 8 to 12 feet long, jointed, dichotomous; leaves elliptical, acuminate, 5 to 7 nerved; flowers whitish, small, covering thickly a cylyndrical, pendulous spadix; fruit distinct, at first green, changing as it ripens to bright red, and, finally, to black.

P. P.—Before the berries on each spike have all changed to red, tney are collected and dried in the sun, to constitute black pepper. White pepper is procured by soaking the fully ripe seeds in water, so as to enable the outer husk to be afterward removed by rubbing. Black pepper consists of small spherical bodies, blackish and rough externally, whitish within, consisting of the outer wrinkled tegument, surrounding the hard, smooth seed. It has a strong, peculiar, aromatic odour, and a very pungent, acrid taste.

C. P.—Black pepper is composed of a neutral crystalline principle, which has been named *Piperin*, of a very acrid, soft resin, balsamic volatile oil, extractive, gum, bassorin, starch, malic and tartaric acids, &c. The active principles are the *piperin*, resin, and volatile oil. Piperin may be readily prepared by Pontet's process, as follows: "Prepare an alcoholic extract of black pepper, digest in a solution of caustic potash, and agitate with water; filter and wash carefully with water what remains on the filter; dissolve it in warm alcohol, and crystallize by cooling." As usually met with, piperin is a dark-yellow, resinous-looking substance, but it may be obtained in transparent, colourless, four-sided prisms; it is tasteless and inodorous, is insoluble in cold water, dissolves sparingly in

boiling water or cold alcohol, but is very soluble in boiling alcohol; it melts at 212°; it is a neutral principle; its composition is $C^{34}H^{19}O^{6}N$. Black pepper imparts its properties partially to water, but more completely to alcohol.

Th. E.—Pepper is an acrid, aromatic stimulant, in general use as a spice. It also possesses remarkable febrifuge properties, which reside in the piperin. This substance has been employed with much success in the treatment of ague, and has succeeded in many instances in effecting a cure in cases where quina and other remedies have failed. An interesting account of the employment of piperin in the treatment of intermittent fevers in the Island of Trinidad, by Dr. Hartle, has been published in the 55th vol. of the Edinburgh Medical Journal. As a stimulant, black pepper will be found a useful addition to bitters in atony of the digestive organs; externally it is used in the form of ointment to chronic diseases of the scalp, and as an adjunct to rubefacient cataplasms.

D. & M. of Adm.—In substance, gr. v. to gr. xx.—*Piperin* is given in doses of gr. iij. to gr. v. every hour until gr. xviij. have been taken. It may be made into pill with mucilage or conserve of roses.—*Confectio Piperis Nigri*, D. L. E. (Black pepper and elecampane root (liquorice root, E.), of each, ℔i.; fennel seeds, ℔iij.; honey and white sugar, of each, ℔ij.; rub the dry ingredients together to a very fine powder; "add water, ℔j.; and beat into a uniform mass," D. "Keep in a covered vessel, and whenever the confection is to be used, the honey being added, pound them until they are thoroughly incorporated," L. "Beat the whole into a uniform mass," E.) This preparation was introduced into the Pharmacopœias as a substitute for a quack medicine called *Ward's paste for piles*. It will be found useful in hemorrhoids occurring in the weak and debilitated. Dose, ʒi. to ʒij.; to derive any benefit from its use, it must be persevered in for two or three months.—*Unguentum Piperis Nigri*, D. (Prepared hog's lard, ℔j.; black pepper, in powder, ʒiv.; make into an ointment.) At one time highly praised as a remedy for chronic diseases of the scalp.—*Rubefacient Cataplasm*, Paris Codex. (Barley-meal, ʒiv.; vinegar, ʒi.; whites of three eggs; water, sufficient to make a cataplasm of a proper consistence; spread on linen, and sprinkle over it an ounce and a half each of black pepper and of fennel in fine powder.) A speedy rubefacient.

Porrum, L. *The Leek. Bulb of Allium Porrum.*—A native of Egypt, cultivated in our gardens; it belongs to the natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia*. The leek is never used in medicine, although retained in the London Pharmacopœia.

Potassii sulphuretum, L. E. Potassæ sulphuretum, D. *Sulphuret of Potassium. Liver of Sulphur.*

P. P.—This preparation occurs in various-sized pieces, of a liver-brown colour, hard and fragile; inodorous when quite free from

moisture, but emitting the disagreeable odour of sulphuretted hydrogen when moistened. It has an acrid, bitter, alkaline taste.

C. P.—It is a mixture of 3 eq. of tersulphuret of potassium, and 1 of sulphate of potash ($3\,KS^3+KO,\,SO^3$). By exposure to the air it deliquesces, attracts oxygen, and is all converted into sulphate of potash, becoming white and inodorous. It is readily soluble in water; the solution is of a yellow colour, and highly alkaline.

Prep.—D. L. E. "Carbonate of potash, ʒiv. (4 parts, D.); sublimed sulphur, ʒj. (1 part, D.); rub them together; and in a covered crucible place them on a fire (the heat being gradually increased, D.) until they unite." (Preserve in well-closed vessels. D. Break to pieces, and keep in well-closed bottles, E.)

Th. E.—In large doses, sulphuret of potassium acts as a powerful narcotico-acrid poison, a few drachms producing death, with convulsions and tetanic spasms. In small doses it operates as a general stimulant, and as such is employed on the Continent in the advanced stages of hoopingcough, in chronic rheumatism, in rebellious skin diseases, &c.; but in Great Britain it is rarely used as an internal remedy. As a topical remedy, it is applied dissolved in water in the form of lotion or bath, or made into an ointment with axunge in chronic cutaneous diseases, principally those of a scaly character, and in the obstinate eruptions which affect the scalp.

D. & M. of Adm.—For internal use, gr. iij. to gr. x., dissolved in some aromatic water and sweetened with sirup.—*Potassæ sulphureti aqua*, D. (Washed sulphur, 1 part; water of caustic potash, 11 parts; boil for ten minutes and filter through paper; preserve the liquor in well-closed vessels; its specific gravity is 1·117.) This preparation is similar to that formed by dissolving sulphuret of potash in water. Dose, min. x. to fʒi., diluted with water.—*Balneum Sulphuratum*, Rayer. (Sulphuret of potassium, ʒiv.; tepid water, cong. xxx.; dissolve in wooden vessels.) This may be employed as a local or general bath in skin diseases.—*Unguentum Potassii Sulphureti*, Devergie. (Solution of sulphuret of potash, 12 parts; carbonate of potash, 8 parts; axunge, 30 parts; mix.) For scabies and other cutaneous diseases.

Incomp.—The acids, and most metallic solutions.

In cases of poisoning with this substance, the best antidotes are solutions of chlorinated lime or chlorinated soda, with emollient drinks.

Rosmarinus, L. E. Rosmarinus officinalis, cacumina, D. *Rosemary. The tops of Rosmarinus officinalis.*—A native of the South of Europe, belonging to the natural family *Labiatæ*, and to the Linnæan class and order *Diandria Monogynia.*

B. C.—A shrub, 6 to 8 feet high; leaves evergreen, sessile, lanceolate, revolute at the edge, glabrous on the upper surface, tomentose beneath; flowers pale blue, in small spikes at the extremities of the young branches.

P. & C. P.—The dried tops have an aromatic, agreeable odour, somewhat resembling peppermint, and a warm, pungent, bitter taste. These properties depend chiefly on volatile oil, of which a pound of the fresh plant yields about one drachm. This oil, *Oleum*

Rosmarini, D. L. E., is obtained by the usual process of distillation; it is limpid and colourless, with the odour and taste of the herb in an intense degree. Its density is 0·897, and its composition $C^{45}H^{38}O^{2}$ (Kane). Rosemary tops communicate their odour to boiling water, but more completely to spirit.

Adulterations.—Oil of rosemary is often adulterated with oil of turpentine; the fraud may be detected by the odour when dropped on a heated spatula, or by its not being completely soluble in alcohol.

Th. E.—Rosemary possesses the aromatic, stimulant properties of the Labiate plants before described, and may be used for the same purposes. The oil is frequently added to stimulating liniments, principally on account of its odour.

D. & M. of Adm.—*Oleum Rosmarini*, D. L. E., min. ij. to min. v. dropped on sugar.—*Spiritus Rosmarini*, D. L. E. ("Fresh rosemary tops, ℔iss.; proof spirit, cong. j.; distil with a medium heat ℔v.," D. "Oil of rosemary, ʒij.; rectified spirit, cong. j.; water, Oj.; mix, and with a slow fire distil a gallon," L. "Rosemary, ℔ij.; proceed as for spirit of lavender," E.) Seldom used internally. Dose, min. x. to min. xx.

Sabadilla.—*Cevadilla* (described in the division *Anthelmintics*) is a powerful stimulant, and as such is used in the form of tincture as an external application in chronic rheumatism and paralysis, and over the region of the heart in hysterical and nervous palpitations. The powder of the seeds is employed to destroy pediculi; but its application is not unattended with danger, especially if the skin be broken. The active principle of cevadilla, as before mentioned, is *veratria*, and it was principally as a means of affording that alkaloid that it was introduced into the London and Edinburgh Pharmacopœias. The following are the processes directed to be followed:

Veratria.—*Lond.* "Cevadilla, bruised, ℔ij.; rectified spirit, cong. iij.; diluted sulphuric acid, solution of ammonia, purified animal charcoal, and magnesia, of each, a sufficiency; boil the cevadilla with a gallon of the spirit for an hour in a retort, to which a receiver is fitted. Pour off the liquor, and again boil what remains with another gallon of spirit, and the spirit recently distilled, and pour off the liquor; and let it be done a third time. Press the cevadilla, and let the spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an extract. Boil this three or more times in water, to which a little diluted sulphuric acid is added, and with a gentle heat evaporate the mixed liquors to the proper consistence of a sirup. To this, when cold, put in the magnesia to saturation, frequently shaking them; then press and wash. Let this be done two or three times; then dry what remains, and digest with a gentle heat in spirit two or three times, and strain as often. Afterward let the spirit distil. Boil the residue in water to which a little sulphuric acid and animal charcoal are added, for a quarter of an hour, and strain. Lastly, the charcoal being thoroughly washed, evaporate the mixed liquors cautiously till they have the consistence of a sirup, and add to them as much ammonia as may be sufficient to throw down the Veratria. Wash and dry it." *Edin.* "Take any convenient quantity of cevadilla; pour boiling water over it in a covered vessel, and let it macerate for 24 hours; remove the cevadilla, squeeze it, and dry it thoroughly with a gentle heat. Beat it now in a mortar, and separate the seeds from the capsules by brisk agitation in a deep, narrow vessel. Grind the seeds in a coffee-mill, and form them into a thick paste with rectified spirit. Pack this firmly in a percolator, and pass rectified spirit through it till the spirit ceases to be coloured. Concentrate the spirituous solutions by distillation so long as no de-

posite forms, and pour the residuum, while hot, into 12 times its volume of cold water. Filter through calico, and wash the residuum on the filter so long as the washings precipitate with ammonia. Collect this precipitate on a filter, wash it slightly with cold water, and dry it, first by imbibition with filtering paper, and then in the vapour-bath. A small additional quantity may be got by concentrating the filtered ammoniacal fluid and allowing it to cool. Veratria thus obtained is not pure, but sufficiently so for medical use. From this coloured substance it may be obtained white, but at considerable loss, by solution in very weak muriatic acid, decolorization with animal charcoal, and reprecipitation with ammonia."

P. P.—Veratria is an uncrystallizable solid, pulverulent, as met with in commerce of a grayish-white colour, but it may be obtained perfectly white. It has an intensely acrid taste, and is said to be inodorous, but the smallest quantity applied to the lining membrane of the nostrils provokes violent sneezing.

C. P.—It is composed of $C^{34}H^{21}NO^6$. It is not volatile, nor altered by exposure to the air; it fuses at 230°, and cools into a transparent, yellowish mass. It reacts alkaline, is insoluble in cold water, requires 1000 parts of boiling water for its solution, is sparingly soluble in ether, but very soluble in alcohol. It forms salts with the acids, of which the muriate and the sulphate are alone crystallizable.

Th. E.—In large doses, veratria operates as a powerful irritant poison, causing inflammation of the stomach and intestines when swallowed, and if applied to the surface of the body, producing much irritation. Its action in small or medicinal doses does not appear to be well understood, but it would seem to act as a general stimulant, increased action of the intestines, the kidneys, and the capillaries of the skin often succeeding its administration. Its use in medicine has been hitherto confined to neuralgic diseases, for the treatment of which it was first introduced as an external application by Dr. Turnbull. But the experience of numerous physicians who have tried it on his recommendation not coinciding with his extravagant praises of the remedy, it has fallen into disrepute.

D. & M. of Adm.—*Pulvis Sabadillæ*, gr. j. to gr. v.—*Tinctura Sabadillæ.* (Cevadilla seeds, freed from their capsules, according to the directions of the *Edin. Phar.* for preparing *veratria*, and bruised, any quantity; rectified spirit, as much as will cover them; macerate for ten days, express, and filter.) For external use as an embrocation.—*Extractum Sabadillæ.* (Evaporate the tincture with a gentle heat to a proper consistence.) Dose, gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$, gradually increased. This extract may be advantageously substituted for *veratria.*—*Veratria*, L. E. Dose, gr. $\frac{1}{12}$, increased very cautiously. For an embrocation, ʒi. of the alkaloid may be dissolved in fʒi. of rectified spirit.—*Unguentum Veratriæ*, Turnbull. (Veratria, ʒss.; olive oil, ʒj.; prepared lard, ʒi.; mix.)—*Tinctura Veratriæ*, Magendie. (Veratria, gr. iv.; rectified spirit, fʒi.; mix.) Dose, min. v. to min. xv.

In poisoning with veratria, the treatment is the same as in poisoning with colchicum. (See page 95.)

Scrophularia nodosa, folia, D. *Figwort. Leaves of Scrophularia nodosa.*—Indigenous, belonging to the natural family

Schrophulariaceæ, and to the Linnæan class and order *Didynamia Angiospermia.*

B. C.—Root large, thick, knotty; stem obscurely four-angled, 2 to 3 feet high; leaves heart-shaped, acute, glabrous; flowers greenish-purple, in axillary and terminal panicles. The leaves of this plant are only used in medicine for preparing the following ointment: *Unguentum Scrophulariæ*, D. (Fresh leaves of scrophularia nodosa, prepared hog's lard, of each, ℔ij.; prepared mutton suet, ℔j.; boil the leaves in the fat until they become crisp, and then strain, with expression.) This ointment was introduced into the Pharmacopœia on the authority of Dr. Whitley Stokes, as a remedy for some of the forms of *Pemphigus* and other chronic cutaneous diseases, but it has nearly fallen into disuse

Serpentaria, L. E. Aristolochia serpentaria, radix, D. *Virginia snakeroot Root of Aristolochia Serpentaria.*—A native of North America, belonging to the natural family *Aristolochiaceæ*, and to the Linnæan class and order *Gynandria Hexandria.*

B. C.—Stem simple, flexuous, 8 to 10 inches high; leaves alternate, cordiform, acuminate, slightly pubescent; flowers solitary, reddish-brown.

P. P.—As imported, serpentaria root consists of a tufted head, with numerous attached radicles of a yellowish-brown colour externally, whitish within, with a short resinous fracture. The odour is aromatic, like that of valerian, and the taste warm and camphoraceous.

C. P.—It consists of volatile oil, soft resin, bitter extractive, gum, albumen, starch, and some salts. It yields its properties to water and to alcohol.

Th. E.—Virginia snakeroot, although at one time in great repute, is seldom employed in the present day. It appears to act as a general stimulant, and as such was used in typhoid fevers, in intermittents, in gangrenous affections, in amenorrhœa of the debilitated, &c.

D. & M. of Adm.—In powder, gr. x. to ʒss.—*Infusum Serpentariæ*, L. E. (Serpentaria, ʒss.; boiling (distilled, L.) water, Oj.; macerate (infuse, E.) for 4 hours in a (lightly, L.) covered vessel, and strain.) Dose, fʒi. to fʒij.—*Tinctura Serpentariæ*, D. L. E. ("Serpentaria, bruised (and sliced, D.), ʒiij. (ʒiiiss., L.); proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 7 (14, L.) days, and filter," D. L. "Serpentaria, in moderately fine powder, ʒiiiss.; cochineal, bruised, ʒi.; proof spirit, Oij.; proceed by percolation or digestion as for tincture of Cinchona," E.) Dose, fʒj. to fʒij.

Sodæ chlorinatæ liquor, L. *Solution of Chloride of Soda. Chlorinated Soda; Hypochlorite of Soda; Disinfecting liquor.*

P. P.—This solution is of a yellow colour, with a strong odour of chlorine, and a sharp, astringent taste.

C. P.—Its precise composition has not been ascertained, but it is generally supposed to be a mixture of hypochlorite of soda, bicarbonate of soda, and chloride of sodium. Exposed to the air, chlorine escapes, and crystals of the carbonate of soda are gradually deposited. By evaporation with a gentle heat crystals are obtained, which, by solution in water, afford a liquid with the same properties. It bleaches vegetable colours, first acting as an alkali on

them. This solution may be distinguished from solution of chlorinated lime by its not precipitating with the oxalates or carbonates.

PREP.—"Carbonate of soda, lbi.; distilled water, f℥xlviij.; chloride of sodium, ℥iv.; binoxyde of manganese, ℥iij.; sulphuric acid, ℥iv.; dissolve the carbonate of soda in Oij. of water; then put the chloride of sodium and binoxyde of manganese, rubbed to powder, into a retort; and add to them the sulphuric acid, previously mixed with f℥iij. of water, and cooled. Apply heat to the retort, and pass the chlorine first through f℥v. of water, and afterward into the solution of carbonate of soda above directed," L.

TH. E.—This solution agrees precisely in its properties with hypochlorite of lime, and is employed for the same purposes. (See page 289.) For destroying noxious effluvia, it is to be preferred to that substance, as the salt, *chloride of sodium*, which is left does not deliquesce; while chloride of calcium is very deliquescent. The dose for internal use is min. xx. to min. xxx. in a sufficiency of water, which may be sweetened with sirup.

[*Labarraque's solution of the chloride of sodium* is much employed in France, and has recently been introduced into American practice, in doses of 10 to 20 drops 3 times a day, as a remedy for gout, and with very encouraging results. It is prepared as follows: Take 2 parts of peroxyde of manganese, 8 parts of chlorohydric acid, 15 parts of chlor. of soda, and 60 parts of water. Dissolve the salt in the water, filter, and impregnate the solution with the chlorine gas.]

SODÆ MURIAS, D. E. SODII CHLORIDUM, L. *Common salt. Chloride of sodium. Muriate of soda.* (*Impure commercial chloride of sodium*, E.)

P. P.—Chloride of sodium crystallizes in transparent, colourless cubes; it has an agreeable, saline taste, but no odour. Its density is 2·557.

C. P.—It is composed of 1 eq. of sodium, and 1 of chlorine (Na Cl). It contains no water of crystallization, but heated it decrepitates, owing to some being mechanically lodged between the tables of the crystals. Exposed to a bright red heat, it fuses, and at a white heat volatilizes unchanged. It is permanent in the air when quite pure; it is equally soluble in cold and boiling water, requiring 2·7 parts of water for its solution. It is insoluble in absolute alcohol, but rectified spirit dissolves it slightly. It is neutral to test paper.

PREP.—Chloride of sodium is an article of the Materia Medica in the three British Pharmacopœias. On the large scale, it is procured by dissolving and crystallizing rock salt, or by evaporating sea-water or the water of some mineral springs, in which it is contained in large quantities. The Edinburgh College has given a formula for purifying commercial salt: *Sodæ murias purum*, E. "Take any convenient quantity of muriate of soda, dissolve it in boiling water; filter the solution and boil it down over the fire, skimming off the crystals which form, wash the crystals quickly with cold water, and dry them."

Adulterations.—As met with in Great Britain, common salt does not contain any impurity which can interfere with its use for general or pharmaceutical purposes. Owing to the presence of chloride of magnesium, it is frequently slightly deliquescent. The tests

for its impurity, as given by the Edinburgh College, are as follows: "A solution is not precipitated by solution of carbonate of ammonia followed by solution of phosphate of soda. A solution of gr. ix. in distilled water is not entirely precipitated by a solution of gr. xxvj. of nitrate of silver."

Th. E.—Chloride of sodium, taken internally in moderate quantity, acts as a mild stimulant to the digestive organs, promoting the assimilation of the food; on which account, as well as in consequence of its agreeable flavour, it is used generally by man in all parts of the world as an adjunct to nearly every substance employed by him as an article of diet. It is also said to prove serviceable to the alimentary canal, inasmuch as it prevents the generation of intestinal worms, to which those who use little or no salt with their food are very subject. In somewhat larger doses, it acts as a mild cathartic, forming a principal ingredient in many mineral waters, in which it augments the operation of the other laxative salts. It also proves emetic in doses of one or two ounces; and in one instance, a pound of it taken at once has occasioned death, with all the symptoms of irritant poisoning. Applied to the surface of the body, it acts as a local stimulant, producing rubefaction. Chloride of sodium is not much employed in medicine; as an emetic, it may be administered in narcotic poisoning, in the absence of other substances; as a cathartic, it is not given alone, but is advantageously combined with the other saline cathartics (see page 105); as an anthelmintic, a strong solution has been injected into the rectum to destroy ascarides; as a general stimulant, it is used in some forms of dyspepsia, and in scrofulous and other glandular enlargements; and as a topical agent, it is added to both hot and cold baths, when they are intended to act as local stimulants. In America, a saturated solution of common salt is employed with much success as a lotion in chronic granular ophthalmia. In cholera, and some other diseases in which the saline constituents of the blood are deficient, a solution consisting of ʒij. of the muriate, and ϑij. of carbonate of soda dissolved in fʒlx. of water, has been injected into the veins, but the results were not more successful than those which followed other methods of treatment.

D. & M. of Adm.—As a stimulant, gr. x. to ʒi. As an emetic, ʒi. to ʒij., dissolved in Oj. of water. For baths, ℔j. to ℔ij. may be added to from cong. iij. to cong. v. of either cold or warm water.

Incomp.—Nitrate of silver.

Staphisagria, L. E. Delphinium Staphisagria, semina, D. *Stavesacre. Seeds of Delphinium Staphisagria.*—A native of the South of Europe, belonging to the natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Trigynia.*

B. C.—Stem cylindrical, branching, downy, about 2 feet high; leaves alternate, broad, palmated, smooth on the upper, downy on the under surface; flowers purple, in lax racemes.

P. & C. P.—Stavesacre seeds are about the size of a small pea, irregularly triangular, compressed, dark brown; they have a faint,

unpleasant odour, and a very acrid, bitter taste. Their acridity depends upon an uncrystallizable alkaloid, *delphinia*, which constitutes more than 8 per cent. of the seed. They yield their active properties to boiling water, but more completely to alcohol or to vinegar.

Th. E.—Stavesacre is a powerful irritant, at one time used in medicine as an emetic and anthelmintic, but at present only employed for the destruction of pediculi. An ointment, prepared by mixing the powdered seeds with four times their weight of lard, or an infusion of the bruised seeds in vinegar, may be used for this purpose. Delphinia has been recently employed by Dr. Turnbull, of London, in rheumatic and neuralgic affections. The dose of it is from $\frac{1}{12}$ to $\frac{1}{4}$ of a grain, frequently repeated.

In cases of poisoning with stavesacre or its alkaloid, the treatment is the same as in poisoning with colchicum. (See page 95.)

Sulphur (described in the division *Cathartics*), in small doses frequently repeated, acts as a stimulant to the cutaneous vessels, and is therefore administered with much benefit in chronic diseases of the skin, particularly scabies, for which, however, it is more generally employed as an external application. The curative powers of sulphur in this disease appear to be specific, but it has been recently stated that it acts as a poison to a small insect (*Sarcoptes hominis* of Raspail) which has been discovered to exist in the pustules of itch, and by which it is believed by many that the disease is produced. Whatever may be its *modus operandi*, sulphur is undoubtedly more generally successful in the cure of scabies than any other substance which has been hitherto employed. Sulphur is also used as an external application in many other cutaneous eruptions, particularly in lepra and psoriasis, in which, in the form of vapour, *sulphur vapour-bath*, its use is productive of the best results. The dose of sulphur as a stimulant is from gr. x. to gr. xxx.; it may be given in the form of electuary made with treacle or with sirup. For external application, either of the following ointments may be used: *Unguentum Sulphuris*, D. L. E. ("Prepared lard, ℔iv. (℥iv., E.); sulphur, ℔j. (℥j., E.); rub the sulphur to fine powder, and mix well with the lard," D. E. "Sulphur, ℥iij.; lard, ℔ss.; oil of bergamot, min. xx.; mix," L.)—*Unguentum Sulphuris comp.*, L. (Sulphur, ℔ss.; white hellebore, powdered, ℥ij.; nitrate of potash, ℥i.; soft soap, ℔ss.; lard, ℔iss.; oil of bergamot, min. xxx.; mix.) This latter ointment often proves very irritating.

Terebinthinæ oleum.—*Oil of turpentine* (described in the division *Anthelmintics*), administered in small but frequently-repeated doses, acts as a general stimulant to the system, and as such has been employed in the low stages of typhoid and common continued fevers, in chronic rheumatism, in neuralgia, and in hemorrhages from the mucous surfaces dependant on an atonic state of the vessels. Its local stimulant powers have been already considered (see page 207); but made into an ointment with three parts of pre-

pared lard, it is one of the most useful applications that can be applied to the scalp in those forms of impetigo and eczema which admit of the use of stimulant applications. The four following substances, nearly allied to turpentine, and obtained from the same or nearly-related coniferous trees, are employed as topical stimulants, in the forms of ointments, plasters, or cerates.

Resina, L. E. Pinus sylvestris, resina, D. *The residue of turpentine after the oil is distilled*, L. *Residue of the distillation of the turpentines from various species of Pinus and Abies*, E. *Resin of Pinus sylvestris*, D.—Rosin, or Resin, is met with in two forms, *Yellow resin* (*Resina flava*), and *Brown resin*, or *Colophony* (*Resina nigra seu Colophonium*). The former is obtained when the application of heat is stopped before all the volatile oil is expelled from the pine turpentines; the latter, when the process is continued until all the oil is distilled. Resin is a semi-transparent, very brittle solid, varying in colour from pale yellow to brownish-black. It has a faint turpentine odour, but is quite tasteless; it consists of two resins, which have been named *Pinic* and *Sylvic acids;* the composition of both is the same, viz., $C^{40}H^{30}O^4$. In medicine, yellow resin is alone employed; it is used partly as a local stimulant, but principally to communicate a certain degree of consistence or adhesiveness to ointments, plasters, &c.—*Unguentum Resinæ Albæ*, D. (Yellow wax, ℔j.; white resin, ℔ij.; prepared hog's lard, ℔iv.; make an ointment, and strain through a sieve while hot.)—*Ceratum Resinæ*, L. (Resin and wax, of each, ℔j.; olive oil, fʒxvi.; melt the resin and wax together with a slow fire, then add the oil, and press the cerate while hot through a linen cloth.)—*Unguentum Resinosum*, E. (Resin, ʒv.; axunge, ʒviij.; bees' wax, ʒij.; melt them together with a gentle heat, and then stir the mixture briskly while it cools and concretes.) Those ointments, commonly known under the name of *Basilicon Ointment*, are employed as stimulating applications to foul and indolent ulcers.

Pix liquida, D. L. E. *Tar. From various species of Pinus*, D., *and of Abies*, E. *Prepared liquid resin of Pinus sylvestris*, L. —Tar is prepared in the countries bordering on the Gulf of Bothnia, from various trees of the fir tribe, by a species of *distillatio per descensum.* The old wood and roots are closely packed into the upper part of a pit dug in the earth, in the bottom of which an iron pan is fixed; the timber is ignited and covered with sods of earth, to prevent the escape of the volatile parts. The tar gradually exudes and flows into the iron pan, from whence it is conducted by a pipe into barrels, each of which holds 31½ gallons. It is a thick, tenacious, opaque liquid, of a dark-brown, almost black colour, with a strong, peculiar odour, and a bitter, disagreeable taste. It is composed of various resins, modified oil of turpentine, acetic acid, and water; it communicates both odour and taste to water, which dissolves out its oil and acid; and it is soluble in alcohol, ether, and the fixed and volatile oils. Tar was formerly used in medicine in chronic catarrhal complaints, and in the form of vapour its inhalation was highly recommended by Sir Alexander Crichton in phthisis.

In the present day, however, it is only used as a local stimulant in chronic cutaneous diseases, especially those which affect the scalp. —*Aqua picis liquidæ*, D. (Tar, *by measure*, ℔ij.; water, cong. j.; mix, stirring with a stick for a quarter of an hour; as soon as the tar has subsided, strain the liquor, and keep it in well-closed jars.) *Tar-water* was first introduced by Bishop Berkley, as a remedy for diseases of the chest and of the kidneys; the dose was from Oj. to Oij., daily.—*Unguentum picis liquidæ*, D. L. E. (Tar and mutton suet, of each, ℔ss. (℔j., L.); melt them together, and "strain through a sieve," D.; "press through a linen cloth," L. "Tar, ʒv.; bees' wax, ʒij.; melt the wax with a gentle heat, add the tar, and stir the mixture briskly, as it concretes on cooling," E.) Tar ointment is often used with much benefit as a stimulant in chronic diseases of the scalp in children.

Pix nigra, L. Pix arida, E. *The prepared solid resin of Pinus sylvestris*, L. *Pitch from various species of Pinus and Abies*, E.—This is a black, solid matter left after the oil; the acid and water are expelled by heat from tar. It is only used externally, the ointment being employed for the same purposes as tar ointment.—*Unguentum picis nigræ*, L. (Black pitch, wax, and resin, of each, ʒix.; olive oil, fʒxvj.; melt them together, and press through a linen cloth.)

Pix Burgundica, D. E. Pix abietina, L. *The* (*prepared*, L.) *resin of Pinus Abies*, D. L. *Concrete resinous exudation, probably in a great measure from Abies excelsa*, E. *Burgundy Pitch.*—This substance is supposed by the London and Dublin Colleges to be procured by fusion and expression from common frankincense, *Thus*, D. (*Abietis Resina*, L.), but as met with in the shops it is usually a mixture of common turpentine, resin, and palm oil. It is in soft masses of a pale yellow colour, with a terebinthinate odour and taste. It is only used externally, as a topical stimulant.—*Emplastrum picis*, L. E. ("Burgundy pitch, ℔ij.; resin of the spruce fir, ℔j.; resin and wax, of each, ʒiv.; expressed oil of nutmegs, ʒi.; olive oil and water, of each, fʒij.; add first the resin of the spruce fir, then the oil of nutmegs, the olive oil, and the water, to the pitch, resin, and wax melted together. Lastly, mix them all, and boil down to a proper consistence," L. "Burgundy pitch, ℔iss.; resin and bees' wax, of each, ʒij.; oil of mace, ʒss.; olive oil, fʒi.; water, fʒi.; liquefy the pitch, resin, and wax with a gentle heat, add the other articles, mix them well together, and boil till the mixture acquires the proper consistence," E. A stimulating plaster, applied to the chest in chronic catarrhal complaints, and over the seat of the pain in local neuralgia and in chronic rheumatism.

Veratrum album.—*White Hellebore* (described in the division *Errhines*) is a powerful stimulant, causing irritation, and even inflammation of the stomach, when taken in not very large doses. It was at one time much used in nervous affections, and in chronic cutaneous diseases, both externally and internally; its employment in gout has been replaced by colchicum, and its application for the

destruction of pediculi by stavesacre; so that at present it is scarcely ever put to any use; the dose of the powder is from gr. ij. to gr. v., cautiously increased.—*Vinum Veratri*, L. (White hellebore, sliced, ʒviij.; sherry wine, Oij.; macerate for 14 days, and strain.) Dose, min. v. to min. x.—*Decoctum Veratri*, D. L. (White hellebore, bruised, ʒj. (ʒx., L.); water (distilled, L.), *by measure*, ℔ij. (Oj., L.); rectified spirit, fʒij. (fʒiij., L.); boil the hellebore in the water down to ℔j. *by measure* (Oj., L.), and when it has cooled add the spirit; "then press and strain," L.) Only employed externally in chronic cutaneous diseases, particularly those of the scalp, and to destroy pediculi.—*Unguentum Veratri*, D. L. (White hellebore, powdered, ʒiij. (ʒij., L.); prepared lard, ℔j. (℔ss., L.); (oil of lemons, min. xx., L.); make into an ointment.) Used for the same purposes as the decoction. In poisoning with white hellebore, the same treatment should be used as in poisoning with colchicum. (See page 98.)

Vinum album Hispanum, D. Vinum xericum, L. Vinum album, E. *Spanish white wine. Sherry.*—It would be quite foreign to the scope of this work to enter into any detailed account of the mode of preparation or peculiar properties of the almost innumerable varieties of wine that are met with. The observations to be made will, therefore, refer to wines generally.

P. & C. P.—Wine is a transparent liquid, of a yellowish, reddish-yellow, or deep-red colour. It has a peculiar, agreeable odour (*bouquet*) and taste (both odour and taste vary exceedingly). It consists of water, alcohol, tartaric and acetic acids, bitartrate of potash, tartrate of lime, extractive matter, colouring matter, vegeto-animal matter, and a peculiar volatile oil, or, rather, ether, which has been named œnanthic ether. In the white wines, tannin and colouring matter are in less proportion than in the red wines. The quantity of alcohol which is present in wine varies exceedingly, some of the weaker German wines containing only 6·90 per cent. by weight of alcohol, while strong Port wine contains 17·10 per cent. (Christison).

Adulterations.—The only adulterations of wine which are of importance with reference to its medicinal employment are the additions of lead or of lime, which are sometimes used for the purpose of correcting acescency. The former is detected by the black precipitate which is produced on the addition of sulphuretted hydrogen; the latter, by the white precipitate formed with solution of oxalate of ammonia.

Th. E.—Wine is an excellant stimulant in the advanced stages of typhoid fevers, being generally better suited for this purpose than any other alcoholic liquid. Its use is particularly called for where delirium is present with much sinking of the vital powers, and when the nervous symptoms, as singultus, subsultus tendinum, and sleeplessness, unaccompanied with any local inflammation or congestion, predominate. The use of wine in fever is not contra-indicated, as has been stated by many, when the tongue is dry, black, or red,

when the eyes are red or suffused, or when there is morbid heat of the surface, as wine often proves of great benefit when one or even more of these symptoms are present. Wine is also given with much advantage in convalescence from acute diseases, in chronic debility, especially when it is caused by excessive discharges, in mortification unaccompanied with inflammatory symptoms, and in tetanus. When any local congestion or inflammation is present or may be apprehended, the administration of wine in the treatment of disease is for the most part calculated to do mischief. Although Sherry is the only wine officinal in the pharmacopœias, Port is generally employed in medicine; Claret and Madeira are also used. When its greater strength and its astringency are not objectionable, Port wine is always to be preferred. Madeira and Claret are often inadmissible, on account of their acidity; but when this is not the case, the former is well adapted for debilitated or broken-down habits; the latter when the employment of stronger wines might prove injurious. Sherry is chiefly employed in pharmacy for the preparation of the medicated wines, but Cape wine is usually substituted by the druggists, on account of its cheapness; in a dietetical point of view, Sherry is the wine in most general use, and the one calculated to agree best with most constitutions.

D. & M. of Adm.—The quantity of wine which should be administered in the treatment of disease varies so exceedingly in different cases, that it is almost impossible to lay down any general rule. From f℥viij. to f℥xx. is the quantity usually given in the 24 hours, and it should be borne in mind that there is a great tolerance of wine in disease. As an injection for the radical cure of hydrocele, two thirds of Port wine are diluted with one third of water.

Zingiber, D. L. E. *Ginger. Root of Amomum Zingiber*, D. *Rhizome of Zingiber officinale*, L. E.—Supposed to be originally a native of the East Indies, at present cultivated in most tropical countries. It belongs to the natural family *Zingiberaceæ*, and to the Linnæan class and order *Monandria Monogynia.*

B. C.—Stem annual, two to three feet high, cylindrical, invested with the smooth sheaths of the leaves; leaves linear-lanceolate, smooth; flowers yellowish, with purple lips, in cone-shaped, radical, or rarely terminal, solitary spikes; fruit, a 3-celled capsule.

P. U. & M. of Prep.—The rhizome or rootstalk, which is biennial, is dug up at the commencement of the second year of its growth, cleaned, scalded with boiling water, and dried in the sun, when it constitutes what is called black ginger; to prepare white ginger, the rhizome is not scalded, but the outer coats are removed by scraping.

P. P.—As met with in commerce, ginger is in various-sized, flattened pieces, knotty, palmated, hard, and compact. *Black ginger* is of a dirty gray colour, and rugose externally, yellowish brown and stringy within. *White ginger* is whitish or pale yellow externally, pale buff within, with a somewhat starchy texture. The finer qualities of ginger are firm, sound, and heavy, and have a peculiar, rich, aromatic odour, and a warm, very pungent taste.

C. P.—Ginger contains a pale yellow volatile oil, an acrid, soft resin, a sub-resin, gum, starch, extractive, nitrogenous matter, &c. Its properties, which depend chiefly on the volatile oil and soft resin, are extracted by water and by alcohol.

Th. E.—Ginger is a powerful aromatic stimulant; when taken in moderation, it increases remarkably the tone of the digestive organs, and, consequently, is much employed as a condiment. In medicine it is principally used to give warmth and flavour to other drugs. Ginger acts as a special stimulant to the urino-genital mucous membrane; its use should, therefore, be avoided by persons who have any tendency to stricture of the urethra. As a local stimulant, it is chewed in paralysis of the tongue, relaxation of the uvula, &c.; the powder, made into a paste with boiling water and spread on linen, is a speedy rubefacient.

D. & M. of Adm.—In powder, gr. v. to gr. xxx.—*Sirupus Zingiberis*, D. L. E. (Ginger, bruised (sliced, L.), ʒiv. (ʒiiss., L. E.); boiling water, *by measure*, ℔ iij. (Oj., L. E.); pure sugar, ʒlxxxvij. (℔iiss., L. E.); macerate (infuse, E.) the ginger in the water for 24 (4, L. E.) hours, strain, add the sugar, and make into a sirup.) Dose, fʒi. to fʒss. The sirup may be prepared extemporaneously by adding fʒi. of the tincture to fʒx. of simple sirup.—*Tinctura Zingiberis*, D. L. E. (Ginger, in coarse powder (sliced, L.), ʒiiss.; rectified spirit, *by measure*, ℔ ij. (Oij., L. E.); macerate for 7 (14, L.) days, and filter. "Proceed by percolation or digestion as for tincture of cinchona," E.) Dose, fʒi. to fʒij.—*Essence of Ginger*, commonly kept in the shops, is nothing more than a very strong tincture.

CHAPTER XX.

SPECIAL STIMULANTS.

In this division of medicinal agents, I include those substances which, by a *special* or peculiar action on individual organs, or on the system generally, produce remediate effects. Many of them give rise to some alteration in the nature or quality of vital action, not well understood, when they are called *alteratives;* while others possess a special influence in the treatment of certain diseases, when they are denominated *specifics*. Both alteratives and specifics are found in most of the other classes of medicines, but the articles contained in this chapter cannot, with a regard to accuracy in arrangement, be included in any of them, inasmuch as the nature of the primary influence which some of them exercise on the animal economy has not been satisfactorily ascertained, and others possess a peculiar influence over certain organs or diseases merely. As examples of the former, we may refer to Mercury, Iodine, and Gold; of the latter, to Nux-vomica, Cubebs, and Copaiba.

[In this class of special stimulants the author designs to include all those articles which have been denominated *alteratives* in the modern technology, and yet it must be obvious that their *special* action is in most cases hypothetical, and their *stimulating* nature often merely supposititious, if not contra-indicated by their effects. Hence it is not easy to discover the appropriateness of his designation. For example, what *special* or topical effects are produced by calomel, arsenic, bromine, iodine, and gold? Certainly none which are not the result and proof of their *general* impression upon the constitution; and why, then, should they be called "specifics," in the sense of "special stimulants?" Indeed, it is more than doubtful whether "Nux-vomica, Cubebs, and Copaiba," the examples he cites as specifics, can be shown by any species of medical logic to "possess any peculiar influence over certain organs or diseases merely," except so far as this special influence is consequential upon the constitutional impression primarily made by them severally.

For these, among other reasons, the profession will be slow to relinquish the term *alteratives* as the characteristic designation of this class of remedies, and they will not readily subscribe to the doctrine of "specifics," which the author's new name "special stimulants" distinctly recognises. Indeed, the stimulating nature of some of them admits of very equivocal proof, if in any case it can be demonstrated.

But the same objections do not lie to the term *alterative*, by which is understood those remedies which very gradually *change* or alter the functions, secretions, &c., thus re-establishing the healthy action, primarily of the digestive system, and secondarily of the vital functions generally. The convenience of the nomenclature of the author is more apparent than its scientific accuracy.]

Arsenici iodidum. *Iodide of Arsenic. Teriodide of Arsenic*

P. & C. P.—This is an orange-red powder, odourless and tasteless. Exposed to the air, it decomposes rapidly, iodine escaping, and metallic arsenic being left; it is volatilized by heat. It is decomposed by water into free iodine, hydriodic and arsenious acids. Its composition is $As I^3$.

Prep.—Arsenic, 3 parts; iodine, 10 parts; water, 100 parts; digest together so long as the odour of iodine is perceived, and evaporate quickly to dryness.

Adulterations.—As met with in the shops, this preparation frequently contains uncombined metallic arsenic, which may be distinguished by the naked eye.

Th. E.—Iodide of arsenic is employed internally with much benefit in the treatment of chronic cutaneous diseases, particularly lepra and psoriasis; in the latter of which I have used it extensively, and with great success, even in very inveterate cases, after many other remedies had been tried in vain. Its use must be continued for some time after the disease is cured, in order to prevent a relapse. In some cases in which the medicine had been taken daily for five or six weeks, the patients complained of headache

and dryness of the mouth and fauces, which quickly disappeared on intermitting the use of the remedy for a few days. On the Continent it has been also employed as a topical application in the form of ointment, but its external use is not unattended with danger.

D. & M. of Adm.—It should be at first given in doses of $\frac{1}{10}$ of a grain, which may be cautiously increased to $\frac{1}{4}$ of a grain three times a day. It is best administered in the form of pill made with conserve of roses, or with hard manna.

Incomp.—Acids; acidulous and metallic salts.

Arsenici et hydrargyri hydriodatis liquor, Donovan. *Liquor of Hydriodate of Arsenic and Mercury.*—This solution is of a pale greenish-yellow colour, odourless, with a rather styptic taste. Each ℥i. contains $\frac{1}{8}$ of a grain of oxyde of arsenic, $\frac{1}{4}$ of a grain of oxyde of mercury, and $\frac{1}{5}$ of a grain of iodine in chemical combination.

Prep.—"Triturate 6·08 grains of finely-levigated metallic arsenic, 15·38 grains of mercury, and 49·62 grains of iodine with f℥i. of alcohol, until the mass has become dry, and, from being deep brown, has become pale red. Pour on f℥viij. of distilled water, and after trituration for a few moments, transfer the whole to a flask; add ℥ss. of hydriodic acid, prepared by the acidification of gr. ij. of iodine, and boil for a few moments. When the solution is cold, if there be any deficiency of the original f℥viij., make it up exactly to that measure with distilled water. Finally, filter," Donovan.

Th. E.—This compound has been found particularly useful in the treatment of chronic cutaneous diseases, especially those of a scaly character, or in which the scalp is the seat of the disease. It has been also employed with benefit in venereal eruptions, both papular and scaly, in lupus, in impetigo, in pityriasis, &c. Its efficacy in those obstinate affections is now well established, and there are few cases, even of the most chronic character, which will resist its steady administration. For farther information on this subject, I must refer to Mr. Donovan's excellent memoirs in the *Dublin Journal of Medical Science.*

D. & M. of Adm.—Min. x. to min. xxx., three times a day. It should be administered properly diluted with distilled water. The external use of the medicine in the form of lotion (f℥i. to f℥i. of distilled water) is advantageously combined with its internal use.

Incomp.—Acids; most salts; opium; and the salts of morphia.

Aurum. *Gold.*—This metal is not contained in any of the British Pharmacopœias, nor are any of its preparations employed in Great Britain in the practice of medicine. They are, however, frequently administered on the Continent, and their virtues in some diseases highly spoken of. Although it has been stated by many that metallic gold is perfectly inert, a powder of gold (*Pulvis auri*) is officinal in the Parisian Codex. It is prepared in several ways: one of the simplest and best is to rub any quantity of leaf-gold with 7 or 8 times its weight of sulphate of potash in an earthenware or glass mortar as long as any fragments of the leaves are visible; washing well with warm water, which dissolves out the sulphate of potash, and leaves the gold in the form of a fine powder. Pow-

der of gold is said to be a much more effectual remedy, both in primary and secondary syphilis, than mercury; it will in some instances produce increased flow of saliva, without, however, affecting the teeth and gums as that metal does. It has also been used in chronic cutaneous diseases, in scrofulous affections, and in glandular enlargements. Powder of gold may be given internally in doses of gr. $\frac{1}{4}$ or gr. $\frac{1}{2}$, gradually increased to gr. iij.; it may be made into pill with conserve of roses. It is, however, generally introduced into the system by way of friction on the gums and tongue, or applied on a portion of the skin, deprived of the epidermis. For this purpose either of the following preparations may be used: *Sirup of Gold.* (Powder of gold, gr. xxiv.; simple sirup, f℥i.; mix.) —*Ointment of Gold.* (Powder of gold, gr. j.; axunge, gr. xxxvj.)

AURI IODIDUM. *Iodide of Gold.*

PREP.—(Fr. Cod.) "Pour a solution of chloride of gold into a solution of hydriodate of potash, as long as any precipitate falls; filter, and wash the powder well with alcohol, to dissolve out the excess of iodine."

P. & C. P.—Iodide of gold is a greenish-yellow powder, insoluble in cold, and very sparingly soluble in boiling water. Exposed to a heat of about 300° F., the iodine is driven off, and metallic gold left. It is composed of 2 eq. of gold and 1 of iodine, Au^2I (Graham.)

TH. E.—This preparation is a very active poison, more so than corrosive sublimate; it is employed in venereal and scrofulous affections internally, in doses of $\frac{1}{15}$ to $\frac{1}{10}$ of a grain, in the form of powder, or of pill combined with powdered gum-arabic, as it is decomposed by most vegetable substances.

AURI PERCHLORIDUM. *Perchloride of Gold. Sesquichloride of Gold.*

PREP.—(Fr. Cod.) "Dissolve one part of pure laminated gold in four parts of nitro-hydrochloric acid; evaporate with a gentle heat till the solution begins to emit chlorine; and set it aside to crystallize by cooling."

P. & C. P.—Sesquichloride of gold is in the form of needle-shaped, prismatic crystals, of a golden-yellow colour; it is inodorous, but has a very styptic, disagreeable taste. In dry air it remains unaltered, but deliquesces rapidly in damp air. Water, alcohol, and ether dissolve this salt; the solution is of a yellow colour, and is acid to litmus paper; exposed to the light, although kept in stoppered bottles, it is decomposed, and gold deposited on its surface. Sesquichloride of gold is composed of 2 eq. of gold and 3 of chlorine, Au^2Cl^3 (Graham).

TH. E.—This salt is the most generally employed of the preparations of gold. It is exceedingly active; so small a dose as $\frac{1}{15}$ of a grain has in the hands of Cullerier at the second dose produced gastric irritation, dryness of the tongue, redness of the throat, colic, and diarrhœa. It is employed, it is said with much success, in the treatment of syphilitic diseases, both primary and secondary, particularly in cases where mercurial preparations fail to do good. It

has also been used in scrofulous and herpetic affections, in cancer, &c. As an external application, it has been employed as a caustic to open cancer, to lupus, and to obstinate syphilitic ulcerations.

D. & M. OF ADM.—It may be given in doses of $\frac{1}{10}$ to $\frac{1}{15}$ of a grain, once a day, made into pills with starch, or dissolved in distilled water. The same quantity, intimately mixed with gr. v. of starch, may be applied by friction to the gums and tongue.—*Caustic of Recamier.* (Chloride of gold, gr. vj.; dilute nitro-hydrochloric acid, ʒi.; dissolve.) Applied by means of a piece of lint dipped in it; the eschar which it forms falls off in a few days, and leaves a clean, healthy surface underneath.—*Sodii Auro-terchloridum*, FR. COD. (Chloride of gold, 85 parts; chloride of sodium, 16 parts; dissolve in a small quantity of distilled water; concentrate with a gentle heat, till a pellicle begins to form on the surface; then set aside to crystallize.) Chloride of gold and sodium is employed in the same manner, and in the same doses, as sesquichloride of gold. It is less expensive, and nearly, if not quite as active. An ointment of it, prepared by rubbing $\frac{1}{10}$ of a grain with gr. xxxvj. of axunge, may be applied to the skin denuded of the epidermis.

INCOMP.—Most metals, and their salts; sugar; gum; charcoal; tannin; extractive.

In poisoning with chloride of gold, or with chloride of gold and sodium, the same treatment should be adopted as in poisoning with corrosive sublimate. (See page 339.)

AURI PEROXYDUM. *Peroxyde of Gold. Sesquioxyde of Gold. Auric Acid.*

PREP.—(Fr. Cod.) "Chloride of gold, 1 part; calcined magnesia, 4 parts; water, 40 parts; boil gently for a short time; wash the precipitate repeatedly with water; and then digest in cold diluted nitric acid, to dissolve out the magnesia; dry the residuum without heat."

P. & C. P.—Auric acid is of a chestnut-brown colour, becoming yellowish when moistened. It is insoluble in water, is rapidly decomposed by exposure to light or heat, and combines with alkalies to form salts. It is composed of 2 eq. of gold, and 3 of oxygen, Au^2O^3 (Graham).

TH. E.—It is used in the same cases as the other preparations of this metal. Dose, $\frac{1}{15}$ of a grain to $\frac{1}{4}$ of a grain.—*Pills of oxyde of Gold*, MAGENDIE. (Oxyde of gold, gr. vj.: extract of mezereon, ʒij.; divide into 60 pills.) Dose, ij. to x., daily.

BROMINEUM, L. *Bromine.*—This elementary fluid body has been introduced into the London Pharmacopœia for preparing the *Bromide of potassium.* It has been employed on the Continent in the same cases as iodine, than which it is said to be more active. It has not been hitherto used in Great Britain. One part of bromine dissolved in 40 parts of water, and the solution flavoured with some aromatic sirup, may be given in doses of five or six drops.

COPAIBA, L. E. COPAIFERA OFFICINALIS, RESINA LIQUIDA, D. *Co-*

paiva. Balsam of Copaiva. Fluid resinous exudation of various species of Copaifera, E.—*of Copaifera officinalis*, D.—*of Copaifera Langsdorfii*, L.—The various species of the genus Copaifera from which the balsam is obtained are natives of South America and the West India Islands; they belong to the natural family *Amyridaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

B. C.—Trees 20 to 35 feet high; leaves abruptly pinnate; leaflets coriaceous, somewhat unequal, ovate; flowers in panicles.

P. U. & M. or Prep.—The liquid resin exists in great abundance in the trees; it is procured by making deep incisions into the stem in the hot summer months, when in some instances 12 pounds of juice will exude in three hours. Many trees will yield copaiva twice or three times in the year.

P. P.—*Copaiva*, or, as it is commonly but improperly called, *Balsam of Copaiva*, is a transparent, oily liquid, of a pale-yellow colour (inferior kinds are dark yellow). It has a strong, peculiar, and to many persons very disagreeable odour, and a bitter, acrid, very permanent, and exceedingly unpleasant taste. Sp. gr., from ·950 to ·966, becoming denser by age.

C. P.—Fresh copaiva is composed of 41 per cent. of volatile oil, 51·38 per cent. of hard yellow resin (*copahuvic acid*), 2·18 of brown soft resin, and 5·44 of water and loss (Gerber). Exposed to the air, it gradually thickens, and becomes darker coloured. It is insoluble in water, but completely soluble in alcohol, ether, and the fixed and volatile oils. It dissolves magnesia and its carbonate, and forms with them, after 4 or 5 hours, a translucent mass, sufficiently consistent to form into pills. The volatile oil of copaiva (*copaibæ oleum*), which is officinal in the *Edin. Phar.*, is obtained by distillation with water. It is thin and colourless, has a density of 0·878, boils at 473°, and is soluble in alcohol and ether. Its composition is the same as that of oil of turpentine, C^5H^4. *Copahuvic acid* is composed of $C^{40}H^{32}O^4$; it is left when the volatile oil is distilled; in consequence of its retaining a small portion of which, it possesses a faint copaiva odour.

Adulterations.—Copaiva is very much adulterated, so much so that it is difficult to meet with a perfectly pure specimen. The impurities usually found in it are oil of turpentine, or some fixed oil, as castor oil, poppy-seed oil, rape oil, &c. Oil of turpentine is readily discovered by the odour, when it is dropped on a heated spatula. The presence of any fixed oil may be detected by the greasy areola which surrounds the spot of resin left, on gently evaporating over the flame of a lamp a drop or two of the suspected balsam on unsized paper. The tests of the *Edin. Phar.* for its purity are as follows: "Transparent; free of turpentine odour when heated; soluble in two parts of alcohol: it dissolves a fourth of its weight of carbonate of magnesia with the aid of a gentle heat, and continues translucent." To these we may add the most satisfactory test for the usual adulteration, that with castor oil, as proposed by Planche: "Pure balsam agitated with solution of ammonia, of the density ·965, becomes clear and transparent in a few moments, but remains turbid if castor oil be present."

Th. E.—Copaiva is a special stimulant to the mucous membranes, its action being particularly directed to the bladder and urethra. In many instances its administration is followed by a cutaneous eruption, which closely resembles urticaria; and, when given in large doses, it produces vomiting and purging. The principal use of copaiva is in the treatment of gonorrhœa, for which it is undoubtedly the best remedy with which we are acquainted. The practice is still followed by many of not administering copaiva in this disease until all inflammatory symptoms are subdued by antiphlogistic treatment. But the majority of surgeons in the present day administer it in the very earliest stage, and with the best results; indeed, the earlier it is given, the more speedy and the more effectual will be the cure. In the treatment of gonorrhœa, the use of copaiva should be always continued for 8 or 10 days after the discharge has completely ceased. Copaiva has been also employed with benefit in leucorrhœa, in chronic catarrh of the bladder, in the chronic bronchitis of the old or debilitated, especially when the bronchial secretion is profuse, and in chronic dysentery.

D. & M. of Adm.—Min. x. to ʒi. In consequence of its very nauseous taste, a great many ways have been proposed for administering copaiva; but it appears to me to act with greater certainty, and to cause less disgust, when given floating on a wine-glassful of water, to which a drachm of some aromatic tincture, as tincture of orange peel, has been added. It is sometimes given in the form of pill, prepared by boiling the balsam with calcined magnesia or with hydrate of lime; a sufficient degree of consistency will be obtained in 4 or 5 hours with the latter, while from 12 to 15 hours will be required to produce the same result with the former. The process of M. Thierry is as follows: Rub together in a marble mortar 15 parts of *pure* copaiva, and 1 part of hydrate of lime (or 2 parts of calcined magnesia); put the mixture over a water-bath, and stir from time to time till the lime has disappeared; keep up the fire for 4 hours, or for 15 hours if magnesia be used. The mass may be divided into gr. vj. pills, of which from 6 to 12 may be taken two or three times daily. More recently copaiva has been administered enclosed in gelatine capsules, for preparing which the following method is followed: the polished bulbous extremities of iron rods are oiled with almond oil, and then dipped into a warm concentrated aqueous solution of ordinary or bleached gelatine, which is of the consistence of thick honey; it is then rotated quickly till the gelatine congeals, when the capsules are to be removed gently with three fingers, and laid on a loose hair-sieve to dry; when perfectly dry, they are filled to the margin by means of a glass drop tube with copaiva, and the mouths closed with the warm solution of gelatine (Steege). *Gelatine capsules of copaiva* contain each about gr. x. of balsam. The nostrum known as *Frank's specific solution* may be very closely imitated as follows: Copaiva, 2 parts; liquor potassæ, 3 parts; distilled water, 7 parts; boil for a quarter of an hour, then add spirit of nitric ether, 1 part; allow it to stand a few hours, and draw off the clear liquid by means of an

orifice in the lower part of the vessel. The dose of this mixture is f℥ij. three times a day.—*Oleum Copaibæ*, E. The oil is preferred by many to any other preparation of copaiva, but I have frequently seen it fail; the dose is from min. xv. to min. xxx., dropped on sugar.—*Resina Copaibæ.* This preparation is very properly almost entirely discarded from practice; the dose of it is from gr. x. to ʒss.

Cubeba, D. E. Piper cubeba, L. *Cubebs. Fruit of Piper Cubeba.*—A native of Java and Prince of Wales's Island, belonging to the natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

B. C.—Stem sarmentaceous, articulated, terete; leaves petiolated, oval, coriaceous; flowers on an elongated, pendent spadix; fruit a pedunculated small berry; the peduncles are nearly equal to the petiole.

P. P.—Cubebs are the dried unripe berries; they are about the size of black pepper, wrinkled on the surface, brownish externally, whitish and oily within. They have a small portion of the peduncle attached, whence the name *Piper caudatum* has been applied to them. Their odour is strong, peculiarly aromatic; their taste warm, pungent, and very spicy.

C. P.—Cubebs are composed of 2·5 per cent. of green volatile oil, 1 per cent. of yellow volatile oil, 4·5 of a peculiar principle named *Cubebin* (which is probably identical with *Piperin*), 1·5 of balsamic resin, and wax, lignin, &c. The volatile oil, *Oleum Cubebæ*, E., is obtained by the usual process of distillation with water; it is of a pale greenish-yellow colour, transparent and limpid, with the peculiar odour and taste of cubebs. Its density is 0·929, and its composition $C^{15}H^{12}$. Cubebs yield their properties very partially to boiling water, but completely to alcohol.

Th. E.—Cubebs possess the stimulant and carminative properties of the other peppers; but they also exercise a specific influence on the urinary organs, indicated by their power in arresting urethral discharges. They are only employed in medicine in the treatment of gonorrhœa, for which they are held by many to be equal, if not superior, to copaiva. We are perfectly ignorant as to the manner in which cubebs cure gonorrhœa; but their specific influence appears to be exercised only in the early stages of the disease, so that they usually fail to prove beneficial when the discharge has existed for any time; they should, therefore, be administered on its first appearance, when, if the running is not checked in from three to five days, their continued use will in most instances do more harm than good. Cubebs have been also employed in leucorrhœa and in catarrh of the bladder with doubtful benefit.

D. & M. of Adm.—In powder, which is the best form, ℈j. to ʒiij. three times a day. The powder should be always prepared fresh for use, as, owing to the volatility of its oil, it deteriorates rapidly. The larger the dose in which cubebs are given, the more certain will be their effect; they may be administered suspended in milk or in water.—*Oleum Cubebæ*, E. Dose, min. x. to min. xxx., drop-

ped on sugar; it is not so certain in its effects as the powder.—*Tinctura Cubebæ*, D. L. (Cubebs (bruised, L.), ℥iv. (℥v., L.); proof (rectified, L.) spirit, ℔ij. (Oij., L.); macerate for 14 days, and filter.) This tincture is generally added to mixtures containing copaiva. Dose. f℥i. to f℥ij.

Fucus vesiculosus, herba cum fructu, D. *Bladder Wrack.*—A very common sea-weed on our shores, belonging to the natural family *Algaceæ*, and to the Linnæan class and order *Cryptogamia Algæ*. This sea-weed contains *iodine*, and before the discovery of that substance, the expressed juice was given internally, and frictions of the plant applied externally in scrofulous and glandular enlargements.

Hydrargyrum, D. L. E. *Mercury. Quicksilver.*—Mercury is met with in the metallic state in the quicksilver mines of South America. It is principally brought to England from Almaden in Spain, and from Idria in Carniola, where it is extracted from the native sulphuret, *Cinnabar*.

Prep.—It is procured from cinnabar either by distilling with caustic lime or by roasting the ore. As met with in commerce, it is in general sufficiently pure for medical purposes, but in the *Dub. Phar.* a process is contained for purifying it: Hydrargyrum purificatum, D. "Mercury 6 parts; distil 4 parts with a gentle heat."

P. & C. P.—At ordinary temperatures, mercury is liquid; it has a silver-white colour, with a bluish shade, and is very brilliant. Its sp. gr. is 13·5 when liquid, and 14·0 when solid. It boils at 662°, and solidifies at 39° or 40° below zero, crystallizing in regular octohedrons; exposed to the air at the usual temperature, it remains unaltered if pure, but otherwise the surface soon tarnishes. Agitated for some time in contact with the air, it is converted into a grayish black powder, which was formerly called *Æthiops per se;* this, according to some chemists, is a suboxyde of mercury, but, according to others, it is the metal in a state of very minute division. Mercury combines with most metals to form *amalgams;* the smallest trace of it communicates a white stain to gold or silver.

Adulterations.—Tests for the purity of metallic mercury are given by the London and Edinburgh Colleges. "Totally dissipated in vapour by heat. Dissolved by diluted nitric acid; when boiled in hydrochloric acid, the acid, when cold, is not coloured, nor is anything precipitated from it by hydro-sulphuric acid. Its sp. gr. is 13·5," L. "Entirely sublimed by heat; a globule moved along a sheet of paper leaves no trail; pure sulphuric acid agitated with it evaporates when heated, without leaving any residuum," E. By the application of those tests, the usual metallic adulterations with tin, lead, zinc, or bismuth, are readily detected.

Th. E.—As long as mercury remains in the state of metal, it is now generally agreed that it does not exercise any influence on the human body, and that, in all cases in which its specific action is manifested, it must be first converted into oxydes or salts. The inhalation of mercurial vapours (which, as has been recently proved,

contain some oxyde) for any lengthened period produces a singular train of symptoms, which principally affect the nervous system; the most remarkable of these is the *shaking palsy*, or *tremblement metallique*, in which the muscles of the arms become so unsteady as almost to place them completely out of the control of the individual. This affection is not uncommon among the workers in quicksilver mines, gilders, and others whose trade exposes them to the vapour of this metal. The effects of the mercurial compounds on the human body are very complex, and, as they are possessed in common by most of the preparations employed in medicine, they will be most conveniently considered here.

The *topical* effects of the preparations of mercury are generally somewhat irritant; *remotely* they act as special stimulants both to secretion and excretion. The most remarkable effect of mercury is its action on the salivary glands, *salivation*. When this medicine is introduced into the system in such a manner as to excite this peculiar state, at first it produces increased vascular action, shortly followed by a metallic or brassy taste in the mouth, and a slight mercurial fœtor of the breath; the gums become somewhat swollen and spongy at their edges, soon presenting a slight degree of ulceration; the lining membrane of the cheeks, and sometimes also of the palate, acquires a leaden hue, and is swollen; and an increased flow of saliva takes place, accompanied with pain in the teeth on the least pressure. If those symptoms be allowed to advance, or if more mercury be administered, the cheeks, the tongue, and the throat swell and ulcerate, and a copious flow of saliva, sometimes amounting to several pints in the twenty four hours, is induced; this excessive salivation is accompanied with slow fever and rapid emaciation. The quantity of mercurial preparation required, or the length of time for which it must be administered to produce the above effects, varies exceedingly in different constitutions and under different circumstances. Individuals are sometimes met with in whom almost the minutest dose of any preparation of mercury will produce most violent salivation; while, on the other hand, some persons appear to be totally insensible to the operation of the drug.

It has been held by many that the production of this specific effect of mercury is necessary to the development of its curative powers, and most unquestionably it occurs that its sanatory influence in the treatment of most diseases is contemporaneous with its action on the salivary glands. Great attention must, however, be always paid not to allow salivation to proceed too far, as a frightful train of symptoms, in many instances followed by death itself, is the usual result of excessive salivation. In the early stage, mercurialism is most decidedly checked by the use of active or nauseating doses of tartar emetic, and by keeping the surface of the body warm, and the face and neck cool. The effects of mercury on the system are sometimes accompanied with a peculiarly alarming state, first described by Mr. Pearson, under the name of *mercurial erethism*; "it is characterized by great depression of strength, a sense of anxiety about the præcordia, frequent sighing, trembling

partial or universal, a small, quick, and sometimes intermitting pulse, occasional vomiting, a pale, contracted countenance, a sense of coldness, but the tongue is seldom furred, nor are the vital or natural functions much disordered." When these or the greater part of these symptoms are present, a sudden and violent exertion of the animal powers, such as rising suddenly in bed, will often prove fatal. These symptoms are best combated by an immediate discontinuance in the use of mercury, the exhibition of cordials in small but frequent doses, and rest in the horizontal posture, with free exposure to the open air, both by day and night. The use of this mineral is also frequently attended with, or followed by, several forms of diseases of the skin; of these the most important is *mercurial eczema*, which often occurs when only a very small quantity of a mercurial preparation has been taken. In its milder forms, it resembles the acute stage of *eczema rubrum*, arising from other causes; but it more frequently assumes a much more severe character, when it is ushered in by fever, difficult respiration, dry cough, and tightness across the chest, with a general smarting and burning feel of the skin over the whole body. These symptoms are soon followed by an eruption of minute vesicles, which break and discharge a very fetid fluid. As the disease increases in severity, the eruption extends over the face and the whole of the body, which become covered with incrustations; the fever assumes a typhoid type, the difficulty of breathing increases, and is accompanied with bloody expectoration, spots of purpura appear, and death ensues, preceded by delirium or convulsions. On the first appearance of this eruption, the use of mercury ought to be immediately relinquished, and the accompanying symptoms treated by the means appropriate for the individual case, any account of which would be quite foreign to the scope of this work.

The therapeutical powers of mercury, and for which it is employed in the treatment of disease, depend on its properties as an *antiphlogistic*, an *antisyphilitic*, an *alterative*, and a *deobstruent*. An account of the most important diseases for which mercurials are administered is subjoined, but, as they are so numerous, they can only be very shortly alluded to. In *inflammatory diseases*, both acute and chronic, mercury is very much employed; it is peculiarly adapted for those forms of inflammation which frequently result in the effusion of coagulable lymph or of serum; among which may be enumerated croup, laryngitis, bronchitis, pleuritis, pericarditis, peritonitis (particularly that form of it which attacks lying-in women), meningitis, &c. In all those diseases the previous use of bloodletting is attended with advantage, and the mercurial (calomel is the preparation generally used) should be introduced into the system as quickly as possible, so as just to touch the gums, but the production of free salivation usually proves injurious. In iritis, mercury is the chief remedy on which reliance is to be placed. In hepatitis, in pneumonia, in metritis, and in synovitis, its use is productive of decided benefit. In epidemic dysentery, and in pestilential cholera, especially when occurring in warm climates, very

large doses of calomel, given at the very onset of the disease, will frequently cut it short; as this power, however, is possessed by calomel alone, we shall again refer to it. In the fevers prevalent in Great Britain, unless when inflammation of some peculiar organ is present, the use of mercury is injudicious; but in the fevers of warm climates it is for the most part found to be serviceable. The curative powers of mercury in inflammatory diseases depend much on the character of the inflammation; thus, while it generally acts beneficially in simple acute inflammations, and in those of a syphilitic character, it is less serviceable in rheumatic, and seldom admissible in scrofulous inflammation.

The history of the *syphilitic disease* is closely connected with mercury, as for many hundred years it was supposed to be completely incurable without the use of that medicine. Of late, however, it has been established, on very satisfactory evidence, that most, if not all, cases of syphilis may be cured without mercury, by simple local and general treatment. Nevertheless, when judiciously employed, so as to produce a moderate ptyalism, mercury has been found, by the most experienced surgeons, to cure the disease more rapidly, and to afford greater security against relapses.

In chronic enlargements of the abdominal viscera unconnected with malignant disease, in glandular swellings, in morbid depositions, in adhesions of parts consequent on inflammation, and for the removal of effusions into any of the shut cavities of the body, mercury, administered so as to produce its specific action, generally proves very efficacious. In paralysis, especially when dependant on derangements of the brain and nervous system, its use is often attended with decided benefit. In many other diseases of the nervous system, as in hydrocephalus, in mania, in epilepsy, in chorea, in tetanus, in hysteria, in tic douloureux, &c., mercury has also been employed in many instances with advantage.

D. & M. of Adm.—To remove obstruction of the bowels, metallic mercury has been given in doses of one or two pounds, followed by active cathartics, but the absurdity of the principle on which it was administered, that of acting as a mechanical agent, is too manifest to require any observation. As before remarked, the specific action of mercury is not manifested as long as it retains the metallic state; but, as there are some general rules which apply equally to the different mercurial preparations employed to produce salivation, they will be most conveniently considered in this place. And, first, with respect to preparatory treatment, it will be always advisable, in acute inflammations, to subdue the severity of the symptoms by antiphlogistic measures; and in broken-down or enfeebled constitutions, to strengthen the system by the use of tonics, previous to the administration of mercury. Owing to the neglect of these precautions, it frequently occurs that the physician is baffled in his attempts to produce ptyalism, or, when produced, it is excessive, and with great difficulty controlled. "I am strongly of opinion," says Mr. Colles, in his valuable work on the Venereal Disease, "that the want of a due preparatory process has of late years

contributed to bring this valuable remedy into much disrepute." With respect to the general treatment during a mercurial course, the most important points to be observed are, the necessity of rest and quietness of both mind and body, the maintaining the temperature of the surface uniform by warm clothing, and the use of a moderate diet, free from all stimulating food and drink. In the following preparations, a portion of the mercury is converted into the sub-oxyde, but the greater part of it is merely mechanically reduced to a finely-divided state.—*Pilulæ Hydrargyri*, D. L. E. (See page 101.) Dose, gr. iij. to gr. v., night and morning; if it should occasion irritation, a fourth of a grain of opium may be added to each pill.—*Hydrargyrum cum Cretâ*, D. L. E. (See page 100) This is the mildest preparation of mercury; as an alterative, the dose is from gr. v. to gr. xxx. It is seldom given with the intention of producing salivation, except in very weak or enfeebled habits.—*Hydrargyrum cum Magnesiâ*, D. (See page 101)—*Unguentum Hydrargyri*, D. E. *Unguent. Hydrargyri fortius*, L. ("Purified mercury, prepared lard, of each, equal parts; rub them together in a marble or iron mortar until the globules of mercury disappear," D. "Mercury, ℔ij.; lard, ʒxxiij.; suet, ʒj.; triturate the mercury with the suet and a little of the lard till globules are no longer visible, then add the rest of the lard, and mix the whole thoroughly," L. E. "This ointment is not well prepared so long as metallic globules may be seen in it with a magnifier of four powers, E.)—*Unguentum Hydrargyri Mitius*, D. "Made with twice as much lard as the last," D. "Mix ℔j. of the stronger ointment of mercury with ℔ij. of lard," L. "The stronger ointment diluted with twice or thrice its weight of axunge," E. Mercurial ointment is very frequently employed for introducing mercury into the system; and for this purpose, ʒss. to ʒi. of the stronger ointment may be rubbed carefully into the inside of the thighs every morning. Should it be desirable to produce speedy salivation, it may be used as a dressing to blistered surfaces, and ʒj. or ʒij. placed in each axilla. When employed to promote the dispersion of glandular enlargements, it should be rubbed over the seat of the disease. The milder ointment is generally used as a dressing to venereal sores.—*Ceratum Hydrargyri comp.*, L. (Stronger ointment of mercury and soap cerate, of each, ʒiv.; camphor, ʒj.; rub together until they are incorporated.) Employed to promote the dispersion of indolent tumours, and as an application to chronic enlargements of the joints.—*Linimentum Hydrargyri comp.*, L. (Stronger mercurial ointment and lard, of each, ʒiv.; camphor, ʒi.; rectified spirit, fʒj.; solution of ammonia, fʒiv.; rub the camphor first with the spirit, then with the lard and ointment of mercury; lastly, the solution of ammonia being gradually poured in, mix them all.) A stimulating liniment, applied to indolent tumours, &c.; ʒj. contains nearly gr. x. of mercury. It produces salivation very speedily.—*Emplastrum Hydrargyri*, L. E. ("Mercury, ʒiij.; lead plaster, ℔j.; olive oil, fʒj.; sulphur, gr. viij.; add the sulphur gradually to the heated oil, stirring constantly with a spatula till they

unite; afterward rub the mercury with them until globules are no longer visible; then gradually add the plaster of lead melted with a slow fire, and mix them all," L. "Mercury, ʒiij.; litharge plaster, ʒvj.; olive oil, fʒix.; resin, ʒi.; melt the resin and oil, let them cool, add the mercury, triturate till the globules disappear, add the plaster, previously melted, and mix the whole well," E.) Applied as a resolvent in glandular enlargements, and over the region of the liver in chronic induration of that organ.—*Emplastrum Ammoniaci cum Hydrargyro*, D. L. E. ("Gum ammoniac, ℔j.; purified mercury, ʒiij.; common turpentine, ʒij.; rub the mercury with the turpentine till the globules disappear, then add gradually the ammoniac melted, and with a medium heat rub together until they incorporate," D. "Ammoniac, ℔j.; mercury, ʒiij.; olive oil, fʒi.; sulphur, gr. viij.; proceed as for *Emplastrum Hydrargyri*, L., substituting the ammoniac for the lead plaster," L. E.) Applied to indolent buboes, enlarged glands, especially when of a syphilitic origin, and to venereal nodes.

Hydrargyri acetas, D. *Acetate of Mercury.*

P. P.—This salt occurs in the form of thin crystalline scales of a pearly lustre. It is inodorous, but has an acrid, metallic taste.

C. P.—It is composed of 1 eq. of suboxyde of mercury, and 1 of acetic acid ($Hg^2O+C^4H^3O^3$). Exposed to light, it turns black, and is decomposed; heat expels its acetic acid, and if the temperature be increased, the mercury is volatilized. It requires for its solution 333 parts of cold water, but is much more soluble in boiling water, which, however, decomposes it into metallic mercury and acetate of the oxyde of mercury. It is insoluble in cold alcohol.

Prep.—*Dub.* "Purified mercury and acetate of potash, of each, 9 parts; dilute nitric acid, 11 parts; boiling distilled water, 100 parts; distilled vinegar, q. s.; add the nitric acid to the mercury, and the effervescence having ceased, digest the mixture until the metal is dissolved; dissolve the acetate of potash in the water, and add distilled vinegar until the acid predominates; to this, while boiling, add the mercury dissolved in the acid, and filter quickly through doubled linen; let it cool, that crystals may form; wash these with cold distilled water, and dry them on paper with a gentle heat. In the whole of this process, glass vessels must be used."

Th. E.—This is a mild preparation of mercury, but little used at present; it has, therefore, been omited from the London and Edinburgh Pharmacopœias. Externally, dissolved in water, it has been used as a lotion in chronic cutaneous diseases.

D. & M. of Adm.—Gr. j. to gr. iij. twice a day, made into pills with conserve of roses or with manna. For a lotion, gr. j. may be dissolved in fʒi. of distilled water.—*Pills of Keyser.* (Acetate of mercury, gr. xij.; manna, ʒiij.; mix, and divide into 72 pills.) This compound at one time bore a high character on the Continent as a remedy for secondary syphilitic eruptions. Each pill contains gr. $\frac{1}{6}$ of the salt.

Hydrargyri bichloridum, L. Hydrargyri murias corrosivum, D. Corrosivus sublimatus, E. *Bichloride of Mercury: Corro-*

sive Sublimate; Chloride of Mercury. [Hydrargyri Chloridum Corrosivum, U. S. P. *Corrosive Chloride of Mercury.*]

P. P.—Corrosive sublimate is met with in the form of a white, semi-transparent, crystalline mass, or as a white powder; by careful sublimation it may be obtained in regular crystals, the primary form of which is the right rhombic prism. It is inodorous, but has an intensely acrid and disagreeable taste. Its sp. gr. is 5·4 (Kane), 6·5 (Graham).

C. P.—Although this salt is called a bichloride in the London Pharmacopœia, more recent chemical investigations have shown it to be a simple chloride, its composition being HgCl. It is permanent in the air; it fuses at 509°, and boils at about 563°; its vapour is colourless, but very acrid. It is soluble in 16 parts of cold and in 3 parts of boiling water, in $2\frac{1}{3}$ parts of alcohol, and in 3 parts of ether. Its solubility is much increased by the addition of muriatic acid or of the alkaline muriates. A solution of corrosive sublimate gives a yellow precipitate, with hydrates of potash, soda, or lime; a red precipitate with alkaline carbonates; a scarlet with iodide of potassium; and a black with sulphuretted hydrogen. Dropped on gold, it does not tarnish it, but if the moistened surface be touched with a piece of iron or zinc, mercury is immediately precipitated, and leaves a white stain on the gold, which may be removed by heat. Corrosive sublimate may be removed from its solution in water by agitation with ether.

Prep.—*Dub.* "Persulphate of mercury, 5 parts; dried muriate of soda, 2 parts; rub them well together in an earthenware mortar until a very fine powder is formed; then, from a proper vessel, sublime the corrosive muriate of mercury into a receiver." *Lond.* "Mercury, ℔ij.; sulphuric acid, ℔iij.; chloride of sodium, ℔iss.; boil the mercury with the sulphuric acid in a proper vessel till the bipersulphate of mercury remains dry; rub this, when it is cold, with the chloride of sodium in an earthen mortar, then sublime with a heat gradually raised." *Edin.* "Mercury, ʒiv.; sulphuric acid, fʒij., fʒiij.; nitric acid, fʒss.; muriate of soda, ʒiij.; mix the acids, dissolve the mercury in them with the aid of a moderate heat; raise the heat so as to obtain a dry salt; triturate this well with the muriate of soda, sublime in a proper apparatus."

Adulterations.—Corrosive sublimate seldoms contains any impurity; its subliming without any residuum, and its complete and easy solubility in sulphuric ether, the tests given by the Edinburgh College, are sufficient to detect any adulteration.

Th. E.—Corrosive sublimate is a powerful irritant poison, a few grains producing death, preceded by rapid and excessive inflammation of the digestive tube, with great derangement of the nervous system and coma. In small repeated doses, it possesses the usual action of a mercurial, but salivation is more slowly produced by it, and its effects are more decidedly *alterative* than those of any other preparation of the metal. It is, consequently, much employed by those who believe that ptyalism is not essential to the curative effects of mercury in the treatment of secondary syphilis. Corrosive sublimate is employed with much benefit in chronic cutaneous diseases, in chronic rheumatism, in arthritis, periostitis, &c., in which cases it is advantageously combined with a vegetable diaphoretic or tonic. Dissolved in water, it forms a most useful lotion in pso-

riasis and lepra, and an excellent collyrium in the milder forms of ophthalmia.

D. & M. OF ADM.—$\frac{1}{12}$ to $\frac{1}{8}$ of a grain made into pill with crumb of bread, twice or three times daily.—*Pilulæ Corrosivi Sublimati*, DZONDI. (Corrosive sublimate, gr. xij.; dissolve in distilled water, q. s.; and add crumb of bread and white sugar, of each a sufficiency to make ccxl. pills. Each of these pills contains a 20th of a grain of sublimate. Dose, 4 daily. For a lotion or collyrium, gr. ss. to gr. j. may be dissolved in f℥j. of distilled water, or the following preparation may be employed: *Liquor Hydrargyri Bichloridi*, L. (Bichloride of mercury and hydrochlorate of ammonia, of each, gr. x.; distilled water, Oj.; dissolve together in the water.) Dose, for internal use, f℥ss. to f℥ij.

INCOMP.—The alkalies and their carbonates; lime and its carbonate; tartar emetic; nitrate of silver; acetate of lead; iodide of potassium; albumen; soaps; decoction of bark, &c.

In cases of poisoning with corrosive sublimate, albumen, as white of egg, is the best antidote; in its absence, wheaten flour, milk, or iron filings may be used.

HYDRARGYRI BICYANIDUM, L. HYDRARGYRI CYANURETUM, D. [U. S. P.]. *Bicyanide of Mercury; Cyanuret of Mercury; Cyanide of Mercury.*

C. P.—This salt is met with crystallized in rectangular prisms; they are transparent or opaque, colourless and inodorous, with a disagreeable metallic taste.

C. P.—This is a cyanide of mercury, its composition being Hg Cy. It is anhydrous; is permanent in the air; exposed to heat, it is resolved into metallic mercury and cyanogen gas. It is soluble in 8 parts of water at 60°, and in much less boiling water; it is very sparingly soluble in alcohol.

PREP.—*Dub.* "Cyanuret of iron, 6 parts; nitric oxyde of mercury, 5 parts; distilled water, 40 parts; mix the cyanuret of iron and oxyde of mercury, and add the water, previously heated; boil for half an hour with constant agitation, and filter through paper; wash the residuum frequently with warm distilled water. Lastly, evaporate the filtered liquors, and crystallize by cooling." *Lond.* "Percyanide of iron, ℥viij.; binoxyde of mercury, ℥x.; distilled water, Oiv.; boil them together for half an hour, and strain. Evaporate the liquor, that crystals may be formed. Wash what remains frequently with boiling distilled water, and again evaporate the mixed liquors, that crystals may be formed. Bicyanide of mercury may be otherwise prepared by adding as much binoxyde of mercury as will accurately saturate it to hydrocyanic acid distilled from ferrocyanide of potassium with diluted sulphuric acid."

TH. E.—This salt resembles in its effects corrosive sublimate, to which it is preferred by many, as being more soluble, and not so easily decomposed. In Great Britain, however, it is rarely used in medicine, and has been introduced into the Pharmacopœias as a source of hydrocyanic acid.

D. & M. OF ADM.—Same as for corrosive sublimate.

INCOMP.—Sulphuric and muriatic acids; sulphuretted hydrogen, and hydrosulphates.

HYDRARGYRI BINIODIDUM, L. E. [U. S. P.]. *Biniodide of Mercury; Iodide of Mercury; Red iodide of Mercury.*

P. P.—It is a brilliant red powder, which may be obtained in rhomboidal crystals by sublimation. It is inodorous, but has a strong metallic taste. Its sp. gr. is 6·32.

C. P.—It is composed of 1 eq. of mercury and 1 of iodine, Hg I. It is permanent in the air; heated moderately, it becomes yellow; at a temperature of 400° it fuses, and at a higher temperature it sublimes. Cooled rapidly, it recovers its red colour, but when cooled slowly it remains yellow, in which state, when rubbed, the red tint is immediately reproduced. It requires more than 6000 times its weight of water for solution; but it is much more soluble in alcohol and acids, particularly with the aid of heat. It is soluble in a boiling solution of common salt, but a mere trace only is retained as it cools.

PREP.—*Lond.* "Mercury, ʒi.; iodine, ʒx.; alcohol, a sufficiency; rub the mercury and iodine together, adding the alcohol gradually until globules are no longer visible. Dry the powder with a gentle heat, and keep it in a well-stopped vessel." *Edin.* "Mercury, ʒij.; iodine, ʒiiss.; concentrated solution of muriate of soda, cong. j.; triturate the iodine and mercury together, adding occasionally a little rectified spirit till a uniform powder be obtained. Reduce the product to fine powder, and dissolve it in the solution of muriate of soda with the aid of brisk ebullition. Filter, if necessary, through calico, keeping the funnel hot; wash and dry the crystals which form on cooling."

Adulterations.—Owing to faulty preparation, iodide of mercury is apt to contain some of the sesqui or sub iodide; it may also contain sulphuret of mercury, derived from impurity in the metallic mercury employed. These, as well as any fixed impurity, are guarded against by the tests of the *Edin. Phar.* "Entirely vaporizable by heat; soluble entirely in 40 parts of a concentrated solution of muriate of soda at 212°, and again deposited in fine red crystals on cooling."

TH. E.—This is an exceedingly active preparation, producing violent inflammation when placed in contact with the skin. In its medicinal properties it appears to resemble much corrosive sublimate, and may be employed in the same cases. In doses of $\frac{1}{12}$ of a grain given twice daily, and continued for some time, I have found it to act as an excellent tonic in scrofulous habits. As a topical remedy, in the form of ointment, it is applied with benefit to chronic glandular enlargements. Its use, however, requires much caution, especially when applied to raw surfaces.

D. & M. OF ADM.—Gr. $\frac{1}{16}$ to gr. $\frac{1}{8}$, made into pill with any of the tonic vegetable extracts.—*Unguentum Hydrargyri Biniodidi*, L. (Biniodide of mercury, ʒj.; white wax, ʒij; lard, ʒvj.; add the salt to the wax and lard melted together, and mix.) This ointment is much too strong for ordinary use, and should be farther diluted with three or four times its weight of lard.

HYDRARGYRI CHLORIDUM, L. CALOMELAS, D. E. [HYDRARGYRI CHLORIDUM MITE, U. S. P. *Mild Chloride of Mercury.*]—*Calomel* (described in the division *Cathartics*) is the most generally used, and one of the mildest of the preparations of mercury. It may be employed to produce the general effects of mercurials, as before de-

scribed; but it is almost exclusively administered in the treatment of inflammatory and febrile affections, in which it is usually given in combination with small doses of opium, to prevent it from acting on the bowels. As a *sedative* in dysentery and in epidemic cholera, its use has been before alluded to (see page 334); in those diseases it is given in very large doses (a scruple every hour or every second hour until two or three drachms are taken, or in single doses of 3ss. to 3ij.) with the very best effects. As an *alterative*, it is very generally administered to children, who are not near so susceptible to the influence of calomel, or, indeed, of any other mercurial, as adults. To produce ptyalism, this is perhaps the most convenient of all the mercurial compounds, as salivation may be produced with it in a very short space of time, and with very little disturbance to the system generally. Its use as a cathartic has been before described (see page 90). Calomel is also added to other medicines to promote their peculiar effects; thus, it is combined with digitalis or squill to produce *diuresis;* and with Dover's powder or antimonials, to increase their *diaphoretic* properties.

D. & M. of Adm.—As an *antiphlogistic*, gr. iij. to gr. v., combined with one fourth or one half a grain of opium. As an *alterative*, gr. j. to gr. iij. twice a day. To produce *ptyalism*, gr. iij. to gr. v. are usually given night and morning; but by administering calomel in grain doses every hour, a sixth of a grain of opium being added to each dose should it affect the bowels, salivation may be produced in from 12 to 24 hours, provided proper preparatory treatment has been employed.—*Pilulæ Calomelanos comp.* (see page 143). Dose as an alterative, gr. v. to gr. x.—*Pilulæ Calomelanos et Opii*, E. (Calomel, 3 parts; opium, 1 part; conserve of red roses, q. s.; beat into a proper mass; to be divided into pills, each containing gr. ij. of calomel.) Dose, one to two pills.—*Unguentum Calomelanos*, Pereira. (Calomel, 3i.; lard, ʒj.) A most useful application in chronic diseases of the scalp, and in lepra and psoriasis.

Hydrargyri iodidum, L. *Iodide of Mercury; Sub-iodide of Mercury.* [*Protiodide of Mercury*, U. S. P.]

P. & C. P.—This is a greenish-yellow powder, insoluble in both water and alcohol; its composition is Hg^2I. Exposed to light, or by the application of heat, it is readily resolved into metallic mercury and the red iodide. It is insoluble in solution of chloride of sodium.

Prep.—*Lond.* "Mercury, ʒi.; iodine, ʒv.; alcohol, q. s.; rub the mercury and iodine together, adding the alcohol gradually, till globules are no longer visible. Dry the powder immediately with a gentle heat, without the access of light, and keep it in a well-stopped vessel."

Th. E.—This is a milder preparation than the red iodide of mercury, but in other respects its properties are precisely similar. It is scarcely ever used.

D. & M. of Adm.—Gr. j. to gr. iij., in pill.—*Pilulæ Hydrargyri Iodidi*, L. (Iodide of mercury, 3i.; confection of dog rose, 3iij.;

ginger, powdered, ʒi.; beat together till they are incorporated.) Gr. v. contain gr. j. of the iodide. Dose, gr. v. to gr. xv.—*Unguentum Hydrargyri Iodidi*, L. (Iodide of mercury, ʒj.; white wax, ʒij.; lard, ʒvj.; add the iodide of mercury to the wax and lard melted together, and mix.)

HYDRARGYRI NITRATIS UNGUENTUM, D. L. UNGUENTUM CITRINUM, D. E. *Ointment of the Nitrate of Mercury; Citrine Ointment.*

PREP.—*Dub.* "Purified mercury, *by weight*, ʒj.; nitric acid, ʒxiss.; olive oil, *by measure*, ℔j.; prepared lard, ʒiv.; dissolve the mercury in the acid, then mix in the oil and lard melted together, and make an ointment in the same manner as the nitric acid ointment." *Lond.* "Mercury, ʒi.; nitric acid, fʒxi.; lard, ʒvj.; olive oil, fʒiv.; first dissolve the mercury in the acid; then mix the solution, while hot, with the lard and oil melted together." *Edin.* "Nitric acid (dens. 1380 to 1390), fʒixss.; mercury, ʒiv.; axunge, ʒxv.; olive oil, fʒxxxviiiss.; dissolve the mercury in the acid with the aid of a gentle heat. Melt the axunge in the oil, with the aid of a moderate heat, in a vessel capable of holding six times the quantity; and while the mixture is hot, add the solution of mercury, also hot, and mix them thoroughly. If the mixture do not froth up, raise the heat a little till this take place. Keep the ointment in earthenware vessels, or in glass vessels secluded from the light."

When recently prepared. this ointment is of a golden-yellow colour, and has an odour of nitrous acid. But it does not keep well, as, no matter how carefully prepared, after some time it acquires a grayish colour and becomes hard, when it is no longer fit for use. Citrine ointment is an excellent application in many forms of chronic ophthalmia, being especially useful when the eyelids are the seat of the disease; for this purpose it is generally diluted with an equal weight of lard. It is also an excellent application to herpetic eruptions, and to chronic eczema, impetigo or porrigo of the scalp

HYDRARGYRI OXYDUM, L. HYDRARGYRI OXYDUM NIGRUM, D. *Oxyde of Mercury. Sub-oxyde of Mercury. Black Oxyde of Mercury.*

P. & C. P.—This is a black or grayish-black, heavy powder, tasteless and odourless. Its density is 10·69; its composition, Hg^2O. Exposed to heat, it is resolved into metallic mercury and the oxyde, and this change takes place slowly at ordinary temperatures, under the action of strong light; it then acquires a yellowish tinge. It is insoluble in water and in the solutions of the alkalies, but it dissolves in nitric and acetic acids, combining with them to form salts.

PREP.—*Dub.* "Sublimed calomel, 1 part; water of caustic potash, heated, 4 parts; triturate together until the oxyde acquires a black colour, and wash frequently with water; then, with a medium heat, dry the oxyde on bibulous paper." *Lond.* "Chloride of mercury, ʒi.; lime-water, cong. j.; mix, and frequently shake them. Set by, and when the oxyde has subsided, pour off the liquor; lastly, wash it in distilled water until nothing alkaline can be perceived, and dry it in the air, wrapped in bibulous paper."

Adulterations.—This preparation frequently contains the higher oxyde, which may be detected by digesting for a short time with dilute muriatic acid, and straining; the acid dissolves out the higher oxyde only, which is thrown down in the form of a yellow precipitate on the addition of solution of potash. If it contain any

fixed impurity, it will not be entirely dissipated by heat. Metallic mercury may be detected by the black oxyde not being completely soluble in acetic acid.

Th. E.—Black oxyde of mercury produces the usual effects of the mercurial preparation, but, owing to its varying composition, and the difficulty of preserving it unchanged, it is not employed internally. It is applied externally in the form of ointment (consisting of 1 part of oxyde to 5 of lard), and it forms the active part of *black wash*, a most excellent application to chancres and other venereal sores, and which is in very general use.—*Lotio nigra, Black wash.* (Calomel, ʒi.; lime-water, fʒxij.; mix.) This wash must be well shaken, so as to suspend the black oxyde every time it is used. It is employed with benefit in most foul and indolent sores, although not of a venereal origin. Black oxyde of mercury is also employed for mercurial fumigations. (See *Hydrargyri sulphuretum rubrum.*)

Hydrargyri oxydum rubrum, D. Hydrargyri binoxydum, L. *Red Oxyde of Mercury. Binoxyde of Mercury. Oxyde of Mercury.*

P. & C. P.—This oxyde is met with in the form of small, brilliant red scales, when prepared according to the formula of the Dublin Pharmacopœia; but when obtained by the process of the London College, it is an orange-red powder, odourless, with a disagreeable metallic taste. Its composition is HgO, being a protoxyde. At a heat below redness it is entirely resolved into metallic mercury and oxygen, and is therefore frequently employed in chemistry for procuring that gas. It is very slightly soluble in water, the solution acting feebly alkaline on vegetable colours.

Prep.—*Dub.* "Purified mercury, any quantity; put it into a glass matrass with a long, narrow neck, and expose it to a heat of about 600°, until it is converted into red scales." *Lond.* "Bichloride of mercury, ʒiv.; solution of potash, fʒxxviij.; distilled water, Ovj.; dissolve the bichloride in the water; strain, and add the solution of potash. The liquor being poured off, wash in distilled water the powder thrown down until nothing alkaline can be perceived, and dry it with a gentle heat."

Adulterations.—This preparation seldom contains any impurity. The best test of its freedom from adulteration is its complete solubility in muriatic acid.

Th. E.—Red oxyde of mercury is not employed internally in medicine in the present day. It was formerly used to produce salivation. The dose is from gr. $\frac{1}{4}$ to gr. iss., in pill. It may be used externally for the same purposes as the nitric oxyde (see page 136), but is less caustic. It forms the active part of *yellow wash*, which is preferred by some to *black wash*, as an application to venereal sores.—*Lotio flava, Yellow wash.* (Corrosive sublimate, ϑj.; lime-water, fʒxij.; mix.)

Hydrargyri persulphas, D. *Persulphate of Mercury. Sulphate of Mercury.*

Prep.—"Purified mercury and sulphuric acid, of each, 6 parts; nitric acid, 1

part; expose them to heat in a glass vessel, and increase the heat until a perfectly dry, white mass be obtained."

This preparation, the composition of which is Hg O, SO^3, has not been used in medicine. It is introduced into the pharmacopœias as being employed in the preparation of *sulphuric oxyde of mercury* (see page 209), of *sublimed calomel*, and of *corrosive sublimate*.

HYDRARGYRI SUBMURIAS AMMONIATUM, D. HYDRARGYRI AMMONIO-CHLORIDUM, L. HYDRARGYRI PRECIPITATUM ALBUM, E. *White Precipitate. Ammoniated Submuriate of Mercury. Ammonio-chloride of Mercury. White Precipitate of Mercury.*

P. & C. P.—This preparation is in the form of a bulky milk-white powder, odourless, but having a styptic, metallic taste. It is a true chloro-amidide of mercury, its formula being HgCl+HgAd (Kane). It is insoluble in cold water; by boiling water it is decomposed into sal-ammoniac, which is dissolved, and into a heavy yellow powder (*chloro-amidide and binoxyde of mercury*, Kane), which is insoluble in water. White precipitate may be distinguished from calomel by solution of ammonia, which does not alter the former, but blackens the latter. When heated suddenly, it is completely dissipated.

PREP.—*Dub.* "Add to the liquor which is poured off from precipitated calomel sufficient water of caustic ammonia to throw down the metallic salt, which is to be washed with cold water, and dried on bibulous paper." *Lond., Edin.* "Bichloride of mercury (corrosive sublimate, E.), ʒvj.; distilled water, Ovj.; solution of ammonia, fʒviij.; dissolve the corrosive sublimate in the water with the aid of heat; to this, when cold, add the ammonia, stirring frequently; collect the powder thrown down (on a calico filter, E.), and wash it thoroughly (with cold water, E.) (until it is free from taste, then dry it, L.)."

Adulterations.—I have never met with any impurity in this preparation. The London College have given the following tests for its purity, which have reference to its adulterations with starch, with white lead, with sulphate or carbonate of lime, or with black oxyde of mercury: "Totally evaporated by heat. When digested with acetic acid, iodide of potassium throws down nothing either yellow or blue. The powder rubbed with lime-water does not become black. It is totally dissolved by hydrochloric acid, without effervescence. When heated with solution of potash it becomes yellow, and emits ammonia."

TH. E.—White precipitate is not used as an internal remedy. Externally, in the form of ointment, it is an excellent application in many forms of chronic cutaneous diseases, as herpetic eruptions sycosis mentis, impetigo, &c.—*Unguentum Hydrargyri submuriatis ammoniati*, D. *Hydrargyri ammonio-chloridi*, L.—*precipitati albi*, E. (White precipitate, ʒi.; prepared lard, ʒiss.; add the white precipitate to the lard melted over a slow fire, and mix.)

HYDRARGYRI SULPHURETUM NIGRUM, D. HYDRARGYRI SULPHURETUM CUM SULPHURE, L. *Black Sulphuret of Mercury. Æthiops Mineral.*

P. & C. P.—This is a heavy, black, insipid, and inodorous pow-

der, the composition of which is not well known. It is insoluble in water. By heat it is fused, and completely dissipated.

Prep.—*Dub.*, *Lond.* "Mercury (purified, D.), and sulphur (sublimed, D.), of each, 1 part (℔j., L.); rub them together (in a stoneware mortar, D.) until globules are no longer visible."

Adulterations.—The complete dissipation by heat will show the absence of any fixed impurity, such as charcoal or ivory black.

Th. E.—This preparation was at one time employed as an alterative in glandular and cutaneous diseases, but in the present day it is rarely used. The dose of it is from gr. v. to ʒss.

Hydrargyri sulphuretum rubrum, D. Hydrargyri bisulphuretum, L. Cinnabaris, E. *Red Sulphuret of Mercury. Cinnabar.*

P. & C. P.—This is the most common ore of mercury. When prepared for medical use, it occurs in the form of dark-red crystalline masses, which, when reduced to fine powder, are of a brilliant rich red colour, and then constitute the pigment *vermilion.* It is without odour or taste, and is insoluble in water, alcohol, or ether. Its sp. gr. is 8·1, and its composition Hg S. It is permanent in the air; by exposure to heat it is first blackened, and then totally dissipated. It is inflammable, burning with a blue flame, and a sulphurous-acid odour.

Prep.—*Dub.*, *Lond.*, *Edin.* "Mercury (purified, D.), 21 parts (℔ij., L. E.); sulphur (sublimed, D.), 3 parts (ʒv., L. E.); mix the mercury with the sulphur melted (and as soon as the mass swells up, remove the vessel from the fire, L. E.), and cover the vessel closely, to prevent the mass from taking fire. Then reduce the material to powder (as soon as it is cold, E.), and sublime it."

Adulterations.—Cinnabar is very liable to be adulterated with red-lead, with realgar (*sulphuret of arsenicum*), with red oxyde of iron, and with earthy impurities. When heat is applied, oxyde of iron or any earthy matter will be left; if the impurity be red-lead, metallic globules of lead will remain. Sulphuret of arsenicum may be detected by the usual tests for the preparations of that metal (see page 134).

Th. E.—Cinnabar is not used as an internal remedy. It is the preparation of the metal most generally employed for mercurial fumigations; for which purpose it is thrown on a plate of heated iron, and the fumes thus evolved, either inhaled to produce salivation, or directed on ulcerated parts. Mercurial fumigations may, however, be conducted in a much more easy manner, as proposed by Mr. Colles, "by directing the intended dose of cinnabar or gray oxyde of mercury to be mixed with melted wax, and with a cotton wick be moulded into a small candle; this may be stuck on a common plate, and then burned under a curved glass funnel, which is to be raised about an inch from the plate." Fumigations with the *mercurial candle* may be conveniently directed on any part of the body. They have been recently highly recommended by Mr. Colles for those obstinate ulcerations which occur about the roots of the nails.

Indigo. *Indigo.*—A peculiar colouring matter obtained from the leaves of several species of the genus *Indigofera*, especially *Indigofera Tinctoria;* which are natives of India, and belong to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Decandria.*

Prep.—The plants are cut down just before the flowers appear, placed in large vats, and covered with water, in which they are left for about 12 hours, until fermentation takes place, which process is sometimes promoted by using lime-water. The liquor, which has acquired a yellow colour, is drawn off into another vat, beaten with rods, and constantly agitated until it becomes blue, and the indigo precipitates. It is then drained on calico, pressed, and dried.

P. & C. P.—Indigo, as met with in commerce, is of a deep-blue colour, shaded with violet, smooth and hard: rubbed, it acquires a metallic appearance. It is inodorous, but has a somewhat metallic taste. It is a compound substance, consisting of *a glutinous matter*, *indigo blue* (indigotin), *indigo brown*, and *indigo red.* The formula of indigo blue is $C^{16}H^5NO^2$. It is insoluble in water, in cold alcohol, and in ether; it is partially soluble in boiling alcohol.

Th. E.—Indigo has been recently employed on the Continent in the treatment of nervous and spasmodic diseases, and it is said with great success. The diseases in which it has been found to be peculiarly beneficial are idiopathic epilepsy, chorea, hysteria, and convulsions. It should be given in as large doses as the stomach will bear; but, as it acts with much difference on different individuals, the dose at first should not exceed five grains three times a day, but it should be rapidly increased until ʒj., or even more, is taken daily. It is best administered in the form of electuary, made with one part of indigo, and two of sirup or honey; with which aromatics are in general combined. For farther information, the reader is referred to the *British and Foreign Medical Review*, vol. ii., page 214.

Iodinum, D. L. Iodineum, E. *Iodine.*

P. P.—Iodine is generally met with in the form of small crystalline scales, often accreted into masses of a bluish-black colour, with a metallic lustre. It has a strong, disagreeable odour, resembling that of chlorine, and a very acrid taste. From a solution it may be obtained in the form of crystals, which are oblique octohedrons, with a rhombic base. Its density is 4·948.

C. P.—Iodine is an elementary body, existing in combination in both kingdoms of nature. It evaporates slowly at the usual temperature if exposed to the air, and more rapidly if moistened. It fuses at 225°, and boils at 347°. Exposed to an increased temperature, it is volatilized in the form of a beautiful violet-coloured vapour, from whence it has derived its name (Ἰώδης). It requires 7000 parts of pure water for its solution, to which it imparts a brownish colour; it is much more soluble in alcohol, and very soluble in ether. Solutions of the iodides in water dissolve much iodine; the best characteristic of iodine is its action on starch. (See page 183.)

Prep.—Iodine is an article of the Materia Medica in the three British Pharma-

copœias. It is procured by the manufacturers on the large scale from the ashes obtained by burning various species of sea-weed. These ashes, technically called *kelp*, are lixiviated with water, to which they yield about half their weight of salts. The mother-liquor is poured off from these salts, which are deposited by evaporation and crystallization; it is then treated with sulphuric acid, and as soon as all effervescence has ceased, in almost a day or two, it is put into leaden retorts with black oxyde of manganese, and heated to 140° F., when the iodine passes over in the state of vapour, and is condensed in proper receivers. "As met with in commerce, iodine is generally adulterated with variable proportions of water, and being, consequently, unfit for making pharmaceutic preparations of fixed and uniform strength, it must be dried by being placed in a shallow basin of earthenware in a small, confined space of air, with ten or twelve times its weight of fresh-burned lime, till it scarcely adheres to the inside of a dry bottle," *Edin.*

Adulterations.—Iodine is frequently adulterated with fixed substances, such as charcoal, plumbago, black oxyde of manganese, &c., all of which may be readily detected by their not being sublimed on the application of heat, or by their being left as an insoluble residue when iodine is treated with alcohol. Attention has been recently directed by Professor Christison to an adulteration of much consequence, that with water, of which it frequently contains from 15 to 20 per cent.; that is to say, ʒj. of iodine may contain ʒiss., or even more, of water. It may be readily detected by pressing a specimen between folds of filtering paper, or by shaking it in a very dry bottle. If greater accuracy be required, the test of the *Edin. Phar.* may be applied: "Gr. xxxix. with gr. ix. of quicklime, and fʒiij. of water, when heated short of ebullition, slowly form a perfect solution, which is yellowish or brownish if the iodine be pure, but colourless if there be above two per cent. of water or other impurity."

Th. E.—Introduced into the stomach, iodine exerts a local irritant action on that viscus, causing nausea and vomiting; in large doses it produces the effects of an irritant poison, but in many instances, even when taken in enormous quantities, it has produced scarcely any effect. In slight or medicinal doses, iodine acts as a special stimulant to the glandular system, generally at the same time affecting the organs of secretion, increasing the quantity of fluid secreted. Under the continued use of small doses of this substance, the removal or palliation of disease will sometimes take place without any perceptible action on the system generally; in other instances, much emaciation and derangement of the digestive functions will be produced; while the very reverse effect, namely, deposition of fat and increased appetite, has been noticed by many as the consequence of a lengthened administration of iodine. A curious fact, but which has been rarely if at all witnessed in Great Britain, is, that absorption of the mammæ in females, and wasting of the testicles in males, have been produced by the continued administration of iodine. A remarkable train of symptoms, characterizing a peculiar disordered state of the system which has been named *iodism*, frequently arises when the use of this substance in frequent small doses has been persisted in for a long time. These symptoms are nausea, headache, general languor, and loss of appetite, followed by vomiting and purging, extreme depression, fre-

quent, small pulse, great weakness, fainting, dry cough, occasionally with inflammation of the mucous membrane lining the air-passages, and terminating in death, if the iodine be not abandoned in time. Iodism is, however, in the present day, rarely witnessed, and when it does occur, it is easily checked by suspending the use of the medicine.

Iodine is a most valuable remedial agent in the treatment of glandular enlargements, and in scrofulous affections; but its employment is contra-indicated when acute inflammation is present. In *bronchocele*, it has proved more successful than any other remedy which has ever been used; indeed, there are few cases, unless where the thyroid gland has become completely indurated, that will withstand the use of iodine when continued steadily for six weeks or two months; and even cases where the gland is much indurated are often remarkably relieved. In the innumerable varieties of scrofulous affections, this remedy is most extensively used, and with decided advantage. It is found particularly beneficial in glandular swellings, tumours, abscesses, ulcers, ophthalmia, and diseases of the bone occurring in scrofulous constitutions. Iodine has also proved eminently successful in chronic enlargements of the abdominal viscera, particularly the liver, spleen, and ovaries. In fine, it has been proposed as a remedy in phthisis, in amenorrhœa, in leucorrhœa, in gout, in palsy, in chorea, in ascites, in chronic cutaneous diseases, &c.; but in all these cases, its success is very equivocal. The inhalation of the vapour of iodine was at one time very much used in the treatment of phthisis and of chronic bronchitis, but general experience has proved its inutility. An injection composed of one part of tincture of iodine, and three parts of water, is used after tapping for the radical cure of hydrocele. Topically, iodine is employed in the form of tincture or of ointment as a local stimulant in many forms of chronic cutaneous diseases, to enlarged glands, in chronic swellings of the joints, to inflamed bursæ, &c.

D. & M. OF ADM.—Iodine is not administered in substance. The following are the simple preparations which are generally employed, but it is usually given in combination with iodide of potassium (see page 355): *Tinctura Iodinii*, D. E. (Iodine, ℈ij. (ʒiiss., E.); rectified spirit, ʒj. (Oij., E.); dissolve the iodine in the spirit with the aid of a gentle heat and agitation; keep the tincture in well-closed bottles.) One fluid drachm (*Dub.*) contains gr. v. of iodine. Dose, min. v. to min. xx., two or three times a day; it may be given in fʒss. of water, and sweetened with simple sirup.—*Unguentum Iodinii*, D. (Iodine, ℈j.; prepared lard, ʒj.; triturate together, so as to make an ointment.) The simple iodine ointment is seldom used in the present day.

In poisoning with iodine, emetics should be administered, and their operation aided by the use of demulcent and amylaceous drinks, as starch, flour, &c., diffused through tepid water or milk.

MORRHUÆ OLEUM. OLEUM JECORIS ASELLI. *Cod-liver Oil.*

PREP.—This oil is obtained from the liver of the Common Cod, *Morrhua Vulgaris*, and of other allied species, as the Ling, *Gadus Lota*, the Dorse, *Gadus Collarias*, &c. Much of what is met with is imported from Newfoundland, where it is prepared by exposing the livers to the sun to putrefy, when the oil runs from them, and is received in vessels placed underneath. What is drawn in great Britain is procured by simply boiling the fresh livers (exposing them to a temperature of 192°, DONOVAN), expressing and filtering.

P. & C. P.—As generally met with, cod-liver oil is transparent, of a golden-brown colour, with the odour of fresh-boiled cod, and a greasy, bland taste, leaving a disagreeable impression on the palate. Some specimens have a very rancid odour, and an exceedingly nauseous taste. On the Continent, four varieties, of different colours, are usually met with, but in Great Britain we are only acquainted with that above described. It contains two resins, oleic and margaric acids, gelatine, glycerine, colouring matter, some salts of soda and potash, and traces of iodine and bromine. Upon the presence of the two latter substances, it has been supposed by many, and not without reason, that its medicinal virtues depend.

TH. E.—Cod-liver oil, although at one time much employed in England, had fallen completely into disuse, until within the last few years, when some extensive trials with it as a remedy in Germany again directed attention to its value as a therapeutic agent. It has been employed in a great number of diseases, but it appears to be particularly useful in chronic rheumatism, in scrofulous abscesses and caries of the bones, in phthisis, in arthritis, in rickets, in strumous ophthalmia, and in obstinate cutaneous affections. In all these cases, its external application is, it is stated, beneficially combined with its internal use; and to prove successful, its administration must be persevered in for a very long period, in some instances even for years.

D. & M. OF ADM.—The dose of this oil is from f℥ss. to f℥i. two or three times a day, and gradually increased to f℥iij. or f℥iv. It may be given made into an emulsion with solution of potash and some aromatic water. But no matter how it is attempted to be disguised, it leaves a most disagreeable and permanent impression on the mouth and fauces, which, together with the length of time its administration must be persisted in, has prevented it from coming into general use. Dr. Ure has recently suggested the adoption of cod livers as a diet for patients who are recommended to take the oil; and in order to prevent the dissipation of the oil during the cooking, the livers should be suddenly immersed in boiling water, to which sufficient salt has been added to raise the boiling point to 220° F. He states that he has used this diet himself without inconvenience, employing mashed potato as a vehicle for the oil, which exudes on cutting the liver. The oil obtained from the liver of the Skate, *Raia Clavata*, has been proposed as a substitute for cod-liver oil; it is stated to be less disagreeable to the taste, and also more fully efficacious in its therapeutic effects.

NUX-VOMICA, D. L. E. *Seeds of Strychnos Nux-vomica.*—A native of the Indian Continent, of the coasts of Coromandel, and of the

Island of Ceylon; belonging to the natural family *Apocynaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

B. C.—A moderate-sized tree; trunk thick, with a grayish, mottled bark, covered in parts with a reddish-brown efflorescence; branches opposite, long; leaves oval, shining, leathery, 5-nerved; flowers in small terminal corymbs, greenish-yellow; fruit ovoid, about the size of an orange, one-celled, pulpy, containing many seeds

P. P.—Strychnos seeds, *nux-vomica*, are about an inch in diameter and two lines thick, round, nearly flat, umbilicated and slightly convex on one side, concave on the other. Externally they are of an ash-gray colour, satiny, covered with short, yellowish hairs; internally they consist of a horny, whitish or yellowish *albumen*, which separates into two parts, and contains, in a small cavity in the circumference, the *embryo*, with its two acuminate cotyledons. Nux-vomica seeds are with difficulty reduced to powder; they are inodorous, but have an acrid, intensely bitter taste. The bark has been met with in British commerce under the name of false angustura bark (see Cusparia).

C. P.—Nux-vomica consists of two peculiar alkaloids, *strychnia* and *brucia*, in combination with a peculiar acid, *igasuric* or *strychnic acid*, with other unimportant matters. Its medicinal properties depend on the alkaloids, the former of which is the more active, and is officinal in the London and Edinburgh Pharmacopœias. It is prepared as follows:

Lond.—"Nux-vomica, bruised, ℔ij.; rectified spirit, cong. iij.; diluted sulphuric acid, magnesia, and solution of ammonia, of each, q. s.; boil the bruised nux-vomica with a gallon of the spirit for an hour in a retort, to which a receiver is fitted. Pour off the liquor, and again, and a third time, boil what remains with another gallon of spirit, and the spirit recently distilled, and pour off the liquor. Press the nux-vomica, and let the spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an extract. Dissolve this in cold water, and strain. Evaporate the liquor with a gentle heat until it has the consistence of a sirup. To this, while yet warm, gradually add the magnesia to saturation, shaking them together. Set it aside for two days, then pour off the supernatant liquor. Press what remains, wrapped in cloth. Boil it in the spirit, then strain, and let the spirit distil. Add to the residue a very little diluted sulphuric acid mixed with water, and macerate with a gentle heat. Set it aside for 24 hours, that crystals may form. Press and dissolve them. Afterward to these, dissolved in water, add ammonia, frequently shaking them, that the strychnia may be thrown down. Lastly, dissolve this in boiling spirit, and set it aside, that crystals may be produced." *Edin.* "Nux-vomica, ℔j.; quicklime, ʒiss.; rectified spirit, q. s.; subject the nux-vomica for 2 hours to the vapour of steam, chop or slice it, dry it thoroughly in the vapour-bath or hot-air press, and immediately grind it in a coffee-mill. Macerate it for 12 hours in Oij. of water, and boil it; strain through linen or calico, and squeeze the residuum; repeat the maceration and decoction twice with Oiss. of water. Concentrate the decoctions to the consistence of thin sirup; add the lime, in the form of milk of lime; dry the precipitate in the vapour-bath, pulverize it, and boil it with successive portions of rectified spirit, till the spirit ceases to acquire a bitter taste. Distil off the spirit till the residuum be sufficiently concentrated to crystallize on cooling. Purify the crystals by repeated crystallizations."

Strychnia crystallizes in colourless, minute octohedrons, but, as met with in commerce, it is usually in the form of a dirty-white, granular powder; it is odourless, but has an intensely bitter taste. It is soluble in 2500 parts of boiling, and in 6667 parts of cold water; but this last solution, if still farther diluted with 100 times its weight more of water, tastes strongly bitter. It dissolves in diluted alcohol,

but is insoluble in absolute alcohol and in ether. It is permanent in the air; it acts as an alkali on vegetable colours, and combines with acids to form salts. The composition of strychnia is $C^{44}H^{22}N^2O^4$ (Regnault). *Brucia* is not employed in medicine, and therefore need not be particularly described here. In most of its properties it resembles strychnia, but it is more soluble in water, and produces a rich red colour with nitric acid, which change does not occur with perfectly pure strychnia. Powdered nux-vomica is of a grayish-yellow colour; it yields its active principles to water and diluted alcohol, but not to ether.

Adulterations.—According to Christison, powdered nux-vomica is frequently adulterated with common salt, but I have never met with this impurity; it may be readily discovered by treating the powder with cold water, filtering, evaporating, and crystallizing. Strychnia is very liable to adulteration, and, as met with in commerce, is never free from brucia and colouring matter, and, consequently, among the characteristics of the alkaloid, the Edinburgh College have stated that it is strongly reddened by nitric acid, which, as above remarked, does not occur unless brucia be present: that it is sufficiently pure for medical purposes, may be known by the following test: "A solution of gr. x. in ʒiv. of water by means of ʒi. of pyroligneous acid, when decomposed by fʒi. of concentrated solution of carbonate of soda, yields on brisk agitation an adhesive mass, weighing when dry gr. x., and entirely soluble in solution of oxalic acid," *Edin. Phar.*

Th. E.—In very small doses, nux-vomica appears to act as a tonic; but in somewhat larger doses it operates as a special stimulant to the medulla oblongata and spinal marrow, without affecting the sensorium. Its effects are principally exerted on the nerves of motion, as indicated by the spasmodic twitchings of the voluntary muscles, which, when the dose is large or the use of small doses has been continued for some time, amount to violent tetanic spasms. It is a very active poison, so small a dose as ʒss. of the powder, or gr. j. of pure strychnia, having proved fatal; the symptoms which precede death are simply those of tetanus and asphyxia. As a medicinal agent, the principal use of nux-vomica has been in the treatment of chronic paralytic affections; but, as it does not prove equally serviceable in all forms of paralysis, and in some proves absolutely injurious, it will be necessary to state the circumstances which demand or contra-indicate its use. When paralysis is the consequence of inflammatory action in the brain or spinal marrow, or is produced by what is, indeed, the most common cause, the pressure of effused blood on the nervous centres. nux-vomica always proves injurious, unless the inflammatory action has been previously subdued, or a length of time has elapsed since the effusion took place. It more frequently proves beneficial in general than in partial paralysis, and in paraplegia than in hemiplegia. It is, however, often of service in palsy of certain organs, as in incontinence of urine depending on paralysis of the muscles of the bladder, and in some forms of amaurosis, when applied by the ender-

mic method. Nux-vomica or its alkaloid have been also employed in the treatment of other affections of the nervous system, as in chorea, epilepsy, and nervous tremours; but in the latter only does it appear to have proved of service. In epidemic dysentery, its beneficial effects have been highly spoken of in Germany and in Sweden; and by various practitioners it has been found successful occasionally in the treatment of amenorrhœa, of hypochondriasis, of dyspepsia, of colica pictonum, of prolapsus ani, of impotence, &c. It is remarkable that, when administered in paralysis, the effects of nux-vomica on the muscular system are principally, though not, as was one time imagined, entirely confined to the paralyzed parts.

D. & M. of Adm.—Nux-vomica may be administered in powder, in doses of gr. v., gradually increased to gr. xx.; but in the present day it is almost entirely displaced by strychnia.—*Extractum Nucis Vomicæ*, D. E. ("Nux-vomica, rasped, ℥viij.; proof spirit, *by measure*, ℔ij.; digest in a closed vessel for 3 days, filter the liquor, and express what remains by a press: to this add ℔iss. of proof spirit, digest the mixture for three days, and express the residuum. Distil the mixed liquors to a fourth part, and reduce to a proper consistence," D. "Take of nux-vomica, any convenient quantity; expose it in a proper vessel to steam until it is completely softened; slice it, dry it thoroughly, and grind it in a coffee-mill; exhaust the powder either by percolating it with rectified spirit, or by boiling it with repeated portions of rectified spirit, till the spirit comes off free of bitterness. Distil off the greater part of the spirit, and evaporate what remains to a proper consistence in the vapour-bath," E.) Dose, gr. ss., gradually increased to gr. iij., in the form of pill. When carefully prepared, this extract is an excellent preparation, and might be used instead of strychnia, which is very difficult to prepare, and, in general, is so much adulterated.—*Tinctura Nucis Vomicæ*, D. (Nux-vomica, rasped, ℥ij.; rectified spirit, ℥viij.; macerate for 7 days, and filter.) In consequence of its intense bitterness, the tincture is now seldom used internally. Externally it is sometimes employed in the form of embrocation to paralyzed parts. Dose, min. x. to min. xxx.—*Strychnia*, L. E. Dose, $\frac{1}{12}$ of a grain, gradually and slowly increased until its effects are produced; always diminishing the dose at first when a different sample of the drug is employed. It is usually given made into pill with crumb of bread or with conserve of roses; but, as it is difficult to divide it with sufficient accuracy into pills, a preferable method is to dissolve a grain in ʒij. of rectified spirit, with the aid of min. ij. of sulphuric or acetic acid; so that every min. x. of this solution will contain $\frac{1}{12}$ of a grain of the salt of strychnia. When applied by the *endermic* method, gr. ss. of the alkaloid may be sprinkled over the surface, previously denuded of its cuticle. No matter how administered, great attention is requisite during the use of nux-vomica or its alkaloid, in consequence of their great activity as poisons, our ignorance of any chemical antidote, and from the fact of some individuals being much more susceptible of their effects than others.

PLUMBI IODIDUM, L. E. *Iodide of Lead.*

P. & C. P.—Iodide of lead occurs in the form of a fine golden-yellow powder, or in brilliant crystalline scales of the same colour. It is odourless and tasteless; it is permanent in the air, but, by exposure to light, loses its brilliancy; by heat it is fused. It is soluble in 1235 parts of cold, and 194 parts of boiling water; it is soluble in solution of potash. The composition of iodide of lead is Pb I.

PREP.—*Lond.* "Acetate of lead, ʒix.; iodide of potassium, ʒvij.; distilled water, cong. j.; dissolve the acetate of lead in Ovj. of the water, and strain; add to these the iodide of potassium, first dissolved in Oij. of the water, wash what is precipitated, and dry it." *Edin.* "Iodide of potassium and nitrate of lead, of each, ʒss.; water, Oiss.; dissolve the salts separately, each in one half of the water, add the solutions, collect the precipitate on a filter of linen or calico, and wash it with water; boil the powder in cong. iij. of water acidulated with fʒiij. of pyroligneous acid. Let any undissolved matter subside, maintaining the temperature near the boiling point, and pour off the clear liquor, from which the iodide of lead will crystallize on cooling."

Adulterations.—I have not met with any adulteration in iodide of lead. The following tests for its purity are given in the Edinburgh Pharmacopœia: "Bright yellow; gr. v. are entirely soluble with the aid of ebullition in fʒj. of pyroligneous acid diluted with fʒiss. of water; and golden crystals are abundantly deposited on cooling."

TH. E.—The effects of this preparation are not well understood; according to some, its internal use produces the constitutional action of lead; according to others, that of iodine. In Great Britain it is rarely given internally; the dose is from gr. iij. to gr. v.; externally, it is applied in the form of ointment to chronic glandular enlargements, indolent ulcers, and obstinate cutaneous affections occurring in strumous habits.—*Unguentum Plumbi Iodidi*, L. (Iodide of lead, ʒi.; lard, ʒviij.; rub together and mix.)

INCOMP.—Sulphuric and carbonic acids, and their salts.

POTASSII BROMIDUM, L. *Bromide of Potassium.*

P. & C. P.—This salt crystallizes in colourless, transparent, rectangular prisms or cubes. They are inodorous, have an acrid, saline taste, are very soluble in water, and but slightly soluble in alcohol. They are unalterable in the air; exposed to heat, they decrepitate, and fuse at a red heat, without undergoing any change. The composition of bromide of potassium is K Br.

PREP.—*Lond.* "Bromine, ʒij.; carbonate of potash, ʒij., ʒj.; iron filings, ʒj.; distilled water, Oiij.; first add the iron, and then the bromine to Oiss. of the distilled water; set them by for half an hour, frequently stirring them with a spatula. Apply a gentle heat, and when a greenish colour occurs, pour in the carbonate of potash dissolved in the remainder of the water; strain, and wash what remains in Oij. of boiling distilled water, and again strain. Let the mixed liquors be again evaporated, so that crystals may be formed."

Adulterations.—If this salt contain any sulphate, it will give a white precipitate with solution of chloride of barium. It is often adulterated with chloride of potassium or chloride of sodium; the following is the test given by the London College for the detection of either impurity: "Gr. x. decompose 14·28 grains of nitrate of

silver, precipitating a yellow bromide of silver, which is little affected by nitric acid, but is redissolved by ammonia." If it decompose more nitrate of silver than the quantity above stated, it is owing to the presence of a chloride.

Th. E.—The effects of bromide of potassium appear to be analogous to those of iodide of potassium, which will be presently stated. Dr. Williams, of London, employed it internally in enlargements of the spleen, in which he states that it possesses unusual, if not specific powers. But it has not proved equally successful in the hands of other practitioners. Externally, it has been employed in the form of ointment to scrofulous and indolent swellings.

D. & M. of Adm.—Gr. iij. to gr. xij. three times a day, dissolved in water and sweetened with sirup. For an ointment, ℈j. to ʒij. of the salt may be combined with ʒj. of lard; in France, min. vj. of bromine are usually added to this ointment.

Incomp.—Acids; acidulous and metallic salts

Potassii iodidum, L. E. Potassæ Hydriodas, D. *Iodide of Potassium; Hydriodate of Potash.*

P. & C. P.—This salt crystallizes in white, opaque cubes or quadrangular prisms; at present generally met with in fragments of well-defined cubes six to eight lines square, and having a pearly lustre. It has a pungent, saline taste, but is inodorous. It does not deliquesce when pure, unless there is much moisture in the atmosphere; exposed to heat, it decrepitates, and fuses at a red heat, but is not decomposed. 100 parts of water at 64° dissolve 143 parts of the salt: it is soluble in 5 or 6 parts of alcohol. The watery solution is neutral when pure: it possesses the property of dissolving iodine in large quantity, forming a brown liquid, called *ioduretted iodide of potassium.* The composition of iodide of potassium is K I.

Prep.—*Dub.* "Iodine, 1 part; sulphuret of iron, in coarse powder, 5 parts; sulphuric acid, 7 parts; distilled water, 48 parts; water of carbonate of potash, q. s.; rectified spirit, 6 parts; mix the iodine by trituration with 16 parts of the water, and put the mixture into a glass vessel. Pour the acid, previously diluted with 32 parts of water, upon the sulphuret in a matrass, and from a tube fitted to the neck of the matrass, and reaching to the bottom of the vessel containing the iodine and the water, pass the gas through the mixture until the iodine disappears. Immediately evaporate the filtered liquor with a superior heat to an eighth part, and then filter it again. Then add by degrees as much carbonate of potash as will be sufficient to saturate the acid, which is known by the cessation of the effervescence. Then expose the mixture to heat till a dry white salt is left; pour on it the spirit, and dissolve with heat. Finally, pour off the liquor from the residual salt, evaporate to dryness, and preserve in well-stopped bottles." *Lond.* "Iodine, ʒvj.; carbonate of potash, ʒiv.; iron filings, ʒij.; distilled water, Ovj.; mix the iodine with Oiv. of the water, and add the iron, stirring them frequently with a spatula for half an hour. Apply a gentle heat, and when a greenish colour occurs, add the carbonate of potash, first dissolved in the Oij. of water, and strain. Wash what remains with Oij. of boiling distilled water, and again strain. Let the mixed liquors be evaporated, so that crystals may be formed." *Edin.* "Iodine (dry), ʒv.; fine iron-wire, ʒiij.; water, Oiv.; carbonate of potash (dry), ʒij., ʒvj.; with the water, iodine, and iron-wire, prepare solution of iodide of iron as directed for *Ferri Iodidum.* Add immediately, while it is hot, the carbonate of potash previously dissolved in a few ounces of water, and stir carefully, filter the product, and wash the powder on the filter with a little water. Concentrate the liquor at a temperature short of ebullition, till a dry salt be

obtained; which is to be purified from a little red oxyde of iron and other impurities, by dissolving it in less than its own weight of boiling water, or, still better, by boiling it in twice its weight of rectified spirit, filtering the solution, and setting it aside to crystallize More crystals will be obtained by concentrating and cooling the residual liquor."

Adulterations.—Iodide of potassium, as met with in the form of large cubical crystals, seldom contains any impurity. Formerly, when it was not so carefully crystallized, it was very frequently adulterated with carbonate of potash. This fraud is readily detected by the alkalinity of the specimen, by its being deliquescent, and by its giving white precipitates with nitrate of baryto or with lime-water. Water is sometimes present as an impurity; it may be detected by drying the salt and ascertaining the loss of weight. If the salt contain *iodate of potash*, it becomes of a pinkish colour, and emits an odour of iodine when kept for some time; its presence may be readily detected by adding tartaric acid to a solution of the salt; if any iodate be present, free iodine will be immediately developed. The freedom from chloride of potassium or of sodium, impurities not unfrequently met with, is best ascertained by the following test: "A solution of gr. v. in f℥i. of distilled water, precipitated by an excess of solution of nitrate of silver, and then agitated in a bottle with a little aqua ammoniæ, yields quickly by subsidence a clear, supernatant liquid, which is not altered by an excess of nitric acid, or is rendered merely hazy," *Ed. Ph.*

Th. E.—Iodide of potassium is in many respects analogous in its operation to iodine; but it frequently produces very different physiological and therapeutical effects. Like iodine, it is taken into the circulation, and may be detected in the different secretions and excretions, even several days after it has been swallowed. In some individuals, iodide of potassium, when given even in very small doses, produces swelling of the face and tongue, followed by ptyalism, and this effect I have seen produced in one individual who had not taken more than ten grains of the salt; while, on the other hand, many have continued its use for months without the production of iodism, or any other physiological effect whatever. In the different varieties of scrofula and in bronchocele, iodide of potassium is generally given in combination with iodine, the beneficial effects of which in those diseases it seems to increase much. In secondary syphilitic affections, few remedies are so much employed in the present day, or with so much benefit, as iodide of potassium: it is peculiarly adapted for those cases in which mercury has been administered in large quantity in the primary stage, or where the individual is of a scrofulous habit. The particular forms of secondary syphilis in which it is of most service are, sore throat, nodes, caries, and other diseases of the bones, and the tubercular eruptions of the skin. This salt has been also employed with much benefit in the treatment of articular rheumatism, in chronic rheumatism with alteration of structure, in lumbago, in sciatica, in periostitis, in dropsy, in amenorrhœa, in leucorrhœa, in chronic induration and enlargement of various organs, &c. The external use of iodide of

potassium, in the form of ointment or of bath, is usually combined with its internal administration.

D. & M. OF ADM.—Gr. v. to gr. xv. three times a day; to prove beneficial, it must be given in full doses, increased as far as the individual can bear. It is best administered simply dissolved in water and sweetened with sirup; or in some bitter infusion, as in infusion of quassia. The power of the solution of dissolving iodine has been before referred to.—*Liquor Potassii Iodidi comp.*, L. *Iodinei Liquor comp.*, E. (Iodide of potassium, gr. x. (ʒi., E.); iodine, gr. v. (ʒij., E.); distilled water, Oj. (fʒxvj., E.); mix and (with the aid of gentle heat and agitation, E.) dissolve.) Dose, L., fʒj. to fʒss.; E., min. v. to min. xv. It may be farther diluted with water.—*Tinctura Iodinii comp.*, L. (Iodine, ʒi.; iodide of potassium, ʒij.; rectified spirit, Oij.; macerate until they are dissolved, and strain.) Dose, min. x. to min. xxx. in ʒj. of any aromatic water, or in white wine.—*Unguentum Potassæ Hydriodatis*, D. (Hydriodate of potash, ℈j.; prepared lard, ʒi.; rub together and make into an ointment.)—*Unguentum Iodinii comp.*, L. *Unguentum Iodinei*, E. ("Iodine, ʒss.; iodide of potassium, ʒi.; rectified spirit, fʒi.; lard, ʒij.; first rub the iodine and iodide of potassium with the spirit, then mix with the lard," L. The *Edinburgh College* omits the spirit, but uses the same proportions of the other ingredients.) About the size of a nut of this ointment should be rubbed into the affected part twice or three times a day.

INCOMP.—Acids, and acidulous and metallic salts.

SPONGIA OFFICINALIS, D. *The officinal Sponge.*—Sponge is of very general use in the practice of surgery. As a medicinal agent, *burned sponge* was used before the discovery of iodine in the treatment of bronchocele and of scrofulous affections; but, as its medicinal virtues depend on the presence of that substance, it has fallen completely into disuse. The following preparation is still retained in the Dublin Pharmacopœia: *Pulvis Spongiæ ustæ*, D. (Having cut sponge into pieces, beat it, to free it from little stones; burn it in a closed iron vessel till it becomes black and friable, and reduce it to powder.) Dose, ʒj. to ʒiij., made into an electuary with cinnamon and honey.

SULPHURIS IODIDUM. *Iodide of Sulphur.*

P. & C. P.—This compound is met with in brownish plates, with a radiated crystalline structure. It has a strong odour of iodine, and an acrid taste. Its elements are easily disunited, the iodine entirely escaping when it is left exposed to the air. Its composition is S^2I.

PREP.—Bruise together in a mortar 4 parts of iodine and 1 of sulphur; put the mixture into a glass matrass, and expose it to a very gentle heat; as soon as the colour deepens, and union begins to take place, augment the heat gradually until the whole is fused; cool rapidly, and preserve in well-stopped vessels.

TH. E.—Iodide of sulphur is not used internally in medicine. Eternally, in the form of ointment, it has been employed with much

success in the treatment of obstinate cutaneous diseases, particularly lupus, porrigo, acne indurata, herpes, and lepra. The ointment is prepared by rubbing together from gr. xxiv. to gr. xxxvj. of the iodide and ʒi. of lard.

Incomp.—Acids, acidulous and metallic salts.

CHAPTER XXI.

TONICS.

(Corroborants.)

Tonics are substances the continued administration of which in debilitated and relaxed conditions of the body imparts strength and vigour, without producing any sudden excitement. Tonics to a certain extent are stimulants, inasmuch as they arouse the vital energies, but the excitement is slowly produced, and is permanent; if, however, they are given when the system is in a healthy state, their primary action, like that of stimulants, is followed by collapse. This, then, is another example of how necessary it is to remember that medicines are but relative agents, their effects being almost entirely dependant on the state of health or disease in which they are administered. There is no class of remedial agents which requires more discrimination in their administration than tonics; nor any the injudicious use of which more frequently produces evil consequences. The diseases in which this class of remedial agents are principally employed must manifestly be those of diminished power. In no case, however, should they be prescribed where there is tendency to irritation or inflammation of the digestive organs, or where the secretions are in a depraved state, without the previous use of means calculated to remove the former or correct the latter; to effect which, the employment of mild purgatives will, in most instances, be found best adapted. Independently of their tonic properties, some of the remedies contained in this class possess a specific power in ague and other periodical diseases, and hence have been denominated *Febrifuges;* as examples, we may refer to Cinchona bark, Arsenic, &c.

[This last remark suggests that the *specific* property called *Febrifuge*, justly ascribed to certain articles of this class, might with more propriety be denominated *antiperiodic;* and that it is possessed in common by all the *tonics*, though in different degrees of potency, does not admit of doubt among practical men. It is true that, as in other examples of classification and nomenclature, the *modus operandi* of these drugs is inscrutable, or, at least, very little light has been thrown upon it from any source, notwithstanding the numerous speculations of ingenious and learned writers in this department. Indeed, with reference to that characteristic of certain dis-

eases denominated *periodicity*, by which term we mean paroxysmal, at regularly-recurring intervals, we are almost as much in the dark at present as were the ancients, who ascribed them to the influence of the moon (lunatarianism), or to the ebbing and flow of the tides, or to the diurnal revolutions of our globe, or to certain indefinable physical changes which are assumed to take place in the human body at critical periods, having intervals of hours and days, corresponding to the periodicity of different diseases.

Still, however, the facts are perennially before us that all those fevers and other maladies which recur in their paroxysms at regular intervals of hours, days, or weeks, and hence called periodic, are more under the control of the class of medicines called tonics than by any other treatment. And though they do sometimes terminate spontaneously, after a longer or shorter continuance, yet their periodic or paroxysmal character may be broken up by the use of these agents, even when the morbid state upon which they depend may still subsist; and hence may result in relapse, often of an intensity greatly increased, and even complicated by the untimely exhibition of antiperiodics, without reference to the pathological state. Indeed, it would seem that these agents, cinchona, arsenic, &c., possess no febrifuge or curative power other than as antiperiodics; and hence are in no case admissible during the paroxysm, but only during the intermission or interval, when the morbid symptoms are suspended. It is for this reason they are called *curative* remedies, in contradistinction from *palliative*, and, when judiciously used, are only taken in the intervals of health, which are usually and happily of longer continuance than the paroxysm in almost all periodic diseases.

The opinion which, in the present state of our knowledge, seems best entitled to confidence is, that the action of these agents is directly upon the nervous system, imparting increased vitality to all the organic functions, and thus postponing to a later and still later period the accession of paroxysmal diseases; and their success in overcoming periodicity may be attributed to the fact, that this feature of diseases arises from a morbid mobility of the nerves, depending on diminished vitality, and which is best relieved by innervation, thus artificially and even permanently produced.]

Absinthium, L. E. Artemisia absinthium, summitates florentes, D. *Wormwood. The herb (flowering tops, D.) of Artemisia Absinthium.*—Indigenous, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua.*

B. C.—An undershrub, 1 to 1½ feet high, erect, covered with silky hoariness; leaves bipinnatifid, downy, segments lanceolate; flowers in erect leafy panicles, hemispherical, drooping, large, dingy yellow.

P. & C. P.—The whole plant is aromatic and bitter, with a strong, disagreeable odour. Its most important constituents are bitter extractive, bitter resin, and a trace of volatile oil; it yields its properties to both water and alcohol. The herb, when care-

fully dried with a stove heat, retains its aroma and bitterness for a long time.

Th. E.—Wormwood is an excellent bitter tonic, although not much employed at present. It is well adapted for giving tone to the digestive organs in debilitated habits.

D. & M. of Adm.—In powder, ʒss. to ʒi.—*Infusum Absinthii.* (Wormwood, dried, ʒiss.; boiling water, Oij.; infuse for an hour, and strain.) Dose, fʒj. to fʒij.—*Tinctura Absinthii*, Amst. (Dry wormwood, cut fine, one part; proof spirit, six parts; macerate for 6 days, express, and filter.) Dose, fʒij. to fʒss.—*Extractum Artemisiæ Absinthii*, D. (Prepared as the simpler extracts.) In the preparation of this extract, the aroma is completely dissipated, but it still retains the bitterness of the plant. Dose, gr. x. to gr. xx.

Incomp.—The sesqui-salts of iron.

Acidum muriaticum dilutum, D. E. Acidum hydrochloricum dilutum, L. *Dilute Muriatic (Hydrochloric, L.) acid.*

Prep.—*Dub.* "Muriatic acid, *by measure*, 10 parts; distilled water, *by measure*, 11 parts; mix. Sp. gr., 1080." *Lond., Edin.* "Hydrochloric (muriatic, E.) acid, fʒiv.; distilled water, fʒxij.; mix."

Muriatic acid (described in the division *Caustics*), properly diluted, acts as a tonic, and as such is employed in those forms of fever which were formerly supposed to depend on a putrescent condition of the fluids of the body, as in petechial fevers, malignant scarlatina, phagedenic ulceration of the throat, scurvy, &c. It is also an excellent tonic in debility of the digestive organs, particularly when attended with a deposite of phosphates from the urine, and in that state of the alimentary canal which favours the generation of worms. Independently of its action as a caustic, dilute muriatic acid is an excellent addition to gargles in ulcerated sore throat, when there is no tendency to inflammation present.

D. & M. of Adm.—*Acidum Muriaticum Dilutum*, D. Gtt. xx. to gtt. xl.; L. E., fʒss. to fʒj. It should be administered largely diluted with some bitter infusion, as infusion of quassia, or it may be substituted for sulphuric acid in preparing the infusion of roses; fʒj. to fʒij. may be added to an eight-ounce gargle.

Incomp.—Alkalies; tartar emetic; nitrate of silver; acetate of lead; and all carbonates.

Acidum nitricum dilutum, D. L. E. *Dilute Nitric acid.*

Prep.—*Dub.* "Nitric acid, *by measure*, 3 parts; distilled water, *by measure*, 4 parts; mix, avoiding the noxious vapours. Sp. gr., 1280." *Lond.* "Nitric acid, fʒj.; distilled water, fʒix.; mix." *Edin.* "Mix together fʒix. of distilled water, and fʒj. of pure nitric acid, or fʒj., fʒvss., of commercial nitric acid. Density, 1077."

Nitric acid (described in the division *Caustics*), properly diluted, acts as a general tonic, but its powers as such are less manifest than those of the other mineral acids. It is principally used internally, in the treatment of chronic hepatitis, and of secondary syphilitic affections. In syphilis it has been proposed as a substitute for mercury; but its beneficial influence appears to be limited to those

cases in which scrofula or very great debility forbid the use of that medicine, but which, as has been so ably shown by Mr. Colles, of Dublin, are very few in number, and frequently depend rather on its injudicious administration.

D. & M. of Adm.—*Acidum Nitricum Dilutum*, D. Gtt. x. to gtt. xxx.; L. E., f3ss. to f3j. It may be administered in the same form as muriatic acid.

Incomp.—Alcohol; alkalies; oxydes; earths; sulphate of iron; acetate of lead; acetate of potash; and all carbonates and sulphurets.

Acidum nitromuriaticum, D. *Nitromuriatic acid; Aquaregia.*

Prep.—"Nitric acid, *by measure*, 1 part; muriatic acid, *by measure*, 2 parts; mix them in a vessel kept cool, and preserve the mixture in a well-stopped bottle, in a cold, dark place."

P. & C. P.—This liquor has a deep-yellow colour, an intensely acid taste, and exhales an odour both of chlorine and nitrous acid. It is a solution of chlorine and of nitrous acid in water ($ClNO^4HO$). Its most remarkable property is its power of dissolving the metals gold and platinum, by which it may be readily distinguished from other acids.

Th. E.—This preparation was at one time much employed internally, in the same cases as nitric acid; but at present it is only used externally, in the form of bath. Thus employed, it is a very useful remedy in chronic induration or abscess of the liver, in chronic cutaneous diseases, and in syphilitic or mercurial cachexia. When its employment has been continued for some time, it frequently causes salivation, which is to be regarded as evidence of its sanatory influence.

D. & M. of Adm.—Internally, gtt. x. to gtt. xx., largely diluted. —*Balneum Acidi Nitromuriatici.* (Nitromuriatic acid, f℥ivss.; water, cong. iij.; mix in a wooden vessel.) This is to be used daily in the form of a foot-bath; the feet should be kept in the bath for from 15 to 20 minutes, and afterward rubbed well with flannels. Dr. Scott, of Bombay, affirms that this bath operates like a charm, and produces immediate ease, when employed during the passage of biliary calculi through the duct.

Acidum phosphoricum dilutum, L. *Diluted Phosphoric acid.*

P. P.—This is a colourless, inodorous, transparent liquid, with an intensely acid taste. Its density is 1·064 at 62° F.

C. P.—It is a solution of phosphoric acid (PO^5) in water, the London preparation containing 10·5 per cent. of acid. It possesses the usual characteristics of a mineral acid. "Chloride of barium or nitrate of silver being added, whatever is thrown down is readily dissolved by nitric acid. Strips of copper and silver are not at all acted upon by it, nor is it coloured when hydrosulphuric acid is added; 42 grains of carbonate of soda are saturated by 100 grains of this acid, and nothing is thrown down," *Lond. Phar.*

Prep.—*Lond.* "Phosphorus, ℥j.; nitric acid, f℥iv.; distilled water, f℥x.; add the

phosphorus to the nitric acid mixed with the water in a glass retort placed in a sand-bath, then apply heat till f℥viij. are distilled. Put these again into the retort, that f℥viij. may distil, which are to be rejected; evaporate the remaining liquor in a platinum capsule, until only ℥ij. ℥vj. remain. Lastly, add to the acid, when it is cold, as much distilled water as may be sufficient to make it accurately measure f℥xxviij."

Th. E.—Diluted phosphoric acid possesses the tonic properties of the other mineral acids, and may be employed in cases of debility of the digestive organs, and in general cachexia. It is said to be particularly adapted for those cases in which there is a deposite of phosphates from the urine, the earthy phosphates being soluble in an excess of their own acid. It has also been used, it is stated, with much benefit, in cases of unusual depositions of phosphate of lime, as in exostosis, or in the formation of bony tumours. Diluted phosphoric acid is, however, not much used.

D. & M. of Adm.—Min. xx. to f℥j., properly diluted.

Incomp.—Lime-water; calcareous salts; carbonate of soda; and strychnia.

In cases of poisoning with this acid, the same treatment should be followed as in poisoning with muriatic acid. (See page 130.)

Anthemis, L. E. Anthemis nobilis flores, D. *Chamomile. The* (*single*, L. E.) *flowers of Anthemis nobilis.*—Indigenous, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Superflua.*

B. C.—Stem about a foot long, procumbent; leaves bipinnate, a little downy; branches numerous, each branch terminated by a single flower, whose *disk* is yellow, at length conical, and *ray* white.

P. & C. P.—Chamomile flowers have a strong, peculiar, rather agreeable odour, and an aromatic, bitter taste. Their properties depend on bitter extractive and volatile oil. The latter, *Oleum Anthemidis*, L. E., is obtained by the usual process of distillation. It is of a greenish-blue colour, and has the peculiar odour and the aromatic taste of the flowers. One cwt. of flowers yield from f℥iss. to f℥ij. of the oil. Its sp. gr. is 0·9083. It contains a hydrocarbon and an oxydated oil, the last of which, treated with potash infusion, gives *valerianic acid* (Gerhardt and Cahours). Chamomile flowers yield their active properties to both water and alcohol. The single variety of the chamomile flower should be preferred for medical purposes.

Th. E.—Chamomile is an aromatic and bitter tonic. It was formerly in high esteem as a remedy for intermittent fever, but its employment as an internal remedy is at present restricted to those forms of dyspepsia which depend on debility or want of tone of the digestive organs, in which cases it is exceedingly useful. A strong infusion produces vomiting, and, consequently, was at one time much used to aid the action of emetics. Chamomile flowers are commonly employed for preparing warm fomentations. A cold strong infusion is an excellent application. applied two or three times a day, in simple weakness of the eyes, and in the milder forms of hemorrhoidal discharges.

D. & M. OF ADM.—The powder is not administered; the dose would be from 3ss. to 3ij.—*Decoctum Chamæmeli comp.*, D. (Chamomile flowers, dried, ℥ss.; fennel seeds, 3 j.; water, *by measure*, ℔i.; boil for a short time, and strain.) Employed as a basis for enemata, or for fomentations.—*Infusum Chamæmeli*, D. *Infusum Anthemidis*, L. E. (Chamomile, 3ij. (3v., L. E.); boiling water (distilled, L.), *by measure*, ℔ss. (Oj., L. E.); infuse for 24 hours (ten minutes, L. E.) in a covered vessel, and strain.) If taken warm, it produces vomiting. The dose of the cold infusion is f℥i. to f℥ij.—*Extractum Chamæmeli*, D. *Extractum Anthemidis*, E. ("Prepared as the simpler extracts," D. "Chamomile, ℔j.; boil it with cong. j. of water to Oiv.; filter hot; evaporate in the vapour-bath to the right consistence," E.) The volatile oil is dissipated in the preparation of this extract, but it is an excellent bitter tonic. Dose, gr. x. to 3ss.

INCOMP.—*With the infusion:* the mineral acids; sesqui-salts of iron; sulphate of copper; nitrate of silver; and acetate of lead.

ARGENTI NITRAS.—*Nitrate of Silver* (described in the division *Caustics*) may be administered internally in much larger doses than might *à priori* be supposed from its caustic action when applied to the surface of the body; from whence it would appear to be partially decomposed by the free acids of the stomach. Nevertheless, when taken in large quantity, it acts as a powerfully corrosive poison. In small but frequently repeated doses, this salt is an excellent tonic, and also appears to have a specific influence over some convulsive disorders. As a tonic, it is one of the best that can be employed in the early stages of tubercular phthisis; in chronic affections of the stomach, especially where there is morbid sensibility of the gastric and intestinal nerves (for its beneficial effects in this frequently intractable disease we have the high authority of Dr. James Johnson); and in angina pectoris. The principal convulsive disorders in which nitrate of silver has been used are epilepsy and chorea, in both of which it proves very frequently successful, perhaps more so than any other remedy. Its administration must, however, be persevered in for a very long time; and this is attended with a very serious disadvantage, and one which has brought this remedy into great disrepute, namely, the communication of an indelible and permanent leaden or bluish-gray hue to the skin over the whole body. Various attempts have been made to account for this phenomenon, but none are at all satisfactory to my mind; it is certain that this consequence has occurred so frequently (I have myself seen five instances of it), and is of so disagreeable a nature, as to more than counterbalance its remedial powers.

D. & M. OF ADM.—Gr. $\frac{1}{6}$, gradually increased to gr. ij. or gr. iij., three times a day; in some instances so large a dose as gr. xv. have been taken. It is best administered in the form of pill, as the solution blackens the skin wherever it touches it, and also acts more energetically on the stomach. The pills should be made with some

vegetable extract, as extract of gentian or of chamomile; crumb of bread is frequently ordered for this purpose, but it contains chloride of sodium, which decomposes nitrate of silver. To prevent the discoloration of the skin, the surest method is not to continue the use of the medicine too long. Dr. James Johnson states "that there is no instance on record where the complexion has been affected by the medicine when restricted to three months' administration." Dr. A. T. Thomson has suggested the combined use of dilute nitric acid to prevent the decomposition of the nitrate; and more recently, Dr. Patterson, of Rathkeale, has proposed the employment of the iodide instead of the nitrate of silver, which he asserts is equally efficacious as a remedy, without possessing this great disadvantage.—*Liquor Argenti Nitratis*, L. E. (Nitrate of silver, ʒi. (gr. xl., E.); distilled water, fʒ. (gr. 1600, E.); dissolve the nitrate of silver in the water (and strain; then the access of light being prevented, L.); keep the solution in well-closed bottles.) Used only as a test.

Incomp.—Spring and river water; the alkalies, and their carbonates; lime-water; muriatic, sulphuric, phosphoric, tartaric, and hydrocyanic acids, and their soluble salts; iodide of potassium; solution of arsenite of potash; solution of soap; and astringent vegetable infusions.

In poisoning with nitrate of silver, the best antidote that can be employed is common salt: its administration should be followed by demulcent drinks, and, if inflammatory symptoms arise, the usual antiphlogistic means.

Argenti oxydum. *Oxyde of Silver.*—This preparation has been within the last few years employed in the same cases as nitrate of silver. It is prepared by adding caustic potash or lime-water to a solution of nitrate of silver, when it is thrown down as a brown powder, which becomes of a darker colour when dried. It is slightly soluble in distilled water, the solution having an alkaline reaction. Its density is 7·143, and its composition AgO. The dose of this preparation is from gr. ss. to gr. j., three times a day, in the form of pill.

Arsenicum Album.—*Arsenic* (described in the division *Caustics*) is a powerful irritant poison, a few grains being sufficient to occasion death. Its effects, when taken in poisonous doses, vary remarkably; in some instances the most prominent symptoms are those of inflammation of the gastro-intestinal membrane; while in others, coma and extreme depression of the circulation are most marked. When administered in minute doses for a short period, it appears to act as a general tonic, without producing any marked physiological effect; but if its use be long continued, or the doses given be too large, it acts as a slow poison. In medicine, it has been principally used internally in the treatment of ague, and of other diseases of an intermittent type, as in some forms of neuralgia, chorea, and periodic headache; and in chronic cutaneous

diseases, particularly those of a scaly character, and those which affect the scalp. It has been also employed as an internal remedy in epilepsy; in chronic rheumatism, especially when attended with change of structure in the joints; in passive dropsy; in secondary syphilis; in lupus, &c.

D. & M. OF ADM.—The employment of arsenic as a remedy requires great caution, and its effects must be carefully watched; it may be administered in substance in doses of from $\frac{1}{10}$ to $\frac{1}{8}$ of a grain, made into pill with crumb of bread; but, in consequence of the great difficulty of dividing accurately so small a quantity into pills, the following preparation is generally preferred: *Liquor Arsenicalis*, D. E. *Liquor Potassæ Arsenitis*, L. [and U. S. P.]. (Arsenic, powdered (broken into small fragments, L.), and carbonate of potash (from tartar, D.), of each, gr. lx. (gr. lxxx., L. E.); compound spirit (tincture L. E.) of lavender, f℥iv. (f℥v. L. E.); distilled water, *by measure*, ℔ss. (Oi., L. E.); boil the arsenic and carbonate of potash with the water (half the water, L. E.) in a glass vessel till they are dissolved (filter, if necessary, E.); add the spirit of lavender to the cooled liquor; and then, sufficient distilled water, till the whole measures ℔j. [Oi., L. E.]. [U. S. P.—Take of arsenious acid, in small fragments, pure carbonate of potassa, each, *sixty-four* grs.; distilled water, q. s.; comp. spts. of lavender, $\frac{1}{2}$ oz. Boil the arsenious acid and potassa with 12 fluid oz. of the water in a glass vessel till the acid is entirely dissolved. To the solution, when cold, add the lavender, and afterward sufficient distilled water to make it fill exactly the measure of a pint.] One fluid drachm contains gr. ss. of arsenious acid; the preparation of the Dublin College is a little weaker. Dose, min. v. to min. x., two or three times a day. It is incompatible in prescription with acids, lime-water, chloride of calcium, sulphate of magnesia, sulphate of iron, alum, iodide of iron, nitrate of silver, infusion and decoction of bark, &c.—*Pilulæ Asiaticæ*. (Arsenious acid, ℥j.; black pepper, ℥ix.; liquorice root, powdered, and mucilage, of each, q. s.; mix, and divide into 800 pills.) This combination is highly praised in the East Indies as a remedy for elephantiasis, lepra, psoriasis, and syphilitic eruptions. Each pill contains about $\frac{1}{13}$ of a grain of arsenious acid. Dose, one to two daily.

In poisoning with arsenic, if the stomach pump be at hand it should be immediately used, and the stomach repeatedly washed out with tepid water, in which the hydrated sesquioxyde of iron is suspended. The mode of preparing this substance, which is the best antidote for arsenic, and the manner in which it is to be used, will be described hereafter. In the absence of the stomach-pump, emetics of sulphate of zinc or sulphate of copper should be administered, and vomiting promoted by demulcent drinks.

AURANTII CORTEX, L. E. CITRUS AURANTIUM, FRUCTUS TUNICA EXTERIOR ET FOLIA, D. *Bitter-orange rind (and leaves, D.). The outer rind of the fruit of Citrus Vulgaris* (RISSO), L. E. *The outer rind of the fruit, and the leaves of Citrus Aurantium*, D. The

three British Colleges intend to refer to the bitter orange tree, which has been only lately separated as a distinct species from the Citrus Aurantium (described in the division *Refrigerants*). It differs, in being a smaller tree, with more distinctly winged leaf-stalks, in the bitterness of the pulp, and the greater aroma of the rind of the fruit.

P. & C. P.—The rind of the Seville or bitter orange is cut into narrow pieces and dried, the inner white part having been previously removed. It is in rugged, uneven slices, of a dark orange-yellow colour; it has a peculiar, fragrant odour, and a warm, bitter taste, both of which depend on a volatile oil, which exists in concave, minute vesicles. It yields its aroma and taste to both water and alcohol. The leaves are aromatic and bitter; they are used on the Continent, but at present are not employed in Great Britain.

Adulterations.—The rind of the sweet orange is often substituted for that of the bitter orange. It does not possess the peculiar aroma of the latter; and the vesicles in which the volatile oil is contained are convex, not concave.

Th. E.—Bitter orange peel and leaves are feebly tonic. They are employed in medicine principally for their agreeable flavour. The following preparations are officinal: *Infusum Aurantii comp.*, D. L. *Infusum Aurantii*, E. (Orange peel, dried, ʒij. (ʒss., L. E.); lemon peel, fresh, ʒi. (ʒij., L. E.); cloves, bruised, ʒss. (ʒi., L. E.); boiling water (distilled, L.), *by measure*, ℔ss. (Oj., L. E.). Digest for 15 minutes in a vessel lightly covered, and strain ["through linen or calico," E.].) Dose, fʒj. to fʒij.; chiefly used as a vehicle for other medicines.—*Confectio* (*Conserva*, E.) *Aurantii*, L. E. ("Fresh orange peel, separated by a rasp, ℔j.; sugar, ℔iij.; bruise the rind with a wooden pestle in a stone mortar; then, the sugar being added, again pound them until they are thoroughly incorporated," L. "Grate off the outer rind of bitter oranges, and beat it into a pulp, adding gradually thrice its weight of white sugar," E.) An agreeable flavouring adjunct to electuaries, sirups, &c.; it possesses stomachic and tonic properties. Dose, ʒij. to ʒi. —*Sirupus Aurantii*, D. L. E. (Fresh orange peel, ʒviij. (ʒiiss., L. E.); boiling water, *by measure*, ℔vj. (Oj., L. E.); pure sugar, ℔xivss. (℔iij., L. E.); macerate the peel in the water for 12 hours in a vessel lightly covered, and then add the sugar to the liquor (filtered, D. E.); ["and dissolve with the aid of heat," D. E.].) A mild stomachic, used for flavouring. It may be prepared extemporaneously by adding fʒi. of the tincture to Oj. of simple sirup. Dose, fʒij. to fʒss.—*Tinctura Aurantii*, D. L. E. (Orange peel, dried, ʒiij. (ʒiiiss., L. E.); proof spirit, *by measure*, ℔ij. (Oij., L. E.); macerate for 3 (14, L.; 7, E.) days, and filter. "This tincture may be made by percolation, by cutting the peel into small pieces, macerating it in a little of the spirit for 12 hours, and beating the mass into a coarse pulp before putting it into the percolator," E.) Dose, fʒi. to fʒiij.

Incomp.—The salts of iron.

Barytæ murias, D. E. Barii chloridum, L. [and U. S. P.]. *Muriate of Baryta. Chloride of Barium.*

P. & C. P.—This salt crystallizes in flat, four-sided tables, bevelled at the edges. It is colourless and transparent, odourless, with an acrid, bitter taste. It is permanent in ordinary states of the atmosphere, but in very dry air, effloresces slightly. It is fused by a strong heat; is soluble in about twice its weight of temperate, and in somewhat less of boiling water; it is said to be soluble in 400 parts of absolute alcohol. Its density is 2·82, and its composition BaCl+2 HO. Sulphuric acid and the soluble sulphates produce a heavy white precipitate, insoluble in nitric acid with a solution of this salt.

Prep.—*Dub.* "Sulphate of baryta, 10 parts; charcoal, in the finest powder, or lampblack, 1 part; roast the sulphate of baryta in the fire, and throw it while red hot into water; then reduce it to very fine powder in the manner directed for *prepared chalk*. Mix the powders intimately, put them into a crucible, and expose them for 4 hours to a strong heat, until they become red hot. Dissolve the mass, when cold, in a quantity of boiling distilled water, amounting to ten times the weight of the sulphate of baryta, and filter. To this add sufficient muriatic acid to saturate the baryta, avoiding the vapours; then filter the liquor, and crystallize by evaporation and cooling." *Lond.* "Carbonate of barytes, broken into small fragments, ʒx.; hydrochloric acid, Oss.; distilled water, Oij.; mix the acid with the water, and add the carbonate gradually. Then, heat being applied, and the effervescence finished, strain, and boil down the liquor that crystals may be formed." *Edin.* "First process, same as directed by the London College. Or, sulphate of baryta, ℔j.; charcoal, in fine powder, ʒij.; pure muriatic acid, a sufficiency; heat the sulphate to redness; pulverize it finely when cold, and mix it intimately with the charcoal; subject the mixture to a low white heat for three hours in a covered crucible, pulverize the product, put it gradually into Ov. of boiling water, and boil for a few minutes; let it rest for a little over a vapour-bath; pour off the clear liquor, and filter it if necessary, keeping it hot. Pour Oiij. of boiling water over the residuum, and proceed as before. Unite the two liquors, and while they are still hot, or if cooled, after heating them again, add pure muriatic acid gradually so long as effervescence is occasioned. In this process the solutions ought to be as little exposed to the air as possible; and in the last step, the disengaged gas should be discharged by a proper tube into a chimney, or the ashpit of a furnace. Strain the liquor, concentrate it, and set it aside to crystallize."

Adulterations.—As met with in the shops, this salt is very seldom adulterated. The Edinburgh College have given the following test, by which the freedom from any impurity may be readily ascertained: "100 grains in solution are not entirely precipitated by 100 grains of sulphate of magnesia."

Th. E.—Chloride of barium was at one time much employed in scrofulous diseases, and in chronic glandular enlargements, in consequence of its supposed tonic and deobstruent properties. In the present day it has fallen almost completely into disuse. In large doses (an ounce or more), it is a narcotico-acrid poison.

D. & M. of Adm.—It is only used in solution.—*Aqua* (*Solutio*, E.) *Barytæ muriatis*, D. E. *Liquor Barii chloridi*, L. (Chloride of barium, 1 part (ʒi., L. E.); distilled water, 3 parts (fʒi., L. E.); dissolve the salt in the water. "Sp. gr., 1230," D.) Dose, min. v. to min. x., properly diluted. It is much employed as a test for detecting the presence of sulphuric acid and the sulphates.

Incomp.—Sulphuric acid; sulphates; and carbonates.

In poisoning with this salt, the best antidotes are the soluble sulphates, as sulphate of magnesia or sulphate of soda.

Bismuthi subnitras, D. Bismuthi trisnitras, L. Bismuthum album, E. *Subnitrate* (*Trisnitrate*) *of Bismuth. White Bismuth. Magistery of Bismuth.*

P. & C. P.—This salt is met with in the form of a heavy white powder with a pearly lustre, which appears under the microscope to be composed of crystalline grains. It is inodorous and tasteless; very insoluble in water, but readily dissolved by nitric acid. It becomes of a grayish colour when exposed to the light. The composition of this substance has been variously stated; it is most generally believed to be 3 eq. of oxyde of bismuth, and 1 of nitric acid (3 Bi^2O^3 (Kane), $+NO^5$).

Prep.—*Dub.* "Bismuth, powdered, 7 parts; dilute nitric acid, 20 parts, distilled water, 100 parts; add the bismuth gradually to the acid, and dissolve with heat. Mix the solution with water, and set aside, that the powder may subside, which is to be washed with distilled water, and dried on bibulous paper with a gentle heat." *Lond.* "Bismuth, ʒi., nitric acid, fʒiss.; distilled water, Oiij., mix fʒi. of the water with the nitric acid, and dissolve the bismuth in them; then pour off the solution; to this add the remainder of the water, and set by, that the powder may subside. Afterward, the supernatant liquor being poured off, wash the trisnitrate of bismuth with distilled water, and dry it with a gentle heat." *Edin* "Bismuth, in fine powder, ʒi.; nitric acid (dens. 1380), fʒiss.; water, Oiij., add the metal gradually to the acid, favouring the action with a gentle heat, and adding a very little distilled water so soon as crystals or a white powder begin to form. When the solution is complete, pour the liquid into the water, collect the precipitate immediately on a calico filter, wash it quickly with cold water, and dry it in a dark place."

Adulterations.—As generally met with, this salt is free from impurities. It is said sometimes to contain carbonates, which may be detected by the effervescence produced when the powder is dissolved in nitric acid.

Th. E.—In large doses, nitrate of bismuth acts as an irritant poison, causing inflammation of the stomach and intestines. In medicinal doses, it appears to act specifically in painful derangements of the stomach; the beneficial results derived from its use in these affections have been generally ascribed to its tonic properties. More recently, however, they are said to be owing to a peculiar sedative action which it exerts on the nerves of the stomach. The forms of dyspepsia in which alone it proves serviceable are those chronic affections attended with much pain, but unaccompanied with organic disease.

D. & M. of Adm.—Gr. v. to gr. xx., made into an electuary or bolus, with some aromatic powder and sirup, or honey.

Incomp.—Potash; soda; and ammonia.

Calcis murias, D. E. Calcii chloridum, L. *Muriate of Lime. Hydrochlorate of Lime. Chloride of Calcium.*

P. & C. P.—This salt is usually met with in colourless, translucent masses, but it crystallizes from a concentrated solution in long, striated, rhombic prisms. It is inodorous, and has an acrid, bitter, saline taste. Exposed to the air, it deliquesces rapidly; it is very soluble in water and in alcohol. By heat, the water of crystallization is driven off, and at a red heat it fuses. The composition of crystallized chloride of calcium is CaCl+6 HO.

Prep.—*Dub.* "Take of the liquor which remains after the distillation of the water of caustic ammonia, any quantity, filter and expose it in an open vessel to heat until the muriate of lime becomes perfectly dry. Preserve it in very close vessels." *Lond.* "Chalk, ʒv.; hydrochloric acid and distilled water, of each, Oss.; mix the acid with the water, and to these gradually add the chalk to saturation. Then, the effervescence being finished, strain; evaporate the liquor until the salt is dried. Put this into a crucible, and having liquefied it in the fire, pour it upon a flat, clean stone. Lastly, when it is cold, break it into small pieces, and keep it in a well-closed vessel." *Edin.* "White marble, in fragments, ʒx.; muriatic acid of commerce, and water, of each, Oj.; mix the acid and water; add the marble by degrees, and when the effervescence is over, add a little marble in fine powder till the liquid no longer reddens litmus; filter and concentrate to one half; put the remaining fluid in a cold place to crystallize; preserve the crystals in a well-closed bottle; more crystals will be obtained on concentrating the mother-liquor."

Adulterations.—This salt should be perfectly colourless, the presence of iron, with which it is occasionally contaminated, giving it a yellowish tinge. The adulteration with magnesia may be detected by ammonia giving a white precipitate with a solution of the salt. In the following test, the Edinburgh College have guarded against any alkaline impurity: "A solution of 76 grs. in fʒj. of distilled water, precipitated by 49 grs. of oxalate of ammonia, remains precipitable by more of the test."

Th. E.—Chloride of calcium acts as an irritant poison in large doses. In medicine, it was at one time much employed in the treatment of bronchocele and in scrofulous diseases, given internally, and at the same time used, dissolved in water, in the form of bath; its action was said by some to be tonic and deobstruent, by others cathartic. In the present day, however, it has nearly fallen into disuse. It forms a principal ingredient in many mineral waters.

D. & M. of Adm.—It is always administered in solution; the following is a convenient formula: *Calcis muriatis aqua*, D. *Solutio*, E. *Liquor calcii chloridi*, L. (Chloride of calcium (crystallized, E.), 2 parts (ʒiv., L.; ʒviij., E.); distilled water, 7 parts (fʒxij., L. E.); dissolve the salt in the water (and strain, L.). "Sp. gr., 1202," D.) Dose, min. xxx. to fʒij., diluted with water.

Incomp.—Sulphuric acid, and the soluble sulphates; potash and soda, and their carbonates; corbonate of ammonia.

Calumba, L. E. Colomba, radix, D. *Calumba; root of Cocculus palmatus.*—A native of the forests of Mozambique and Oïbo in Africa, belonging to the natural family *Menispermaceæ*, and to the Linnæan class and order *Diœcia Hexandria.*

B. C.—An annual climber; root perennial, tuberose; stem herbaceous; leaves alternate, cordate at the base, 5 to 7 lobed, somewhat hairy; flowers diœcious, small, green, in axillary racemes; fruit, a drupe or berry, one-celled, one-seeded.

P. U. & M. of Prep.—The roots, they are dug up in March, cut horizontally into slices, and dried in the shade; the offsets from the main root are only used.

P. P.—As met with in commerce, calumba root is in circular, flat pieces, from 3 to 10 lines thick, and from half an inch to three inches in diameter. The pieces consist of a brownish-yellow rugous epidermis, a thick yellowish inner-bark, and a light, spongy, woody centre, of a grayish-yellow colour. The flat surfaces are depressed in the centre, and marked with concentric yellowish lines.

It has a feeble, somewhat aromatic odour, and a strong, purely bitter taste.

C. P.—Calumba contains a crystalline, very bitter neutral principle, which has been named *Calumbin*, and on which its medicinal properties depend, about a third of its weight of starch, a trace of volatile oil, gum, wax, &c. Its bitter principle is dissolved out by cold and boiling water, by alcohol, and by ether. As boiling water dissolves out some starch, a warm infusion becomes cloudy as it cools; the Edinburgh College. therefore, employs cold water for preparing the officinal infusion.

Adulterations.—Bryony root, and the root of *Frasera Walteri* (American or false calumba), have been at times sold for the true calumba root. The former may be at once detected by its disagreeable, bitter, somewhat acrid taste; the latter, by its infusion becoming dark-green on the addition of a sesqui-salt of iron, an infusion of the true root remaining unchanged by the same test. Another false calumba is met with in the French drug market, which is known by its containing no starch, a cooled decoction not being affected by tincture of iodine.

Th. E.—Calumba is an excellent bitter tonic, being slightly aromatic, but free of all astringency. It is most usefully employed in the various forms of dyspepsia, depending on want of tone in the digestive organs, and in irritability of the stomach accompanied with vomiting, when there is no tendency to inflammation present. It is also used with much benefit to allay the sympathetic vomiting of pregnancy, and that which depends on diseases of the other abdominal viscera. In the advanced stages of diarrhœa and dysentery, when the use of tonics is indicated, calumba is an excellent remedy.

D. & M. of Adm.—In powder, gr. x. to ʒss.—*Infusum Colombæ*, D. *Infusum Calumbæ*, L. E. ("Calumba, sliced, ʒij. (ʒv., L.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oj., L.); digest (macerate, L.) for two hours in a covered vessel, and strain," D. L. "Calumba, in coarse powder, ʒss.; cold water, about a pint; triturate the calumba with a little water, so as to moisten it thoroughly, put it into a percolator, and transmit cold water till fʒxvj. of infusion be obtained," E.) For the reasons before stated, the Edinburgh preparation is to be preferred; it is usually employed as a vehicle for the more active tonics, and is given in doses of from fʒi. to fʒiij. The salts of iron, the alkalies, and their carbonates do not alter the colour of this infusion, and, consequently, may be advantageously combined with it in prescription.—*Tinctura Colombæ*, D. *Tinctura Calumbæ*, L. E. ("Calumba, sliced, ʒiiss. (ʒiij., L.); proof spirit, ℔ij. (Oij., L.); macerate for 14 days, and filter," D. L. "Calumba, in small fragments (if by percolation, in moderately fine powder), ʒiij.; proof spirit, Oij.; digest for 7 days; pour off the clear liquor, express the residuum strongly, and filter the liquors. This tincture is much more conveniently prepared by the process of percolation, allowing the powder to be soaked with a little of the spirit for six hours before putting it into the percolator," E.) Dose,

f3i. to f3ij.—*Extractum Calumbæ*, B. (Calumba, sliced, 1 part; rectified spirit, 6 parts; digest for 2 hours at a temperature of from 86° to 104° F., and then express; pour upon the residue 2 parts of rectified spirit, digest and express as before; mix the two liquors, distil off the spirit, and evaporate to a due consistence.) An excellent tonic extract. Dose, gr. v. to gr. xx.

Incomp.—Tincture of iodine; nitrate of silver; and the acetates of lead.

Canella, L. E. Canella alba, cortex, D. *Canella bark; Bark of Canella Alba.*—A native of the West India Islands and of South America, belonging to the natural family *Meliaceæ*, and to the Linnæan class and order *Dodecandria Monogynia.*

B. C.—A handsome tree, 40 to 50 feet high; leaves alternate, obovate, shining, coriaceous; flowers small, glaucous-blue, in clusters at the extremities of the branches; fruit, a small, bluish-black berry, generally one-celled.

P. & C. P.—Canella bark is met with in pieces of from 3 to 12 inches long, generally quilled, and from one to three lines thick. They are of a yellowish or pinkish-white colour, have a faint, aromatic odour, and an acrid, very spicy taste. Its medicinal activity is due to volatile oil and bitter extractive; it also contains a peculiar crystalline substance resembling *mannite* in its properties, and which has been named *Canellin.* This bark is often called *false Winter's bark*, as it is frequently sold for the bark of *Drymis Winteri*, hereafter to be described.

Th. E.—Canella is an aromatic tonic of some power; it is seldom employed alone in Great Britain, but is used as an adjunct to the bitter tonics in dyspepsia. It is also combined with cathartics in debilitated states of the digestive organs, and to correct their griping qualities. Dose, in powder, gr. x. to 3ss.

Cascarilla, D. L. E. *Cascarilla bark. Bark of Croton Cascarilla*, D. L. *Probably of Croton Eleuteria, and possibly of other species of the same genus*, E.—Croton Eleuteria, to which, as well as other species, this bark is correctly referred by the Edinburgh College, is a native of Jamaica and the Bahamas; it belongs to the natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia.*

B. C.—A moderate-sized tree; branches angular, somewhat compressed; leaves alternate, ovate, smooth, silvery beneath; flowers whitish, monœcious, in compound axillary racemes.

P. P.—Cascarilla bark occurs in short broken quills or flattened pieces, generally somewhat twisted. It is of a reddish-brown colour, with a whitish or reddish-yellow fissured epidermis; it is hard, and breaks with a close, compact fracture; it has an aromatic, bitter taste, and a peculiar, agreeable odour, which becomes very fragrant when the bark is burned.

C. P.—According to the analysis of Trommsdorff, this bark contains 1·6 per cent. of volatile oil, 15·1 of resin, 18·7 of bitter gummy extract, with chloride of potassium, and 65·6 of lignin. It

yields its active properties to both water and alcohol; the colour of the infusion is deepened by the sesqui-salts of iron.

Th. E.—Cascarilla is an aromatic tonic, devoid of all astringency. It is principally used as an agreeable addition to other remedies of this class in atonic dyspepsia, in the advanced stages of diarrhœa and dysentery, and in convalescence from fevers or other acute diseases. It has also been employed in intermittents as a substitute for cinchona bark.

D. & M. of Adm.—In powder, gr. x. to ʒij.—*Infusum Cascarillæ*, D. L. E. (Cascarilla bark, bruised, ℥ss. (℥iss., L. E.); boiling (distilled, L.) water, ℔ss. (Oj., L. E.); digest (macerate, L.; infuse, E.) for 2 hours in a covered vessel, and strain "through linen or calico," E.) Dose, f℥j. to f℥ij. An agreeable vehicle for more active medicines.—*Mistura Cascarillæ comp.*, L. (Infusion of cascarilla, f℥xvij.; vinegar of squill, f℥i.; compound tincture of camphor, f℥ij.; mix.) "A combination which is of use in chronic affections of the mucous membrane of the lungs." Dose, f℥j. to f℥iss., two or three times a day.—*Tinctura Cascarillæ*, D. L. E. (Cascarilla bark, in coarse (moderately fine, E.) powder (bruised, L.), ℥iv. (℥v., L. E.); proof spirit, *by measure*, ℔j. (Oij., L. E.); macerate for 7 (14, L.) days, and filter. "Proceed by percolation or digestion as directed for tincture of cinchona," E.) Dose, f3i. to f℥ss.

Incomp.—Nitrate of silver, and acetate of lead.

Centaurium, L. E. Centaureum, D. *Common Centaury. Leaves* (*the herb*, L.; *the flowering heads*, E.) *of Erythræa Centaurium.*—Indigenous, belonging to the natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

B. C.—Annual, 8 to 10 inches high; stem nearly simple; leaves ovato-oblong, in distant pairs; flowers handsome, rose-coloured, in corymbose panicles near the top of the stem.

The whole of this plant is odourless, but has a strong, purely bitter taste. It should be collected when in flower, and dried with a stove heat; it imparts its properties, which depend on bitter extractive, to boiling water. The common centaury is scarcely ever used in the present day, except as a domestic remedy; nevertheless, it forms an excellent indigenous substitute for gentian. It is best given in the form of infusion (prepared with ℥ss. of the dried herb, and f℥xij. of boiling water), in doses of f℥i. or f℥ij.

Cetraria, L. E. [and U. S. P.]. Cetraria Islandica, planta, D. *Liverwort. Iceland moss.*—Cetraria Islandica is a native of the northern parts of the British Isles and of the colder regions of both the New and Old Worlds. It belongs to the natural family *Lichenaceæ*, and to the Linnæan class and order *Cryptogamia Algæ.*

B. C.—*Thallus* foliaceous, erect, tufted, laciniated, channelled, dentato-ciliate; *apothecia* brown, appressed, flat, with an elevated border.

P. P.—As met with in the shops, Iceland moss is grayish or

brownish-white, silvery; it has a faint, peculiar odour, and a mucilaginous, somewhat bitter taste.

C. P.—It is composed of 44·6 per cent. of a starchy matter (*lichenin*), 3 per cent. of bitter principle (*cetrarin*), with uncrystallizable sugar, gum, extractive, colouring matter, some salts, and amylaceous fibre. By maceration in cold water the bitter principle is extracted, and the water acquires a brownish colour. By boiling in water about 65 per cent. is dissolved, and, when sufficiently concentrated, the liquid cools into a firm jelly.

Th. E.—Iceland moss is a mild, bitter tonic, and as it is also nutritive, it forms an excellent article of diet in diseases of debility and in convalescence from acute diseases. It is used also as an article of food, the bitter principle having been previously removed by maceration in cold water or in a weak alkaline ley (water 300 parts, and carbonate of potash 1 part); but when its tonic powers are required, the bitter principle should not be removed, as is frequently done. *Cetrarin* has been used in Italy as a substitute for sulphate of quina.

D. & M. of Adm.—*Decoctum Lichenis Islandici*, D. *Decoctum Cetrariæ*, L. (Iceland moss, ℥ss. (℥v., L.); boiling water, *by measure*, ℔j. (Oiss., L.); "digest for two hours in a close vessel, then boil for 15 minutes, and strain the liquor while hot," D. "Boil down to Oj., and strain," L.) Dose, f℥j. to f℥iv.—*Cetrarin*. (Iceland moss, coarsely powdered, any quantity; digest in rectified spirit as long as it acquires a bitter taste; distil off the greater part of the spirit, and filter while hot. The impure cetrarin which is deposited as the liquor cools may be purified by redissolving in boiling alcohol and crystallizing.) Dose, as a febrifuge, gr. ij. to gr. v., every three hours. Sixteen grains thus given in divided doses are said to be sufficient to check the disease.

Incomp.—Potash; the salts of lead and of copper; the sesquisalts of iron; and iodine.

Chiretta, E. *Chiretta or Chirayta. The herb and root of Agathotes Chirayta.*—A native of the northern parts of the Continent of India, belonging to the natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

B. C.—Annual; stems smooth, jointed, branched, erect, about 3 feet high; leaves opposite, amplexicaul, very acute; flowers yellow, very numerous, stalked, in terminal panicles.

P. P.—As met with in the shops, chiretta consists of the root, stems, and branches. The stems are round and smooth, about the thickness of a writing pen, with a shining brown epidermis, and a yellow, spongy pith. The whole plant has a purely bitter taste, without any astringency.

C. P.—Chiretta is composed of resin, yellow bitter matter, brown colouring matter, gum, malic acid, salts of potash and lime, and traces of oxyde of iron (Lassaigne and Boissel). It yields its bitterness to water and to alcohol.

Th. E.—Chiretta is a powerful bitter tonic, bearing much re-

semblance to gentian. Under its use the bowels are relaxed and the secretion of the bile promoted; it is therefore peculiarly adapted as a tonic for dyspepsia accompanied with constipation.

D. & M. OF ADM.—In powder, a bad form, gr. x. to gr. xx.—*Infusum Chirettæ*, E. (Chiretta, ʒiv.; boiling water, Oj.; infuse for two hours, and strain through linen or calico.) This infusion would be better prepared by using double the quantity of chiretta, and employing cold water. Dose, fʒi. to fʒij.—*Tinctura Chirettæ*. (Chiretta, ʒij.; proof spirit, fʒxvj.; macerate for 7 days, and filter.) Dose, fʒj. to fʒij.

CHONDRUS CRISPUS. *Carrageen or Irish moss.*—This substance consists of this and many allied species dried and bleached in the sun. For medical use, it is principally gathered by the peasantry on the southwest coast of Ireland. As commonly met with, it is of a yellowish-white colour, dry, and very crisp; in most of its properties it resembles Iceland moss, but is more mucilaginous and less bitter. It forms a somewhat similar jelly with boiling water or milk, and is frequently used as a substitute for that substance.

[CIMICIFUGA. *Actæa Racemosa. Cohosh. Black Snakeroot*, U. S.—The root. Indigenous, belonging to the natural family *Ranunculaceæ*, and the Linnæan class and order *Polyandra Pentagynia*.

P. P.—The root of a dark-brown colour, internally whitish, taste bitter and astringent; yields its virtues to boiling water.

C. P.—It contains gum, starch, resin, tannin, gallic acid, salts of potash, lime, magnesia, and iron, besides lignin, wax, fatty and colouring matter.

TH. E.—It is used as a tonic, and is supposed to promote the secretions, and hence has been employed as a diuretic, emmenagogue, expectorant, and diaphoretic. In some parts of the United States it is a popular remedy for dropsy, rheumatism, hysteria, and other nervous affections. In pulmonary diseases it has been extolled beyond its merits.

D. & M. OF ADM.—In powder, 10 grs. to 1 drachm. The decoction is more frequently used, 1 oz. of the root being boiled in 1½ lbs. of water down to 1 lb. Dose, ½ to 1 oz., five or six times a day.]

CINCHONA FLAVA, D. E. CINCHONA CORDIFOLIA, L. *Yellow Cinchona Bark. Bark of Cinchona cordifolia*, D. L.—*of an unascertained species of Cinchona*, E.

CINCHONA RUBRA, D. E. CINCHONA OBLONGIFOLIA, L. *Red Cinchona Bark. Bark of Cinchona oblongifolia* (Zea), D.—*of Cinchona oblongifolia* (Lambert), L.—*of an unascertained species of Cinchona*, E.

CINCHONA OFFICINALIS, D. CINCHONA LANCIFOLIA, L. CINCHONA CORONÆ, E. *Pale Cinchona Bark. Crown Bark. Bark of Cinchona lancifolia*, D. L.—*of Cinchona Condaminea*, E.

CINCHONA CINEREA, E. *Gray Bark. Silver Bark. Bark of Cinchona Micrantha.*

Much confusion still exists as to the natural history of the Cinchona barks, and the more recent investigations have proved that the botanical references of the Dublin and London Colleges are altogether erroneous. The exact species from which the yellow and red barks of the pharmacopœias are obtained have not yet been determined; but crown bark (pale bark, D. L.) is undoubtedly the produce of *Cinchona Condaminea*, as also is silver bark of *Cinchona Micrantha*. All the cinchona-trees are inhabitants of the Andes, growing at different elevations from 1200 to 10,080 feet above the level of the sea, and in the region extending from 11° N. latitude to 20° S. latitude. They belong to the natural family *Cinchonaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

B. C.—Trees or tall shrubs; leaves shortly petioled, with plain margins; stipules ovate or oblong, foliaceous, free, deciduous; flowers white or rose-coloured, in terminal corymbose panicles; stamens included within the tube of the corolla; capsule ovoid, elongated, crowned with the teeth of the calyx, 2-celled, 2-valved, containing many winged seeds.

Prep.—Bark-peeling, as it is termed in South America, is practised by the native Indians; the bark of the entire tree, both stem and branches, is removed, the trees being in general previously cut down; it is then dried with great care, so as to preserve its bright colour, the larger and thicker pieces being dried so as to form flat pieces, the smaller being allowed to curl into quills. The epidermis, with the lichens, which naturally grow on it, is carefully preserved on the bark, but if it be very coarse or injured, it is frequently removed. Bark-peeling occupies the entire of the dry season from May to November.

P. P.—It would be quite foreign to the scope of this work to enter into any detailed account of the numerous varieties of cinchona bark which are occasionally met with in commerce. I shall only describe those which most frequently occur, and which are most generally used for medical purposes; and in so doing I shall adopt the classification of the Dublin College, more especially as it is in general followed by the English drug trade; namely, *Yellow*, *Red*, *and Pale Cinchona barks.*

1st. Yellow Bark, *Cinchona flava.*—The botanical origin of this bark, *the China regia* of Von Bergen, as before remarked, is as yet unknown. It is met with in two varieties, *quilled* and *flat*. The *quills* are generally from 9 to 18 inches long, from half an inch to two inches in diameter, and from one to six or seven lines in thickness. They are in general singly quilled, and coated with a very rough, light-gray epidermis; externally, they are marked with longitudinal wrinkles, and traversed with horizontal fissures, often extending completely round the quills; and large patches of grayish-white lichens are usually adherent. Internally, they are smooth, and of a cinnamon-brown colour. The *flat* pieces are from 8 to 18 inches long, from one to four inches broad, and from one to five lines thick; they are in general freed of their epidermis, but, when present, it is similar to that of the quilled bark. The colour is cinnamon-brown. Both sorts break with a fibrous, splintery fracture, and yield an orange-yellow powder. They have a faint, aromatic odour, and an aromatic, bitter, somewhat astringent taste. An account of the cryptogamic plants which are found on this and

the other sorts of cinchona bark has been given by Fée and by Zenker, and an attempt made to distinguish the different barks according to the species which predominate on each, but it is much too refined and difficult for practical purposes. Yellow bark is imported in serons and chests from Arica, a seaport of Bolivia.

2d. Red Bark, *Cinchona rubra*.—The species from which this bark, the *China rubra* of Von Bergen, is obtained, is as yet unknown. It occurs in quills and in flat pieces. The *quills* are from 3 to 15 inches long, from two lines to an inch and a quarter in diameter, and from half a line to two lines thick. Externally, they are of a reddish-brown colour (the smaller quills are grayish-brown); they are usually rough, wrinkled, and furrowed, and have a few scattered patches of grayish white lichens. The *flat* pieces are from two inches to two feet in length, from one to five inches in breadth, and from a third to three quarters of an inch in thickness; they are seldom quite flat, but in general somewhat convex. The epidermis is seldom absent; it is of a reddish or chestnut-brown colour, rough, wrinkled, and usually warty. The inner surface of both sorts is fibrous, and of a reddish-yellow or reddish-brown colour, the thicker pieces being the darkest-coloured. The transverse fracture is fibrous and splintery, and the powder is pale reddish-brown. Red bark has a feebly aromatic, somewhat earthy odour, and a bitter, strongly astringent taste. It is imported in chests, never in serons; good red bark is now scarce in the English market; when met with genuine it is much esteemed, and bears a high price.

3d. Pale Bark, *Cinchona corona*, E.—This bark, which is at present generally called Crown or Loxa bark, the *China Loxa* of Von Bergen, is the produce of the Cinchona Condaminea, of Humboldt and Bonplandt. It is always met with in the form of quills, never in flat pieces. These quills are simple or double, from six to fifteen inches long, from two lines to an inch in diameter, and from one fourth of a line to two lines thick. The epidermis is always present; it is furrowed with numerous transverse fissures or cracks, and frequently, also, with longitudinal splits. Externally, the bark is of a pale grayish-brown colour, and covered with a great number of small whitish and ash-coloured lichens. Internally, it is smooth, and of a pale cinnamon-brown colour; its fracture is fibrous, and it yields a paler-coloured powder than either yellow or red bark. The odour and taste are nearly similar to those of red bark. The fourth variety of bark which is officinal in the Edinburgh Pharmacopœia is also a pale bark, and whenever met with, at least in the Dublin market, is sold under that name; it is rather scarce at present, but it is a very good bark; it may be readily distinguished from other barks by the edges of the most perfect quills being cut obliquely. Both those pale barks are imported in chests and in serons.

Several other varieties of Cinchona bark, although not officinal, are frequently met with in commerce, and are many of them of good quality; a detailed account of them will be found in the re-

cent works of Pereira and of Christison. The so-called *false cinchona barks* will be considered under the head of *adulterations*.

C. P.—According to the analyses of various chemists, particularly Pelletier and Caventou, cinchona barks appear to consist of two peculiar alkaloids, *quina* and *cinchonia*, in combination with a peculiar acid, *kinic* or *cinchonic acid*, together with a variety of tannin, two peculiar colouring matters, *cinchonic red* and *cinchonic yellow*, green fatty matter, kinate of lime, starch, gum, ligneous fibre, and a trace of volatile oil. The proportion of these ingredients, particularly the alkaloids, differs remarkably in the various kinds of bark: thus, *quina* predominates in yellow bark, *cinchonia* in pale bark, while they are contained in nearly equal proportions in red bark. The medicinal properties of bark depend principally on the alkaloids, of which *quina* is the most active; it is officinal in the London Pharmacopœia, but no process is given for its preparation, nor is it employed in medicine. A salt of quina, however, the disulphate, is in very general use as a substitute for cinchona bark; it is officinal in the three British Pharmacopœias, and is prepared as follows:

Quininæ sulphas, *Dub.* "Yellow cinchona bark, in coarse powder, ℔iv.; distilled water, *by measure*, ℔viij.; dilute sulphuric acid, ʒij.; mix, and digest together for four hours in a proper vessel with a superior heat, frequently agitating, then strain, mix what remains of the bark with an equal quantity of water, and strain; repeat the process a third time. Add to the mixed liquors sufficient fresh-burned and slacked lime to saturate the acid; separate the precipitate by means of a paper filter, and add to it ℔iij. *by measure* of rectified spirit; digest for 6 hours with frequent agitation, and filter; digest the residual powder with an equal quantity of rectified spirit, and filter; repeat the process a third time. Evaporate the mixed spirituous liquors nearly to dryness in a water-bath. To the residuum add by degrees sulphuric acid till the acid is slightly in excess. Then crystallize by evaporation and cooling."—Quinæ disulphas, *Lond.* "Yellow bark, bruised, ℔vij.; sulphuric acid, ʒix.; purified animal charcoal, ʒij.; hydrated oxyde of lead, solution of ammonia, and distilled water, of each, q. s.; mix ʒiv., ʒij. of the acid with cong. vj. of distilled water, and add the bark to them; boil for an hour and strain. In the same manner again boil what remains in acid and water, mixed in the same proportions, for an hour, and again strain. Lastly, boil the cinchona in cong. viij. of distilled water for 3 hours, and strain. Wash what remains frequently with boiling distilled water. To the mixed liquors add oxyde of lead, while moist, nearly to saturation. Pour off the supernatant liquor, and wash what is thrown down with distilled water. Boil the liquors for a quarter of an hour, and strain; then gradually add solution of ammonia, to precipitate the quina. Wash this until nothing alkaline is perceptible. Let what remains be saturated with the rest of the sulphuric acid, diluted. Afterward digest with ʒij. of animal charcoal, and strain. Lastly, the charcoal being thoroughly washed, evaporate the liquor cautiously, that crystals may be produced." —Quinæ sulphas, *Edin.* "Yellow bark, in coarse powder, ℔i.; carbonate of soda, ʒviij.; sulphuric acid, fʒss.; purified animal charcoal, ʒij.; boil the bark for an hour in Oiv. of water, in which half the carbonate of soda has been dissolved; strain and express strongly through linen or calico; moisten the residuum with water and express again; and repeat this twice. Boil the residuum for half an hour with Oiv. of water and half the sulphuric acid; strain, express strongly, moisten with water, and express again. Boil the residuum with Oiij. of water, and a fourth part of the acid; strain and squeeze as before. Boil again the residuum with the same quantity of water and acid, strain and squeeze as formerly. Concentrate the whole acid liquids to about a pint; let the product cool; filter it; and dissolve in it the remainder of the carbonate of soda. Collect the impure quina on a cloth, wash it slightly, and squeeze out the liquor with the hand. Break down the moist precipitate in Oj. of distilled water, add nearly fʒj. of sulphuric acid, heat it to 212°, and stir occasionally. Should any precipitate retain its gray colour, and the liquid be neutral, add sulphuric acid drop by drop, stirring constantly till the gray colour dis-

appears. Should the liquid redden litmus, neutralize it with a little carbonate of soda. Should crystals form on the surface, add boiling distilled water to dissolve them. Filter through paper, preserving the funnel hot, set the liquid aside to crystallize; collect and squeeze the crystals; dissolve them in Oj. of distilled water heated to 212°; digest the solution for 15 minutes with the animal charcoal, filter, and crystallize as before. Dry the crystals with a heat not exceeding 140°. The mother-liquors of each crystallization will yield a little more salt by concentration and cooling."

[U. S. P.—Sulphate of Quinia. Yellow bark, in coarse powder, 4 pounds; muriatic acid, 3 fluid ounces; lime, in powder, 5 oz.; water, 5 gallons; sulphuric acid, alcohol, animal charcoal, each, q. s. Boil the bark in one third of the water mixed with one third of the muriatic acid, and strain through linen. Boil the residue twice successively with the same quantity of water and acid as before, and strain. Mix the decoctions, and while the liquor is hot, gradually add the lime, previously mixed with 2 pints of water, stirring constantly until the quinia is completely precipitated. Wash the precipitate with distilled water, and having pressed and dried it, digest it in boiling alcohol. Pour off the liquor and repeat the digestion several times, until the alcohol is no longer rendered bitter. Mix the liquors, and distil off the alcohol until a brown viscid mass remains. Upon this substance, removed from the vessel, pour about ½ a gallon of distilled water, and having heated the mixture to the boiling point, add as much sulphuric acid as may be necessary to dissolve the impure alkali. Then add an ounce and a half of animal charcoal, boil for 2 minutes, filter the liquor while hot, and set it aside to crystallize. Should the liquor before filtration be entirely neutral, acidulate it very slightly with sulphuric acid; should it, on the contrary, change the colour of litmus paper to a bright red, add more animal charcoal. Separate the crystals from the liquor, dissolve them in boiling water slightly acidulated with sulphuric acid, add a little animal charcoal, filter, and set aside to crystallize. Wrap the crystals in bibulous paper, and dry them with a gentle heat. The mother-waters may be made to yield an additional quantity of sulphate of quinia by precipitating the quinia with solution of ammonia, and treating the precipitated alkali with water, sulphuric acid, and animal charcoal, as before.]

The quantity of *disulphate of quina* obtained from yellow bark varies with the quality of the bark; the average may be stated to be from 1½ to 3 per cent. It occurs in very fine, needle-like, silky crystals, of a perfectly white colour: they are flexible, inodorous, and have a very bitter taste. Exposed to air, they effloresce slightly; by a moderate heat they are fused, and by a red heat are decomposed. Sulphate of quina requires for its solution 740 parts of cold, but only 30 of boiling water: it is soluble in 80 parts of cold alcohol (sp. gr., ·850), and in much less of boiling alcohol; it is very soluble in diluted sulphuric acid. It is composed of 2 eq. of quina ($C^{20}H^{12}O^2N$), 1 of sulphuric acid, and 8 of water. *Quina* is most readily obtained by precipitating a solution of the disulphate with ammonia, when it occurs in the form of a snow-white amorphous powder, inodorous, very bitter, alkaline. It requires for its solution 200 parts of boiling water, but is very soluble in alcohol and in ether. *Cinchonia* may be obtained from pale bark by a similar process to that for the preparation of quina from yellow bark. It crystallizes in colourless prisms, is inodorous, and has a feeble, bitter taste. It requires 2500 parts of boiling water to dissolve it, is but slightly soluble in cold ether, and is much less soluble in alcohol than quina; in other respects it bears much resemblance to that alkaloid. Its composition is $C^{20}H^{12}NO$. The other substances of which cinchona bark is composed are unimportant in a medicinal point of view. A third alkaloid, which they named *aricina*, was found by Pelletier and Caventou in Arica or Cuzco bark. Gum is found only in the pale barks.

The active constituents of cinchona bark are extracted by water, alcohol, proof spirit, and the dilute acids. Of these, the acids much diluted and proof spirit are the best solvents. Boiling water dissolves out the active principles more completely than cold water, but continued boiling, as in preparing the decoction, causes the red colouring matter to form a very insoluble compound with the alkaloids. The action of various re-agents on the infusion of cinchona bark has been proposed as a means of ascertaining the medicinal value of the different varieties; but the results obtained by those persons who have published their experiments are so dissimilar, that it is unnecessary to give any account of them.

Adulterations.—The principal frauds that are practised with reference to cinchona bark are, the substitution of the inferior true barks for the finer sorts; the admixture of bark which has been exhausted by successive macerations, and then dried, with good bark; and the substitution of the so-called *spurious or false cinchona barks* for the true barks. Of the false barks, three in particular have been described, namely, Piton bark, Caribean bark, and Pitaya bark. They have all a disagreeable, bitter taste, not aromatic; the latter only has been met with in British commerce; it occurs in quills, thin, compact, grayish-yellow externally, blackish-brown internally. A class of barks called on the Continent *white cinchonas*, but always looked on in the British market as *spurious or false cinchonas*, are often met with, mixed with the officinal barks. They are distinguished by the epidermis being whitish or pale yellowish, micaceous, smooth or not cracked, and adherent to the cortical layers. The other adulterations which have been mentioned above are very difficult to discover, as great experience is required to judge of the quality of bark (especially if in powder) by its physical properties. Of the quality of yellow bark, the best characteristic is the quantity of the alkaloid quina which it yields when treated by the processes of the pharmacopœias; but as they are difficult of application on the small scale, the Edinburgh College has given the following test, by which the greater part of the alkaloid contained is readily procured in an impure state: "A filtered decoction of 100 grs. in f℥ij. of distilled water gives, with f℥i. of concentrated solution of carbonate of soda, a precipitate, which, when heated in the fluid, becomes a fused mass, weighing when cold two grains or more, and easily soluble in solution of oxalic acid." Manufacturers of the disulphate of quina generally, however, employ the test proposed by Guibourt, by which the quantity of lime contained in the specimen is ascertained, for it has been found that those barks which are most rich in quina also contain most lime; the process is as follows: "Mix the bark in fine powder with water so as to form it into a fine paste, place this on paper, filter, and add sulphate of soda to the filtered liquor as long as the white sulphate of lime is precipitated." According to Berzelius, the most efficacious barks are those which contain most tannin; and, consequently, those which in infusion give the largest precipitate with solution of gelatin and with tartar emetic, should be preferred, and

this test is applicable to all sorts of cinchona bark. *Disulphate of quina* is very liable to adulteration; the substances which are generally employed for this purpose are sulphate of lime, gum, sugar or mannite, starch, fatty matter, and sulphate of cinchonia. By the application of the tests of the Edinburgh Pharmacopœia, the freedom from any of these impurities, except that with the salt of cinchonia, will be ascertained: "A solution of gr. x. in f℥j. of distilled water, and two or three drops of sulphuric acid, if decomposed by a solution of ℥ss. of carbonate of soda in two waters, and heated till the precipitate shrinks and fuses, yields on cooling a solid mass, which, when dry, weighs 7·4 grains, and in powder dissolves entirely in solution of oxalic acid." The presence of a salt of cinchonia, from which but few specimens are free in the present day, may be detected by precipitating a solution of the salt in water with ammonia; collecting the precipitate and boiling in rectified spirit; if any cinchonia be present, it will be deposited in crystals as the liquor cools. *Salicin* and *caffein* are stated to be frequently employed on the Continent of late years for the adulteration of disulphate of quina, but they are too dear in Great Britain to be used for that purpose.

Th. E.—The topical action of cinchona bark is astringent, antiseptic, and somewhat irritant; its general effects on the system, especially when given where debility exists, are eminently tonic; and when administered in certain states of disease, it is antiperiodic, that is to say, it possesses the power of checking diseases which recur at regular intervals, as ague, remittent fever, and periodic neuralgia. The cinchona alkaloids without the astringency possess the other properties of bark in a concentrated degree, and, consequently, since their discovery have been substituted to a great extent for the drug itself. Of the two alkaloids, it has been a very generally received opinion that quina is much more active than cinchonia, and, consequently, the use of the latter has been very restricted; recent experience, however, particularly on the Continent, goes far to establish the almost equal activity of cinchonia; indeed, according to some, while equally energetic as a tonic and antiperiodic, it is less irritant. As a topical agent, bark has been used in the form of powder or decoction as an application to foul ulcers with excessive discharge, and to mortified parts; but for this purpose it is inferior to many of the vegetable substances described in the chapter on Astringents. As an internal remedy, bark is the most highly esteemed and most generally employed tonic in the whole Materia Medica. Its employment is indicated in all cases of debility unaccompanied with any tendency to inflammation or to active hemorrhage, and provided, also, the stomach and digestive organs be not in an irritable condition. It is found peculiarly serviceable in those forms of debility with great laxity of the solids, which depend on, or are attended with, profuse discharges from the secreting organs. In the debility attendant on convalescence from acute diseases, cinchona and its alkaloids are also found most efficacious tonics, but they should be at first administered with

great caution, as any over-excitement is apt to cause a recurrence of the febrile or inflammatory symptoms. The principal use, however, of bark (or of disulphate of quina) is as an antiperiodic. In all diseases assuming an intermittent or remittent type, it is found to be the most efficacious remedy which has as yet been discovered; but its *modus operandi* in the cure of those maladies is so obscure, that it is in general said to be *specific*. Bark or the disulphate of quina is best administered during the stage of intermission or remission, and given in as full doses as the stomach can bear, for it is essential to its beneficial influence that vomiting or purging be not produced. If there be irritability of the stomach or inflammatory tendency present, it should be previously removed by appropriate treatment; and, indeed, in most cases of intermittent fever, the administration of an emetic and purgative previous to the employment of cinchona or its alkaloid will be found serviceable. In neuralgic affections, in rheumatism, headache, amaurosis, stricture, &c., recurring at regular intervals, bark is found equally efficacious as in intermittent fever. It is also employed with much benefit in some inflammatory affections when they occur in the old and debilitated, as in subacute rheumatism, in scrofulous ophthalmia, &c. In all the diseases above enumerated, unless where an astringent effect is required, the cinchona alkaloids may be used, and in general are preferred to the bark itself. The advantages which the disulphate of quina (almost the only form in which the alkoloid is administered) possesses are its much greater energy, and its little tendency to produce irritability of the stomach.

D. & M. OF ADM.—Cinchona bark is seldom given in the form of powder in the present day; the dose, as a tonic, is from gr. x. to ʒij. two or three times a day; as an antiperiodic, from ʒi. to ʒij. every second or third hour, but few stomachs can bear such large doses. Its taste is best concealed by milk, with which, however, it should not be mixed until immediately before it is taken.—*Infusum Cinchonæ*, D. L. E. ("Pale bark, in coarse powder, ℥j.; cold water, f℥xij.; triturate the bark with a little of the water, and during trituration pour on the remainder; macerate for 24 hours, frequently agitating, and pour off the clear liquor," D. "Pale bark, bruised (any species of cinchona, according to prescription in powder, E.), ℥i.; boiling (distilled, L.) water, Oj.; macerate (infuse, E.) for 6 (4, E.) hours in a covered vessel, and strain [through linen or calico, E.], L. E.) This preparation is a mild stomachic and tonic, principally used in dyspepsia and in the milder forms of debility. The Dublin infusion is peculiarly adapted for those cases in which there is great irritability of the digestive organs. Dose, f℥i. to f℥iij. —*Decoctum Cinchonæ*, D. L. E. (Pale cinchona bark (pale, yellow, or red, L.; crown, gray, yellow, or red, E.), in coarse powder (bruised, L. E.), ℥j. (ʒx., L.); water (distilled, L.), q. s. (Oj., L.; f℥xxiv., E.); "make a decoction which shall yield, when filtered, ℔j. *by measure*," D. "Boil for 10 minutes in a lightly-covered vessel, and strain the liquor while hot," L. "Boil for ten minutes, let the decoction cool, filter it, and evaporate to f℥xvi.," E.)

Dose, f℥i. to f℥ij.—*Tinctura Cinchonæ*, D. L. E. ("Pale cinchona (yellow, L.), in coarse powder (bruised, L.), ℥iv. (℥viij., L.); proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 7 (14, L.) days, and filter," D. L. "Yellow bark, in fine powder, or any other species of cinchona according to prescription, ℥viij.; proof spirit, Oij.; percolate the bark with the spirit, the bark being previously moistened with a very little spirit, left thus for 10 or 12 hours, and then firmly packed in the cylinder. This tincture may also be prepared, though much less expeditiously, and with much greater loss, by the usual process of digestion, the bark being in that case reduced to coarse powder only," E.) Dose, f℥i. to f℥iij.—*Tinctura Cinchonæ comp.*, D. L. E. (Pale (yellow, E.) cinchona bark, in coarse powder (or fine if percolation be followed, E.; bruised, L.), ℥ij. (℥iv., L. E.); bitter orange peel, dried (bruised, E.), ℥ss. (℥iij., L. E.); serpentaria, bruised (in moderately fine powder, E.), ℥iij. (℥vj., L. E.); saffron (chopped, E.), ℥i. (℥ij., L. E.); cochineal, powdered (bruised, E.), ℈ij. (℥i., L. E.); proof spirit, *by measure*, ℥xx. (Oij., L. E.); "macerate for 14 days, and filter," D. L. "Macerate for 7 days, strain, and express strongly; filter the liquors. It may also be conveniently prepared by percolation, as directed for compound tincture of cardamom," E.) This is a more agreeable but less powerful tonic than the simple tincture. It is commonly known as *Huxham's Tincture of Bark*. Dose, f℥j. to f℥ss.—*Liquor Cinchonæ.* (Prepared by exhausting any quantity of powdered yellow bark in a percolator, first with proof spirit, and then with boiling water, mixing the liquors, and concentrating in vacuo or with a gentle heat.) An excellent and active preparation. Dose, min. xx. to f℥ss.—*Extractum Cinchonæ*, D. L. E. "Pale (yellow, pale, or red, L.) cinchona bark, in coarse powder (bruised, L.), ℔j. (℥xv., L.); water (distilled, L.), *by measure*, ℔vj. (cong. iv., L.); boil for 15 minutes in a vessel nearly closed (boil down in cong. j. of water to Ovj., L.), and strain the liquor while hot. In the same manner, boil down the bark in an equal measure of water 3 (4, L.) times; lastly, all the liquors being mixed, evaporate to a proper consistence," D. L. [This extract should be kept in two states: *soft* for making pills, and *hard* that it may be reducible to powder, D.] "Take of any variety of cinchona, but especially the yellow or red cinchona, in fine powder, ℥iv.; proof spirit, f℥xxiv.; percolate the cinchona with the spirit; distil off the greater part of the spirit, and evaporate what remains in an open vessel over the vapour-bath to a due consistence," E.) The Edinburgh preparation, in which spirit is used as the solvent, is much the most active, but since the introduction of the sulphate of quina into medicine, the extracts are seldom used. Dose, gr. v. to gr. xx.

[*Hydro-alcoholic fluid extract of Red Peruvian Bark.* (*China rubra.*) Take of the red bark, bruised, 20 parts; proof spirit, 100 parts. Prepare as mentioned for the hydro-alcoholic fluid extract of sarsaparilla, till there remains but 36 parts in the still; separate by filtration the colouring and resinous matters, and add to the fluid extract 4 parts of rectified spirit. Two parts represent one of the

bark employed. This is a valuable tonic, and often preferred to quinine in American practice.]

Quina or *Cinchonia* are but seldom employed in the uncombined state, in consequence of their insolubility; nevertheless, they are preferred by some Continental practitioners to any of their salts. The dose of either is from gr. iij. to gr. v., frequently repeated. *Quininæ sulphas*, D. *Quinæ disulphas*, L. *Quinæ sulphas*, E. [*Quiniæ sulphas*, U. S. P.] Dose, gr. i. to gr. v., three or four times a day. As an antiperiodic, it is administered during the intermission, in divided doses, so regulated that from gr. xv. to ʒij., according to circumstances, may be taken in all. It may be administered in the form of pill, made with conserve of roses or mucilage, or dissolved in some aqueous vehicle with the aid of dilute sulphuric acid; it should not be prescribed, as is frequently done, in the infusion of roses, an insoluble precipitate being thrown down. Disulphate of quina may be administered in the form of enema, where there is very great irritability of the stomach; three times the ordinary dose, or even more, may be mixed with an ordinary starch enema, and administered about an hour before the paroxysm. Or it may be introduced into the system by the endermic method, the ordinary dose being sprinkled over the surface of the skin, denuded of the epidermis by means of a blister. In intermittent headache, gr. j. of the disulphate, mixed with gr. iij. of starch, has been snuffed up the nostrils occasionally.—*Pilulæ Quinæ*, U. S. (Sulphate of quina, ʒi.; gum acacia, in powder, ʒij.; sirup, q. s.; mix the sulphate of quina and the gum, and beat them with the sirup so as to form a mass, to be divided into 480 pills.) Each pill contains gr. j. of the disulphate of quina.—*Vinum Quinæ*, Collier. (Quina, ʒi.; citric acid, in crystals, gr. x.; rub together, and dissolve in orange wine, Oj.) An elegant formula. Dose, fʒss. to fʒi.—Quinæ murias. (Prepared by decomposing an aqueous solution of the disulphate by means of an aqueous solution of chloride of barium; filtering to separate the sulphate of baryta, evaporating and crystallizing.) This preparation is preferred by many practitioners to the disulphate, but it is much more expensive; the dose is the same. *Acetate, Citrate, Tartrate, Nitrate, Phosphate, and Tannate of Quina* have been also used in medicine; they are all expensive preparations, and do not appear to me to be superior in any respect to the disulphate. They may be readily prepared by dissolving pure quina to saturation in the respective acids, previously diluted with water, evaporating and crystallizing; their doses are the same as those of the disulphate. The salts of cinchona are prepared in a similar manner to those of quina; their doses are the same.

Incomp.—*With the preparations of Cinchona Bark:* Ammonia; lime-water; carbonate of potash; arsenite of potash; tartar emetic; the sesqui-salts of iron; the acetates of lead; corrosive sublimate; nitrate of silver; tincture of galls; and gelatin. *With disulphate of Quina:* The alkalies and their carbonates; lime-water; tartaric acid; the soluble tartrates; and all vegetable tinctures, infusions, and decoctions containing tannin.

[IODIDUM QUINIÆ. *Iodide* or *Ioduret of Quinine.*

PREP.—Precipitate sulphate of quinine by means of hydriodate of potash.

P. & C. P.—A yellow precipitate, soluble in alcohol, and crystallizes in quadrangular prisms.

TH. E.—Useful in scrofulous tumours, and where iodine and tonics are indicated.

D. & M. OF ADM.—The tincture is prepared by dissolving 30 grs. in 1 oz. of alcohol; and this is given in doses of 10 to 30 drops, gradually increased. Sometimes its tonic power is increased by superadding 3 grains of sulphate of quinine to the ounce.]

CNICUS BENEDICTUS, FOLIA, D. *Blessed thistle. Leaves of Cnicus benedictus.*—A native of the South of Europe, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Æqualis.*

Although at one time highly esteemed as a tonic, the blessed thistle is so little used in the present day as scarcely to merit a place in the Materia Medica. An infusion or decoction made with ʒi. or ʒij. of the leaves, and Oj. of boiling water, was given in doses of fʒiss. to fʒiij.

COCHLEARIA OFFICINALIS, HERBA, D. *Scurvy-grass. Herb of Cochlearia officinalis.*—Indigenous, belonging to the natural family *Cruciferæ*, and to the Linnæan class and order *Tetradynamia Siliculosa.*

This plant was formerly esteemed as a tonic and antiscorbutic, but at present is only used as a domestic remedy, eaten in the fresh state as a salad.

CONTRAJERVA, L. *Contrajerva. Root of Dorstenia Contrajerva.*—A native of South America, belonging to the natural family *Urticaceæ*, and to the Linnæan class and order *Monœcia Tetrandria.*

The contrajerva root of the shops is imported from Brazil, and is obtained from the *D. Braziliensis.* It is of a reddish colour, tapering, from 2 to 3 inches long, and about the thickness of the little finger, covered with slender root fibres. It has a weak, aromatic odour, and a warm, bitter taste. Contrajerva root is a mild aromatic tonic, at one time used in fevers of a low character, but at present nearly obsolete. The dose of the powder is from ϑi. to ϑij.

CUPRUM AMMONIATUM, D. E. CUPRI AMMONIO-SULPHAS, L. *Ammoniated Copper. Ammonio-sulphate of Copper.*

P. P.—As usually met with, this preparation is of a fine azure-blue colour, with an ammoniacal odour, and a stypt c, metallic taste. It is in the form of powder, but may be crystallized in large right rhombic prisms.

C. P.—The exact composition of this salt, as prepared for use in medicine, is doubtful. Exposed to the air, ammonia is given off,

and a green powder left. It is soluble in water, and the solution has an alkaline reaction.

PREP.—*Dub.*, *Lond.*, *Edin.* "Sulphate of copper, 2 parts (℥i., L. E.); carbonate (sesquicarbonate, L.) of ammonia, 3 parts (℥iss., L. E.); triturate them together (in an earthenware mortar, D.) till the effervescence has entirely ceased; wrap the mass in bibulous paper, and dry it in the air. (It should be kept in well-stoppered bottles, D.)"

TH. E.—Ammoniacal sulphate of copper is employed in medicine as a tonic, and, in consequence of its powers as such, also as an antispasmodic. It has been principally used in the treatment of epilepsy, chorea, and other spasmodic affections, and is frequently productive of great benefit when those diseases occur in debilitated constitutions about the period of puberty, and are unassociated with organic disease.

D. & M. OF ADM.—Gr. ss., gradually increased to gr. v., twice or three times daily; it may be given in the form of pill made with bread crumb or with conserve of roses.—*Pilulæ Cupri Ammoniati*, E. (Ammoniated copper, in fine powder, 1 part; bread crumb, 6 parts; solution of carbonate of ammonia, q. s.; beat into a proper pill mass, and divide it into pills, each containing gr. ss. of ammoniated copper.) *Cupri Ammoniati Aqua*, D. E. *Liquor Cupri Ammonio-Sulphatis*, L. (Ammoniated copper, 1 part (℥i., L. E.); distilled water, 100 parts (Oj., L. E.); dissolve the salt in the water, and filter.) Used as a test for arsenious acid (see page 134).

INCOMP.—Acids; potash; soda; and lime-water.

In poisoning with this salt, the treatment is the same as in poisoning with sulphate of copper (see page 65).

CUPRI SULPHAS.—*Sulphate of Copper* (described in the division *Astringents*) has been employed as a tonic in chorea and epilepsy, but the ammoniacal sulphate is more generally preferred in those diseases. For dose and mode of administration, see page 65.

CUSPARIA, L. E. ANGUSTURA, D. *Cusparia or Angustura Bark. Bark of Galipea officinalis*, E.—*of Galipea Cusparia*, L.—*of Bonplandia trifoliata*, D.—The bark is probably obtained from both species of *Galipea* mentioned above. They are natives of the warmer regions of South America, and belong to the natural family *Rutaceæ*, and to the Linnæan class and order *Diandria Monogynia*.

B. C.—*G. officinalis* attains a height only of from 12 to 15 feet; leaves trifoliate, from 8 to 12 inches long, having the odour of tobacco; flowers white, hairy, in stalked, axillary, terminal racemes. *G. Cusparia*, a lofty tree, 60 to 80 feet high; leaves trifoliate, about 2 feet long, agreeably fragrant; flowers white, with fascicles of hairs seated on glandular bodies on the outside, in stalked, almost terminal racemes.

P. P.—Cusparia bark occurs in pieces from 3 to 10 inches in length, some nearly flat, others incompletely quilled, covered externally with a grayish-yellow, soft epidermis, removed from one edge apparently with a sharp knife; internally, it is of a dark yellowish-brown colour, somewhat fibrous. It breaks with a short, resinous fracture; has a peculiar, rather unpleasant odour, and a warm, bitter, somewhat acrid taste.

C. P.—According to the analysis of Fischer, this bark consists of 3·7 per cent. of a peculiar bitter principle (which has been named *Cusparin* by Saladin, who obtained it in a crystalline state by submitting an alcoholic tincture of the bark, prepared by percolation, to spontaneous evaporation), 1·7 of bitter hard resin, 1·9 of balsamic soft resin, 0·3 of volatile oil, gum, lignin, &c. The active properties of the bark are extracted by water and alcohol; it is probable that they depend principally on the neutral principle *Cusparin*.

Adulterations.—About the commencement of this century, the substitution of a highly poisonous bark, which was brought from the East Indies, for true angustura bark, was very common in the British Isles and in various parts of the Continent; but since then, so far as I am aware, it had not been met with until about three years since, when a specimen of the false bark was sent to me from a druggist's in Dublin, labelled *Angustura Bark*. Upon inquiry, I found that a chest containing about 2 cwt. of the bark had lain in their storehouse for upward of forty years, but had never been before dispensed. False angustura bark may be readily distinguished from the true bark by its physical as well as chemical properties. It is generally in more perfectly quilled pieces, always much thicker and heavier; the epidermis is much mottled with grayish spots or covered with a rusty efflorescence; the taste is intensely bitter, very permanent, and it has no odour. The best chemical test is the application of nitric acid to a transverse fracture; it produces a bright red colour with the false bark, but merely deepens the colour of the true bark. The rusty efflorescence on false angustura bark is stained greenish black by the same acid. This false bark was for a long time referred to the *Brucea Antidysenterica*, a native of Africa, but the recent investigations of Christison, O'Shaughnessy, and others, have proved that it is the bark of *Strychnos nux-vomica* (see page 349).

Th. E.—Angustura bark is an excellent tonic, devoid of all astringency. It bears much resemblance to cinchona bark, instead of which it has been frequently employed successfully in South America as a febrifuge. It has never come into general use in Europe, in consequence of the serious accidents which resulted from the fraud above noticed; nevertheless, it will be found very serviceable in atonic dyspepsia, and in the advanced stages of diarrhœa and dysentery.

D. & M. of Adm.—In powder, gr. x. to ʒss.—*Infusum Cuspariæ*, L. E. *Angusturæ*, D. (Angustura bark, bruised, ʒij. (ʒv., L. E.); boiling water (distilled, L.), ℔ss. (Oj., L. E.); macerate for two hours in a covered vessel, and strain [" through linen or calico," E.].) Dose, f℥j. to f℥ij.—*Tinctura Cuspariæ*, E. *Angusturæ*, D. (Angustura bark, in moderately fine powder, ℥ij. (℥ivss., E.); proof spirit, *by measure*, ℔ij. (Oij., E.); "macerate for 14 days, and strain," D. "Made like the tincture of cinchona, and most expeditiously by the process of percolation," E.) Dose, fʒi. to fʒij.

INCOMP.—The sesqui-salts of iron; nitrate of silver; and the acetates of lead.

DRYMIS AROMATICA, CORTEX, D. *Winter's Bark. Bark of Drymis aromatica.*—A native of the countries bordering on the Straits of Magellan. It belongs to the natural family *Winteraceæ*, and to the Linnæan class and order *Polyandria Tetragynia.*

B. C.—A large tree, about 40 feet high; leaves alternate, petiolate, ovate, elongated, glaucous and whitish on the under surface; flowers small, white, solitary, or 3 or 4 on a common footstalk.

P. & C. P.—This bark is at present rather scarce, as it is not much employed; it occurs in rolled quills from ten inches to a foot and a half long, and from half an inch to two inches in diameter, smooth externally, of a reddish-yellow colour, with red oval spots. It has an aromatic colour, and an agreeable, somewhat spicy taste. Its properties depend on volatile oil and resin: it also contains some tannin.

TH. E.—Winter's bark is an excellent aromatic tonic, superior in many respects to canella bark, which is now generally substituted for it. It is so seldom used, that there are no officinal preparations of it contained in any of the British or Continental Pharmacopœias. The dose of the powder is from ℈j. to ʒi.

FEL BOVINUM. *Ox-gall.*

Ox-gall, although at one time much employed in medicine, fell completely into disuse until within the last few years, when it has been again brought under the notice of the profession as an excellent tonic in various forms of dyspepsia. I have myself used it very extensively, and can speak most highly of its remediate powers, particularly in that morbid irritability of the stomach accompanied with vomiting soon after the meals have been taken, provided there is no organic disease present; it also appears to act as a gentle laxative. The following is the preparation which I have employed: *Fel Bovinum inspissatum.* (Ox-gall, any quantity; dilute with an equal quantity of distilled water, set aside for 12 hours until the impurities subside; pour off the clear liquor, boil, and strain through linen or calico. Lastly, evaporate it in a water-bath to the consistence of an extract.) Thus prepared, it is odourless, but has an intensely bitter taste, leaving a somewhat sweetish impression upon the tongue and palate; the dose of it is from gr. v. to gr. x. two or three times a day.

FERRUM, L. FERRI FILUM ET LIMATURA, E. FERRUM, FILA, SCOBS ET OXYDI SQUAMÆ, D. *Iron filings*, L. *Iron in the form of wire, and in the form of filings*, E. *Iron, wire, filings, and scales of the oxyde*, D.—Iron is met with in the metallic state in Russia and America; but it is usually found combined with other minerals in the state of oxyde, sulphuret, carbonate, &c.

PREP.—Metallic iron is an article of the Materia Medica in the three British Pharmacopœias. It is most generally obtained from the native black oxyde, *mag-*

netic iron ore, and from the native carbonate of the protoxyde, *clay iron stone*, by smelting in blast furnaces.

P. & C. P.—Pure metallic iron is of a silver-white colour, but as ordinarily met with it is grayish white, very brilliant, hard, and ductile; it is very malleable, particularly when heated. It has a peculiar taste, and emits an odour when rubbed. At an intense heat it fuses, but before it arrives at the point of fusion, it becomes soft, and in this state possesses the remarkable property of being *welded*. Iron is attracted by the magnet, and becomes itself magnetic by induction, but, if pure, immediately loses its polarity when withdrawn from the magnet. Its sp. gr. is 7·8, and its atomic weight 27·2.

Th. E.—Iron, like other metals, does not exert any influence on the human system while it retains the metallic state; but, as it is very readily oxydated and converted into salts, this change takes place in the stomach soon after it is swallowed, and then the effects of a tonic are produced. Iron filings were at one time much used in medicine, but in the present day they are never employed in regular practice; the dose of them was from gr. x. to 3ss., administered in the form of electuary or bolus made with treacle or honey.

The general effects of the ferruginous preparations, when their use has been continued for some time, are tonic and astringent; but, when they have been given in too large doses or their use persisted in for too long a period, they produce a state of over excitement, characterized by a feeling of determination of blood to the head, of general fulness, and by other uneasy sensations. The morbid state of the system in which the preparations of iron are found most useful is that which has been denominated *anæmia*, in which the blood is deficient, in respect both of its quantity and of the relative proportion of red particles. The diseases in which they have been employed, then, are chiefly those of debility accompanied with or dependant on *anæmia*, as in chlorosis, amenorrhœa, menorrhagia, diseases of the urinary organs, scrofulous affections, passive hemorrhages, certain diseases of the digestive organs, neuralgia, &c. They have also been used with benefit in diseases of an intermittent or remittent type, in dropsical affections, in chronic enlargements of the liver or spleen, in cancer, &c. The employment of the ferruginous preparations is contra-indicated where there is any tendency to inflammation or active hemorrhage in the system, where there is irritability of the digestive organs, in persons of a full habit of body, and in those prone to a determination of blood to the head.

Ferri acetas, D. *Solution of the acetate of Iron.*

P. & C. P.—A liquid of a dark blood-red colour, with an acetic odour, and a strongly acid, chalybeate taste. It is a solution of peroxyde of iron (Fe^2O^3) in acetic acid.

Prep.—*Dub.* "Carbonate of iron, 1 part; acetic acid, 6 parts; digest for 3 days, and filter." Ferri acetatis tinctura, D. "Acetate of potash, 2 parts; sulphate of iron, 1 part; rectified spirit, 26 parts; rub the acetate of potash and sulphate of iron together in an earthenware mortar till they unite into a mass, then dry them with

a medium heat, and triturate with the spirit; digest the mixture, with frequent agitation, for 7 days in a well-stopped bottle; lastly, pour off the tincture from the sediment, and keep it in well-closed vessels."—TINCTURA ACETATIS FERRI CUM ALCOHOLE, D. "Sulphate of iron and acetate of potash, of each, ʒi.; alcohol, *by measure*, ℔ij.; rub the salts together in an earthenware mortar till they unite into a mass; then dry them with a medium heat, and, when cold, triturate with the alcohol. Put the mixture into a well-stopped bottle, and digest for 24 hours, frequently agitating. Lastly, pour off the clear liquor from the sediment, and keep in a well-closed vessel."

TH. E.—Acetate of iron possesses the properties of the ferruginous preparations generally; but, as its composition is rather uncertain, it is scarcely ever used at present. The tinctures were introduced into the pharmacopœia on the authority of Dr. Percival, who thought most highly of their chalybeate powers. The dose of the acetate is from min. v. to min. xx., in some aromatic water; that of the tinctures from min. xxx. to fʒi.; Dr. Percival was in the habit of administering them in asses' milk.

FERRI AMMONIO-CHLORIDUM, L. *Ammonio-chloride of Iron.*

P. & C. P.—This preparation is commonly met with in the form of an orange-yellow, semi-crystalline powder, which attracts moisture when exposed to the air. It emits a feeble odour when moistened, and has a saline, metallic taste. It is readily dissolved by water and by weak spirit. According to Phillips, it is a mechanical mixture of 15 parts of sesquichloride of iron and 85 parts of hydrochlorate of ammonia.

PREP.—*Lond.* "Sesquioxyde of iron, ʒiij.; hydrochloric acid, Oss.; hydrochlorate of ammonia, ℔iiss.; distilled water, Oiij.; mix the sesquioxyde of iron with the hydrochloric acid in a proper vessel, and digest them in a sand-bath for two hours; afterward add the hydrochlorate of ammonia, first dissolved in the distilled water; strain and evaporate all the liquor. Lastly, rub what remains to powder."

TH. E.—This preparation, the *Flores martiales* of the older pharmacologists, was at one time highly esteemed as a tonic and deobstruent in scrofulous affections; but, in consequence of its liability to become decomposed by keeping, and the variable quantity of iron which it contains, it is not often prescribed in the present day.

D. & M. OF ADM.—In the solid state, gr. v. to gr. xv.—*Tinctura Ferri ammonio-chloridi*, L. (Ammonio-chloride of iron, ʒiv.; proof spirit, Oj.; dissolve the salt in the spirit, and strain.) Dose, min. xij. to min. xl.

INCOMP.—Alkalies and their carbonates; lime-water; and all astringent vegetable preparations.

FERRI AMMONIO-TARTRAS. *Ammonio-tartrate of Iron.*

P. & C. P.—This preparation (which has been recently introduced into the practice of medicine, and is not contained in any of the pharmacopœias) is met with in the form of brilliant scales, semi-transparent, of a beautiful reddish-brown colour. It is odourless, and has a sweetish, slightly chalybeate taste. It is soluble in about twice its weight of water at 60°, and in a much less quantity of boiling water. It is insoluble in absolute alcohol and in ether.

It is composed of 1 eq. of tartrate of per-oxyde of iron, 1 of tartrate of ammonia, and 4 of water.

PREP.—"Tartaric acid, 100 drachms; sesquicarbonate of ammonia, crystalline, 39⅓ drachms; sesqui-(*per*)-oxyde of iron, 53½ drachms; muriatic acid, 180 drachms; solution of ammonia and water, of each, q. s.; dissolve the tartaric acid in cong. i. of water, and add the sesquicarbonate of ammonia gradually. Dissolve the sesquioxyde of iron in the muriatic acid by means of a gentle heat; dilute the solution with Ovj. of water, and add a sufficient quantity of solution of ammonia to precipitate the oxyde. Separate this on a flannel filter, wash it with water, until the washings pass tasteless; and add it to the solution containing the bitartrate of ammonia, then apply a gentle heat, by means of a water-bath, until the whole of the sesquioxyde of iron is dissolved, and a deep reddish-brown solution results. Lastly, evaporate this solution, by means of a water-bath, to dryness."—Mr. PROCTER, *in the American Journal of Pharmacy.*

TH. E.—This is an excellent preparation of iron, void of all astringency. It is peculiarly suited as a tonic for those derangements of the uterine organs in which the ferruginous salts are indicated. Its not disagreeable taste, its solubility in water, and the permanency of its composition, give it an advantage over most of the other preparations of iron.

D. & M. OF ADM.—Gr. v. to gr. viij., in the form of powder, pill, or solution, or made into a bolus with honey.

INCOMP.—The mineral acids, and all astringent vegetable preparations.

FERRI BROMIDUM. *Bromide of Iron.*

PREP.—"Bromine and clean iron filings, of each, equal parts; heat together under water till the fluid becomes of a greenish colour; filter and evaporate to dryness."—MAGENDIE.

Bromide of iron is of a brick-red colour, and has a disagreeable, styptic, metallic taste. It deliquesces rapidly when exposed to the air, and is very soluble in water. It has been used on the Continent, it is stated with much success, in hypertrophy of the uterus, and in glandular enlargements. Dose, gr. iij. to gr. viij.—*Pilulæ Ferri Bromidi*, WERNECK. (Bromide of iron, 3i.; extract of liquorice, q. s.; mix, and divide into 60 pills.) One or two, morning and evening.

FERRI CARBONAS SACCHARATUM, E. *Saccharine Carbonate of Iron.*

P. P.—A grayish or bluish-green powder; inodorous, with a sweetish, strongly chalybeate taste.

C. P.—This preparation is composed of "carbonate of protoxyde of iron in an undetermined state of combination with sugar and sesquioxyde of iron," *Ed. Phar.* Sugar or other saccharine matter prevents the decomposition of the carbonate of the protoxyde of iron, which always takes place rapidly from the conversion of the protoxyde into the sesquioxyde and the escape of carbonic acid. The saccharine carbonate remains unchanged for a long time even when exposed to the air. It is insoluble in water or alcohol; but dissolves completely in muriatic acid, with effervescence.

PREP.—*Edin.* "Sulphate of iron, ℥iv.; carbonate of soda, ℥v.; pure sugar, ℥ij.; water, Oiv.; dissolve the sulphate and carbonate each in Oij. of the water; add the

solutions, and mix them: collect the precipitate on a cloth filter, and immediately wash it with cold water, squeeze out as much of the water as possible, and, without delay, triturate the pulp which remains with the sugar previously in fine powder. Dry the mixture at a temperature not much above 120°."

Adulterations.—This preparation is not liable to adulteration; that it has been properly prepared may be known by "its colour being grayish-green, and by its being easily soluble in muriatic acid, with brisk effervescence," *Edin. Phar.*

Th. E.—Carbonate of the protoxyde of iron is one of the best and most active of the ferruginous salts, and the permanency of its composition in the form now described renders this preparation a valuable addition to the Materia Medica. It is peculiarly adapted for children and delicate females when the employment of a chalybeate tonic is indicated. Carbonate of iron held in solution by an excess of carbonic acid is the active principle of many chalybeate mineral waters.

D. & M. of Adm.—Gr. v. to gr. xxx., in the form of powder, or made into an electuary with sirup or honey.—*Pilulæ Ferri Carbonatis*, E. (Saccharine carbonate of iron, 4 parts; red-rose conserve, 1 part; beat them into a proper mass, to be divided into five-grain pills.) Dose, 1 to 4 pills. In the following preparations, the carbonate of iron, prevented from undergoing decomposition by the presence of saccharine matter, is the active ingredient: *Mistura Ferri composita*, D. L. E. (Myrrh, powdered, ʒi. (ʒij., L. E.); carbonate of potash, gr. xxv. (ʒi., L. E.); rose-water, ʒviiss. (fʒxviij., L. E.); sulphate of iron, powdered, ℈j. (℈iiss., L. E.); spirit of nutmeg, ʒss. (fʒj., L. E.); pure sugar, ʒi. (ʒij., L. E.); rub together the myrrh with the spirit of nutmeg and the carbonate of potash, and to these, while rubbing, add first the rose-water with the sugar, then the sulphate of iron. Put the mixture immediately into a proper glass vessel, and stop it.) This mixture, which was introduced into the pharmacopœias as a substitute for *Dr. Griffith's Tonic Mixture*, and by which name it is still commonly known, is one of the best and most generally employed of the pharmaceutical preparations of iron. Its operation is stimulant as well as tonic, and, consequently, it should not be administered in cases where there is any tendency to inflammatory action in the digestive organs; the dose is fʒj. or fʒij., two or three times a day. As it does not keep well, it should be only prepared when wanted for use.—*Pilulæ Ferri comp.*, D. L. (Myrrh, powdered, ʒij.; carbonate of soda, sulphate of iron, and raw sugar (treacle, L.), of each, ʒi.; rub the myrrh with the carbonate of soda; then add the sulphate of iron (and the sugar, D.), and make into a mass with treacle [rub them again; afterward beat the whole, in a vessel previously warmed, until incorporated, L.].) Dose, gr. x. to. gr. xx., two or three times a day. Those pills become so hard when kept as to be unfit for use.

Incomp.—Acids and acidulous salts, and all astringent vegetable preparations.

Ferri citras. *Citrate of Iron.*

Ferri ammonio-citras. *Ammonio-citrate of Iron.*

P. P.—Both those preparations are met with in the shops, and have been recently much employed in medicine, although not contained in any of the pharmacopœias. They occur in the form of semi-transparent, shining scales, of a garnet-red colour, inodorous; the citrate has a styptic, metallic taste, and the ammonio-citrate has a similar, but much milder taste.

C. P.—Citrate of iron is permanent in the air; it is very slightly soluble in cold water, but dissolves readily in boiling water; the solution reddens litmus paper strongly. The ammonio-citrate is a very deliquescent salt; it dissolves readily in cold or boiling water; it is neutral to test paper.

Prep.—Citrate of iron. "Crystallized citric acid, ʒiv.; distilled water, fʒiv.; moist hydrated peroxyde of iron, about fʒviij.; dissolve the acid in the water in a glass matrass with the aid of heat, and saturate the solution, while boiling, with the oxyde of iron, adding rather more of the oxyde than the acid will dissolve. When cold, filter the solution, and make the quantity fʒxvj. This solution spread out on glass will speedily dry, and separate itself from the glass in thin plates."—Ammonio-citrate of iron. "Add to the solution of the citrate, prepared as above, sufficient ammonia to neutralize the excess of acid, and evaporate with a gentle heat to dryness."—Beral.

Th. E.—The citrates of iron resemble much the tartrate before described, and are adapted for the same cases. The ammonio-citrate should be preferred to the simple citrate, in consequence of its greater solubility.

D. & M. of Adm.—Gr. v. to gr. viij.; the ammonio-citrate should be always given in solution. By combining together 4 parts of citrate of iron and 1 of citrate of quina, a preparation is obtained which has been named *Ferri et Quinæ Citras;* it may be given in doses of from gr. iij. to. vj., in the form of pill, in cases where a combination of these tonics is indicated.—*Aqua Chalybeata.* Under this name, a solution of citrate of iron in water, charged with carbonic acid and flavoured with bitter orange peel, has been introduced to the notice of the profession by Messrs. Bewley and Evans, of Dublin. The exact formula for its preparation has not been made public; every fʒvj. hold in solution gr. xiij. of citrate of iron; it may therefore be given in doses of fʒij., two or three times a day. It is the most agreeable form, perhaps, in which a ferruginous preparation can be administered, and in the trials which have been as yet made with it, it has proved very efficacious.—*Tinctura Ferri Aurantiacea,* Wirtemberg. (Iron filings, ʒiv.; Seville oranges, 4. Remove the peel, the white, and the seeds; beat the pulp with the filings in a stone mortar, and let the paste remain at rest for two days; then pour upon it, Madeira wine, fʒx., and tincture of orange peel, fʒij.; digest for 7 days, express, and filter.) A very agreeable preparation. Dose, fʒj. to fʒiv.

Incomp.—The mineral acids, and all astringent vegetable preparations.

Ferri cyanuretum, *Anglicè* Prussian Blue, D. Ferri percyanidum, L. [Ferri ferrocyanuretum. *Ferrocyanuret of Iron,*

U. S. P.] *Percyanide of Iron. Prussian Blue.*—This substance was introduced into the Materia Medica of the Dublin and London Pharmacopœias solely as being employed for preparing bicyanide of mercury. It has, however, been employed in America in the treatment of intermittent and remittent fevers, and in dysentery, for which it is stated to have proved a very effectual remedy. It has also been employed in Germany with success in some cases of old-standing epilepsy. But, according to more recent observations, it appears to possess very little, if any, therapeutical powers. The dose in which it has been administered is from gr. iij. to gr. vj., three or four times a day.

[U. S. P.—*Ferrocyanuret of Iron.* Take of sulphate of iron, 4 oz.; sulphuric acid, 3½ fluid drachms; nitric acid, 6 fluid drachms, vel q. s.; ferrocyanuret of potassium, 4½ oz.; water, 2 pints. Dissolve the sulphate of iron in a pint of the water, and having added the sulphuric acid, boil the solution. Pour into it the nitric acid, in small portions, boiling the liquid for a minute or two after each addition, until it no longer produces a dark colour; then allow the liquid to cool. Dissolve the ferrocyanuret of potassium in the remainder of the water, and add this solution gradually to the first liquid, agitating the mixture after each addition; then pour it upon a filter. Wash the precipitate with boiling water until the washings pass tasteless. Lastly, dry it and rub it into powder.]

Ferri iodidum, L. E. *Iodide of Iron. Proto-iodide of Iron.*

P. P.—Generally met with in small crystalline masses, of an iron-gray colour, opaque, and having a metallic lustre. It has a very styptic, metallic taste.

C. P.—Iodide of iron is composed 1 eq. of iodine and 1 of iron (FeI), combined in the crystalline state with 5 eq. of water. It is very deliquescent, and attracting oxygen from the air, is converted into a mixture of peroxyde and periodide of iron; it dissolves readily in water and alcohol, but the solution, when left exposed to the air, is rapidly decomposed, and peroxyde of iron deposited. Exposed to heat it fuses, and at a temperature above 350° F. it is decomposed, the iodine being volatilized, and the iron left in the state of peroxyde.

Prep.—*Lond.* "Iodine, ʒvj.; iron filings, ʒij.; distilled water, Oivss.; mix the iodine with Oiv. of the water, and to these add the iron. Heat them in a sand-bath, and when it has acquired a greenish colour, pour off the liquor. Wash what remains with the half pint of water, boiling. Let the mixed and strained liquors evaporate at a heat not exceeding 212° in an iron vessel, that the salt may be dried. Keep it in a well-stopped vessel, access of light being prevented." *Edin.* "Take any convenient quantity of iodine, iron-wire, and distilled water, in the proportions for making sirup of iodide of iron (*see below*). Proceed as directed for that process; but, before filtering the solution, concentrate it to one sixth of its volume, without removing the excess of iron-wire. Put the filtered liquor quickly into an evaporating basin, with twelve times its weight of quicklime around the basin, in some convenient apparatus in which it may be shut up accurately in a small space not communicating with the general atmosphere. Heat the whole apparatus in a hot-air press, or otherwise, until the water be entirely evaporated, and preserve the dry iodide in small well-closed bottles."—Ferri iodidi sirupus, E. "Iodine (dry), 200 grains; fine iron-wire, recently cleaned, 100 grains; white sugar, in powder, ʒivss.; distill-

ed water, f℥vj.; boil the iodine, iron, and water together in a glass matrass, at first gently, to avoid the expulsion of iodine vapour, afterward briskly, till about f℥ij. remain. Filter this quickly, while hot, into a matrass containing the sugar; dissolve the sugar with a gentle heat, and add distilled water to make up f℥vj. Twelve minims contain one grain of iodide of iron."

[U. S. P.—*Solution of Iodide of Iron.* Liquor ferri iodidi. Take of iodine, 2 oz.; iron filings, 1 oz.; prepared honey, 5 fluid ounces; distilled water, q. s. Mix the iodine with 10 fluid ounces of the water, in a porcelain or glass vessel, and gradually add the iron filings, stirring constantly. Heat the mixture gently until the liquor acquires a light greenish colour; then, having added the honey, continue the heat a short time, and filter. Lastly, pour distilled water upon the filter, and allow it to pass until the whole of the filtered liquor measures 20 fluid ounces. Keep the solution in closely-stopped bottles.

Dr. Dupasquier, professor of chemistry and pharmacy in, and physician to, the Hôtel Dieu of Lyons, has published in the Journal de Pharmacie of Paris, March, 1841, a memoir on the proto-ioduret of iron and its preparation, which he says he has for some time employed, with remarkable success, in the treatment of phthisis pulmonalis. It has been found in this country exceedingly useful, besides tubercular phthisis, in chlorosis, in spinal and other affections produced by an alteration of the organism.

It is an essential condition of its success that the proto-ioduret of iron be perfectly neutral and colourless. The formula for making what the inventor calls "*the normal solution of the proto-ioduret of iron*" is as follows:

Iodine, 10 grammes	(ʒiiss.)
Iron filings, 20 grammes	(ʒv.).
Distilled water, 80 grammes	(ʒxx.).

Introduce the whole into a small matrass, and keep it plunged for ten minutes, heated to 70 or 80° centigrade (126° to 144° F.), shaking the mixture at intervals, and until the brown colour is entirely gone. The preparation in that state does not keep. It must be immediately made into sirup or pills thus:

Sirup of the Proto-iodide of Iron.

℞ Sal. normal. protiod. ferri	ʒi.
Sirup gum (colourless and very thick)	ʒviss.
Sirup of orange flower " "	ʒx.

Mix accurately, by agitation for a few minutes. A dessert spoonful contains about four drops of the solution.

Pills of Proto-ioduret of Iron.

℞ Iodine	ʒij.
Iron filings	ʒiv.
Distilled water	ʒivss.

Prepare it like the normal solution, pour it into a clean iron vessel, and add white honey, ʒv.; evaporate it till the disappearance of a large portion of the water of the proto-ioduret of iron, or until the mixture acquires the density of a fluid sirup: then add little by little, continually agitating the sirup with a spatula, ʒiij. of gum tragacanth, in powder. Divide then the mass in 200 pills, each of which represents about four drops of the normal solution.

Officinal solution of Proto-iodide of Iron, used as a substitute for the preparation of Dupasquier, and preferable, in view of its proportions being more conformable to the chemical relations of the articles, and more conveniently stated in decimals:

℞	17	parts pure iodine.
	8	" iron filings.
	80	" distilled water.
	110	" white sugar.
	16	" powdered gum-arabic.

Mix the iodine with ¾ of the water, add the filings gradually, constantly agitating the mixture; hold it over a spirit lamp until the mixture becomes nearly colourless. Filter over an iron cup containing sugar, wash the filter with the remainder of the water, dissolve the gum in it, mix the whole together, and reduce 100 grs. The quantity of pure iodide of iron will be one tenth. For the *Sirup of Iodide of Iron*, take 2 parts of the above officinal solution, 22 parts of simple sirup, and 6 parts of sirup of orange flowers. This is 4 times the strength of Dupasquier's. The latter contains 1 grain of the salt to the drachm.]

Adulterations.—That iodide of iron has been well prepared and

properly preserved, may be readily known by its being entirely soluble in distilled water.

Th. E.—Iodine of iron was first employed in the practice of medicine by Dr. A. T. Thomson, of London. In its operation on the system it is more nearly allied to the preparations of iron than to those of iodine, but to a certain extent it possesses the combined properties of both. Thus, as a tonic it has been found especially useful in scrofulous debility, and under its use strumous enlargements of the glandular system have been dissipated. It has been also administered with much benefit in chlorosis and amenorrhœa when the ferruginous preparations are indicated, and in the secondary syphilitic affections occurring in debilitated and scrofulous subjects. In large doses, iodide of iron sometimes purges.

D. & M. of Adm.—The dose of iodide of iron is gr. ij. to gr. v., gradually increased. It is so deliquescent a substance, and the solution of it decomposes so rapidly, that many methods have been proposed for preserving it unchanged in the form of solution; of these, the only two that deserve notice are, keeping in the bottle in which it is contained a piece of iron wire, as first proposed by Mr. Squire, of London, or forming it into a strong sirup, as recommended by Dr. A. T. Thomson. The former method has been found very effectual, but it entails the necessity of filtering the solution every time it is to be used; while in the latter it is not only preserved for a length of time unaltered, but it is also an elegant form for the administration of the medicine. The sirup of the Edinburgh Pharmacopœia may be given in doses of from min. xv. to min. lx., simply dissolved in water.

Incomp.—All substances incompatible with sulphate of iron. (See page 66.)

Ferri lactas. *Lactate of Iron. Proto-lactate of Iron.*

P. P.—It occurs in the form of small, greenish-yellow, acicular prisms, or in powder of a dull-pale green colour, having a feeble, chalybeate, not disagreeable taste.

C. P.—It is composed of 1 eq. of protoxyde of iron and 1 of lactic acid, combined in the crystalline state with 3 of water. It is but slightly soluble in water, and during solution the iron passes to a higher state of oxydation. Proto-lactate of iron has an acid reaction on vegetable colours.

Prep.—"Take any quantity of sour whey; evaporate it to a third or a fourth of its volume; decant, filter, and saturate with milk of lime. Separate the precipitated lactate of lime in a filter; treat it with solution of oxalic acid, to precipitate the oxalate of lime. Add to the liquor, again filtered (which is now a solution of lactic acid), clean iron filings; boil for a short time, filter, evaporate to the consistence of a sirup, and crystallize by cooling."—Louradour.

Th. E.—Lactate of iron has been administered in the same cases as the other mild preparations of this metal. It has been principally employed in the treatment of chlorosis and atonic amenorrhœa, in which it has been found very successful.

D. & M. of Adm.—Gr. vj. to gr. xij. in the 24 hours. It is best given in the form of lozenge or of sirup.—*Trochisci Ferri Lactatis,*

Cap. (Lactate of iron, ʒvij., gr. lxxij.; pure sugar, ℥xiss.; mucilage, q. s.; make into lozenges, each weighing gr. x.) Each lozenge contains gr. ¾ of the salt.—*Sirupus Ferri Lactatis*, Cap. (Lactate of iron, ʒi.; boiling distilled water, f℥viss.; pure sugar, ℥xiij.; make into a sirup.) Dose, fʒij. to f℥ss.

Incomp.—Same as for citrate of iron.

Ferri mistura aromatica, D. *Aromatic mixture of Iron.*

Prep.—"Pale cinchona bark, in coarse powder, ℥i.; colomba root, sliced, ʒiij; cloves, bruised, ʒij.; iron filings, ℥ss.; digest for 3 days in a close vessel with frequent agitation, with sufficient peppermint water to afford ℥xij. of strained liquor; then add, compound tincture of cardamoms, ℥iij.; and tincture of orange peel, ʒiij."

This mixture is a combination of aromatic tonics, holding in solution some tannate of iron; in consequence of its black colour, it is commonly known as *Heberden's ink*. Notwithstanding its being an unchemical compound, it is a most excellent tonic, in very general use in Dublin, in the various states of debility attended with anœmia. Dose, f℥i. to f℥ij., two or three times a day.

Ferri muriatis tinctura, E. Muriatis ferri liquor, D. Tinctura ferri sesquichloridi, L. [Tinctura ferri chloridi, U. S. P. *Tincture of chloride of Iron.*] *Tincture of the muriate of Iron. Tincture of the sesquichloride of Iron.*

P. & C. P.—This preparation is transparent, and of a reddish-brown colour; it has a rather agreeable odour of muriatic ether, and a very acid, styptic taste. It is a solution of perchloride of iron in rectified spirit, containing also free muriatic acid, and a trace of muriatic ether. It reddens litmus paper strongly. According to Mr. Phillips, when prepared according to the London formula, its sp. gr. is about 992, and f℥i. yields by decomposition nearly gr. xxx. of peroxyde of iron.

Prep.—*Dub.* "Rust of iron, 1 part; muriatic acid and rectified spirit, of each, 6 parts; pour the acid on the rust of iron put into a glass vessel, agitate frequently for 3 days, set aside that the dregs may subside, and pour off the clear liquor; reduce this by slow evaporation to a third, and add the spirit to it when cold." *Lond.*, *Edin.* "Sesquioxyde (red oxyde, E.) of iron, ℥vj.; hydrochloric (muriatic, E.) acid, Oj.; rectified spirit, Oiij.; digest the oxyde in the acid for three days in a glass vessel, with occasional agitation; then add the spirit, and filter."

Th. E.—Tincture of the muriate of iron, principally in consequence of the free muriatic acid which it contains, if taken in large doses, acts as an irritant poison. In medicinal doses it is one of the most generally employed of the officinal preparations of iron, and may be used as a tonic in the cases in which they are indicated. It should be borne in mind, however, that it possesses astringent properties (on which account it is sometimes used as a topical agent to check bleeding from small vessels), and also that it is more irritant than the other preparations of the metal. Besides its tonic powers, it possesses some specific influence over the uninary organs, in many diseases of which it is employed with benefit. Thus, it is found useful in irritability of the bladder, especially when occurring in females, in chronic mucous discharges from the urino-genital

organs, in atonic nemorrhages from the kidneys and bladder, and in spasmodic stricture of the urethra preventing the introduction of a catheter. In the latter affection, its beneficial effects are generally ascribed to the nausea which it produces, and, consequently, it is administered in small but frequently-repeated doses, min. x. to min. xij., every 10 or 15 minutes.

D. & M. of Adm.—Min. x. to f℥ss., gradually increased to f℥j. or f℥ij.; it is best administered in f℥i. or f℥ij. of water, or in white wine, if nothing forbids the use of the latter.

Incomp.—The alkalies and their carbonates; lime-water; carbonate of lime; magnesia and its carbonate; solution of gum; and all astringent vegetable preparations.

In poisoning with this preparation, the treatment is the same as in poisoning with muriatic acid. (See page 130.)

Ferri oxydum nigrum, D. E. *Black oxyde of Iron. Ferroso-ferric-oxyde of Iron.*

P. P.—This compound is met with native, when it constitutes *magnetic* iron ore. Prepared according to the Edinburgh Pharmacopœia, it is a grayish-black powder, with a velvety smoothness; the Dublin preparation is of a richer black colour. Both are strongly magnetic.

C. P.—The oxyde of the Edinburgh College is a compound of 1 eq. of the protoxyde and 2 of the peroxyde of iron ($FeO, 2\,Fe^2O^3$); that of Dublin, 5 of the protoxyde and 2 of the peroxyde (Mosander). Exposed to heat in close vessels, they undergo no alteration; but when heated in the open air they absorb oxygen, and pass into the state of peroxyde. They dissolve readily in muriatic acid, without effervescence.

Prep.—*Dub.* "Wash with water, and dry the scales of oxyde of iron which are found at the smiths' anvils, then remove them from impurities by means of a magnet. Reduce to powder, and separate the finer particles in the manner directed for prepared chalk." *Edin.* "Sulphate of iron, ℥vj.; sulphuric acid (commercial), f℥ij., f℥ij.; pure nitric acid, f℥ivss.; boiling water, Oiij.; dissolve half the sulphate in half the water, and add the sulphuric acid; boil, add the nitric acid by degrees, boiling the liquid briskly after each addition for a few minutes. Dissolve the rest of the sulphate in the rest of the water, mix thoroughly the two solutions, and immediately add the ammonia in a full stream, stirring the mixture at the same time briskly. Collect the black powder on a calico filter, wash it with water till the water is scarcely precipitated by solution of nitrate of baryta, and dry it at a temperature not exceeding 180°."

Adulterations.—Black oxyde of iron sometimes contains metallic iron, when it does not dissolve completely in muriatic acid.

Th. E.—This preparation of iron is not much used in the present day, but formerly, under the name of *Æthiops martis*, it bore a high reputation as a chalybeate tonic. The dose of it is from gr. v. to gr. xx., two or three times a day, made into an electuary with honey or treacle.

Ferri oxydum rubrum, E. Ferri sesquioxydum, L. Ferri carbonas, D. *Peroxyde of Iron (by precipitation). Sesquioxyde of Iron.*

Ferri oxydum rubrum, D. *Peroxyde of Iron (prepared by decomposing the sulphate by heat), Colcothar.*

P. P.—As obtained by precipitation, peroxyde of iron is at first of a light reddish-brown colour, but becomes dark brown when dried; prepared by decomposing the sulphate, its colour is reddish chocolate brown. Both are tasteless and odourless.

C. P.—Peroxyde of iron is composed of 2 eq. of iron, and 3 of oxygen (Fe^2O^3). The precipitated oxyde contains a trace of carbonic acid unless a heat above 140° be employed in drying it, whence it was formerly termed *carbonate* or *subcarbonate* of iron; and this nomenclature is still retained in the Dublin Pharmacopœia. It is insoluble in water, and is not readily dissolved by any acid except the muriatic, in which it dissolves freely, and if it be free from carbonic acid, without effervescence.

Prep.—Ferri carbonas, D. "Sulphate of iron, 25 parts; carbonate of soda, 26 parts; water, 800 parts; dissolve the sulphate of iron in the water, then add the carbonate of soda, previously dissolved in a sufficiency of water, and mix. Wash the precipitated carbonate of iron with warm water, and dry it."—Ferri sesquioxydum, L. "Sulphate of iron, ℔iv.; carbonate of soda, ℔iv., ʒij.; boiling water, cong. vj.; dissolve the sulphate of iron and carbonate of soda separately in cong. iij. of water; then, the liquors being mixed together, set them by that the powder may subside. Lastly, the supernatant liquor being poured off, wash what is precipitated with water, and dry it."—Ferri oxydum rubrum, E. "Sulphate of iron, ʒiv.; carbonate of soda, ʒv.; boiling water, Oss.; cold water, Oiiiss.; dissolve the sulphate in the boiling water, add the cold water, and then the carbonate of soda, previously dissolved in about thrice its weight of water. Collect the precipitate on a calico filter, wash it with water till the water is but little affected by solution of nitrate of baryta, and dry it in the hot-air press or over the vapour-bath."—Ferri oxydum rubrum, D. "Expose the sulphate of iron to heat until the water of crystallization shall be expelled, then roast it with a strong fire as long as it gives off acid vapours. Wash the product till the washings no longer redden litmus, and, lastly, dry it on bibulous paper."

Adulterations.—If it contain any earthy impurity, as brickdust, it will not be completely soluble in muriatic acid, aided by a gentle heat.

Th. E.—Peroxyde of iron may be used as a chalybeate tonic in the same cases as the other ferruginous preparations. Its principal use, however, is in the treatment of neuralgic affections, particularly tic douloureux, as a remedy for which it was first proposed, under the old name of *Carbonate*, by Mr. Hutchinson. In many instances it will be found to give complete relief, but it frequently fails to prove of the least service. Mr. Carmichael, of Dublin, has found this preparation a useful palliative in cancerous diseases.

D. & M. of Adm.—The peroxyde of iron is administered in doses of from ʒss. to ʒiv., three or four times a day. It may be given in the form of electuary made with honey, and some aromatic powder combined with it.—*Emplastrum Thuris*, D. (Litharge plaster, ℔ij.; frankincense, ℔ss.; red oxyde of iron, ʒiij.; melt the plaster and frankincense together, sprinkle in the oxyde, stirring at the same time, and make a plaster.)—*Emplastrum Ferri*, E. (Litharge plaster, ʒiij.; resin, ʒvj.; olive oil, fʒiiiss.; red oxyde of iron, ʒi.; triturate the oxyde of iron with the oil, and add the mixture to the

other articles, previously melted with a gentle heat; mix the whole thoroughly.) Those plasters are employed spread on leather, to give mechanical support in muscular relaxations and weakness of the joints; by some they are believed to be tonic.

INCOMP.—The mineral acids, and acidulous salts.

[FERRI PHOSPHAS, U. S. P. *Phosphate of Iron.*

Take of sulphate of iron, 5 oz.; phosphate of soda, 6 oz.; water, a gallon. Dissolve the iron and the soda severally in 4 pints of the water; then mix the solutions, and set the mixture by, that the powder may subside; lastly, having poured off the supernatant liquor, wash the phosphate of iron with hot water, and dry it with a gentle heat. Dose, 5 to 10 grains.]

FERRI SULPHAS.—*Sulphate of Iron* (described in the division *Astringents*) is an excellent tonic, and is employed with much benefit in the same cases as the other ferruginous compounds, provided its astringent property does not contra-indicate its use.

FERRI TARTRAS. *Tartrate of Iron.*

The preparation often met with in the shops under this name is the *ammonio-tartrate* described before. In former editions of the British Pharmacopœias a wine of iron, *Vinum Ferri*, was contained, and it is still frequently prescribed; it may be prepared as follows; "Take of clean iron-wire, cut in pieces, ʒiv.; Rhenish wine, Oiv.; sprinkle the iron with a little of the wine, and expose it to the air till it is covered with rust; then add the rest of the wine, digest it for 8 days, shaking the vessel occasionally, and filter." The dose is from ſ3i. to fʒss.

FERRUGO, E. *Hydrated Sesquioxyde of Iron.*

FERRI RUBIGO, D. *Rust of Iron.*

[FERRI OXYDUM HYDRATUM, U. S. P. *Hydrated Oxyde of Iron.*]

Those preparations are very nearly similar in chemical composition, but as rust of iron is not used in medicine in the present day, I shall confine the following observations to the Edinburgh preparation.

P. & C. P.—The hydrated sesquioxyde of iron is in the form of a yellowish-brown powder, inodorous and tasteless. It is composed of 1 eq. of per- (sesqui-) oxyde of iron and 2 of water (Fe^2O^3+2HO). It is insoluble in water, but dissolves readily in dilute acids; heated, it gives off water and a little ammonia, and the red peroxyde of iron is left. If, in the moist state, the hydrated sesquioxyde of iron in considerable excess (*at least* 12 *parts of oxyde to* 1 *part of arsenic*, Dr. Maclagan) be agitated with a solution containing arsenious acid, a very insoluble compound (*arseniate of protoxyde of iron*, Graham) is formed, and the filtered liquor gives no trace of arsenious acid.

PREP.—FERRI RUBIGO, D. "Iron-wire, broken into fragments, any quantity; moisten with water, and expose to the air until they are corroded into rust. Tritu-

rate it in a mortar, and, by affusion with water, wash out the finer powder, which is to be dried."—Ferrugo, E. "Sulphate of iron, ʒiv.; sulphuric acid (commercial), fʒiiiss; nitric acid, dens. 1380, fʒix.; stronger aqua ammoniæ, fʒiiiss.; water, Oij.; dissolve the sulphate in the water, add the sulphuric acid, and boil the solution; add then the nitric acid in small portions, boiling the liquid for a minute or two after each addition, until it acquires a yellowish-brown colour and yields a precipitate of the same colour to ammonia. Filter; let the liquid cool; and add in a full stream the aqua ammoniæ, stirring the mixture briskly. Collect the precipitate on a calico filter, wash it with water till the washings cease to precipitate with nitrate of baryta; squeeze out the water as much as possible; and dry the precipitate at a temperature not above 180°. When this preparation is kept as an antidote for poisoning with arsenic, it is preferable to preserve it in the moist state after being simply squeezed."

A hydrated peroxyde of iron may be also readily prepared by precipitating the tincture of the muriate with ammonia.

Th. E.—In its medicinal properties, this preparation is precisely similar to the dry peroxyde. It has been advisedly introduced into the last edition of the Edinburgh Pharmacopœia, as being the most certain antidote for poisoning with arsenic which has yet been discovered. Its antidotal powers are now well established by the result of numerous cases in which it has proved successful within the last ten years, both in Great Britain and on the Continent. The quantity required to neutralize the poisonous property of arsenic, as above remarked, is at least 12 parts to 1 of the poison, but it should be always given in as large doses as the stomach will bear. Thus, a tablespoonful may be mixed with water, and this quantity administered every five or ten minutes. Hydrated peroxyde of iron does not prove near so efficacious an antidote when dried as when kept in the form of a moist magma.

Ferrum tartarizatum, E. Ferri tartarum, D. Ferri potassio-tartras, L. *Tartrate of Iron and Potash. Potassio-tartrate of Iron.*

P. P.—This salt occurs in the form of a grayish-brown powder, with a greenish tint; it is inodorous, but has a somewhat styptic, not disagreeable taste.

C. P.—It is composed of 1 eq. of tartrate of potash, and 1 eq. of tartrate of sesquioxyde of iron (Phillips). It deliquesces slightly in damp air, is very soluble in water, requiring about 4 parts of cold water for its solution, and is slightly soluble in alcohol. The solution is of a greenish-yellow colour; it is not decomposed by the alkalies or alkaline carbonates, unless with the aid of heat; and it will retain its composition unchanged for a considerable time.

Prep.—*Dub.* "Thin iron-wire, 1 part; bitartrate of potash, in fine powder, 4 parts; distilled water, 8 parts, or a sufficiency; mix them together, and expose to the air in an open vessel for 15 days, agitating frequently, and adding water daily, so as to keep the mixture moist, but taking care not to cover the iron completely with water. Finally, boil with a sufficient quantity of distilled water, evaporate the filtered liquor to dryness in a vapour-bath, and keep the tartar of iron in well-closed vessels." *Lond.* "Sesquioxyde of iron, ʒiij.; hydrochloric acid, Oss.; solution of potash, Oivss., or a sufficiency; bitartrate of potash, ʒxiss.; solution of sesquicarbonate of ammonia, Oj., or a sufficiency; distilled water, cong. iij.; mix the sesquioxyde of iron with the acid, and digest for 2 hours in a sand-bath. Add to these two gallons of the water, and set aside for an hour; then pour off the supernatant liquor. The solution of potash being added, wash what is precipitated frequently with water, and while moist boil it with the bitartrate of potash, previously mixed

with a gallon of the water. If the liquor should be acid when tried by litmus, drop into it solution of sesquicarbonate of ammonia until it is saturated. Lastly, strain the liquor, and with a gentle heat let it evaporate, so that the salt may remain dry." *Edin.* "Sulphate of iron, ℥v.; bitartrate of potash, ℥v., ʒi.; carbonate of ammonia, in fine powder, a sufficiency. Prepare rust of iron from the sulphate as directed for *Ferrugo*, and without drying it. Mix the pulpy mass with Oiv. of water; add the bitartrate; boil till the rust of iron is dissolved; let the solution cool; pour off the clear liquid, and add to this the carbonate of ammonia so long as it occasions effervescence. Concentrate the liquid over the vapour-bath to the consistence of thin extract, or till the residuum becomes, on cooling, a firm solid, which must be preserved in well-closed vessels."

Adulterations.—As met with in the shops, tartrate of iron and potash is often imperfectly prepared, the oxyde of iron not being chemically combined with the bitartrate of potash. The tests of the *Edin. Phar.* will detect this as well as other faults which are likely to occur in the preparation: "Entirely soluble in cold water; taste feebly chalybeate; the solution is not altered by aqua potassæ, and is not precipitated by solution of ferrocyanide of potassium." I have in several instances met with specimens of this salt which contained carbonate of potash; they were exceedingly deliquescent, and effervesced with dilute acids.

Th. E.—This is a mild chalybeate tonic, and may be used in all cases where the milder preparations of iron are indicated. In consequence of its taste, it is well adapted for children.

D. & M. of Adm.—Gr. v. to gr. xx., made into a bolus with honey or treacle, or dissolved in some aromatic water.

Incomp.—The mineral acids; lime-water; and all astringent vegetable preparations.

Gentiana, L. E. Gentiana lutea, radix, D. *Gentian. Root of Gentiana lutea.*—A native of the mountainous regions of Central Europe, belonging to the natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—Root perennial; stem annual, simple, erect, 3 to 4 feet high, roundish, hollow; leaves opposite, broad, ovate, 5 to 7 nerved, plaited; flowers yellow, whorled, numerous, on smooth peduncles; fruit, a conical capsule, two-valved, many-seeded.

P. P.—Gentian root is imported in bales from Switzerland, by way of Havre, Marseilles, &c. It is in pieces varying in length from two or three to eight or ten inches, and from half an inch to one or two inches in thickness, usually contorted and much branched; the epidermis is wrinkled and somewhat annulated, of a brownish-yellow colour; internally the root is of a bright yellow colour, and has a spongy texture. It has a faint, aromatic odour, which in the fresh state is said to be strong and disagreeable, and an intensely bitter taste, void of all astringency.

C. P.—Gentian consists of odorous volatile oil, a yellow crystallizable bitter neutral principle (*gentianin* of MM. Henry and Caventou, but which, according to Leconte and Trommsdorf, is a compound of simple colouring matter, not bitter (*gentisin*), a bitter principle (*gentianite*), and fatty matter), a matter identical with bird-lime, green fixed oily matter, a free organic acid, uncrystallizable sugar, gum, yellow colouring matter, and lignin. Gentian

imparts its active principles readily to cold or boiling water, alcohol, and ether.

Adulterations.—The roots of other species of gentian are frequently mixed with those of *Gentiana lutea*, an adulteration of little importance, as for the most part they possess analogous properties. A more serious fraud has, however, been sometimes practised, that of mixing the roots of belladonna, monkshood, or white hellebore with gentian; they may be readily detected, as they do not possess either the intense bitter taste or the bright-yellow colour internally of gentian root.

Th. E.—Gentian is an excellent pure bitter tonic, and is one of the most generally employed of this class of medicines. In large doses it often causes vomiting, and it has a tendency to relax the bowels. The diseases in which gentian is employed with most benefit are those forms of dyspepsia attended with torpid digestion and secretion of acid, but unaccompanied with any tendency to irritability or inflammation of the stomach. It is also a useful tonic in the debility attendant on chronic diseases; and, in consequence of its bitterness, it proves anthelmintic.

D. & M. of Adm.—In powder, seldom used, gr. x. to gr. xxx.; as gentian possesses little if any aroma, aromatics are usually prescribed in combination with it.—*Infusum Gentianæ comp.*, D. L. *Infusum Gentianæ*, E. ("Gentian, sliced; orange peel, dried, of each, ʒi. (ʒij., L.); lemon peel, fresh, ʒi. (ʒiv., L.); boiling (distilled, L.) water, ℥xij. (Oj., L.). Digest (macerate, L.) for an hour in a covered vessel, and strain," D. L. "Gentian, sliced, ℥ss.; bitter orange peel, dried and bruised, ʒj.; coriander, bruised, ʒi.; proof spirit, f℥iv.; cold water, f℥xvj.; pour the spirit on the solids; in three hours add the water; in 12 hours more strain through linen or calico," E.) The Edinburgh preparation keeps best, but in many cases the spirit it contains will render its use objectionable. The infusion of the Dublin and London Colleges soon spoils by keeping, therefore it should be only prepared when required for use. Dose, f℥i. to f℥ij.; it is an excellent vehicle for the alkaline bicarbonates. —*Mistura Gentianæ comp.*, L. (Compound infusion of gentian, f℥xij.; compound infusion of senna, f℥vj.; compound tincture of cardamom, f℥ij.; mix.) An excellent cathartic in constipation attended with debility of the digestive organs. Dose, f℥j. to f℥ij.—*Tinctura Gentianæ comp.*, D. L. E. ("Gentian, sliced (and bruised, D.), ℥ij. (℥iiss., L.); orange peel, dried, ℥i. (ʒx., L.); cardamom seeds (without the capsules, D.; bruised, L.), ℥ss. (ʒv., L.); proof spirit, *by measure*, ℔ij. (Oij., L.); macerate for 14 days, and strain," D. L. "Gentian, sliced and bruised, ℥ij.; dried bitter orange peel, bruised, ℥i.; canella, in moderately fine powder, ℥ss.; cochineal, bruised, ʒss.; proof spirit, Oj.; digest for 7 days, strain, and express strongly; and then filter the liquor. This tincture may be more conveniently prepared by percolation, as directed for the compound tincture of cardamom," E.) Dose, fʒi. to fʒj., generally used as an adjunct to the infusion.—*Tinctura Rhei et Gentianæ*, E. (Rhubarb, in moderately fine powder, ℥ij.; gentian, finely cut or in

coarse powder, ʒss.; proof spirit, Oij.; mix the powders, and proceed as for tincture of cinchona.) Stomachic and tonic, with mild laxative properties. Dose, fʒi. to fʒii.—*Vinum Gentianæ comp.*, E. (Gentian, in coarse powder, ʒss.; yellow bark, in coarse powder, ʒi.; bitter orange peel, dried and sliced, ʒij.; canella, in coarse powder, ʒi.; proof spirit, fʒivss.; sherry, fʒxxxvj.; digest the root and bark for 24 hours in the spirit; add the wine, and digest for 7 days more; strain and express the residue strongly, and filter the liquors.) An excellent stomachic and tonic. Dose, fʒss. to fʒj.—*Extractum Gentianæ*, D. L. E. ("Prepared, as the other *simple* extracts, as follows: Boil the root in eight times its weight of water down to one half; then express the liquor, and when the fæces have subsided, filter; evaporate with a *superior* heat till it begins to thicken, and finally inspissate it, with a *medium* heat obtained by means of the vapour of boiling water, frequently stirring it, until it acquires a consistence adapted to the formation of pills," D. "Gentian, sliced, ℔iiss.; boiling distilled water, cong. ij.; macerate for 24 hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence," L. "Gentian, any convenient quantity; bruise it to a moderately fine powder; mix it thoroughly with half its weight of distilled water; in 12 hours put it into a percolator, and exhaust it by percolation with temperate distilled water. Concentrate the liquid; filter it before it becomes too thick; and evaporate in the vapour-bath to the due consistence," E.) An excellent tonic extract. Dose, gr. x. to ʒss., two or three times a day, in the form of pill; in this state it may be prescribed with the preparations of iron.

Incomp.—Solution of diacetate of lead; nitrate of silver; sulphate of iron; and analogous salts.

Menyanthes, L. E. Menyanthes trifoliata, folia, D. *The common Buckbean. Leaves of Menyanthes trifoliata.*—An indigenous plant, growing plentifully in marshy places, belonging to the natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

B. C.—Roots densely creeping, and matted; leaves ternate, stalked; leaflets obovate, obscurely toothed; flower-stalk simple, from 5 to 8 inches high, bearing a compound raceme of many white flowers, tipped externally with red, and beautifully fringed with white filaments within.

The whole of this plant possesses a bitter taste, which it retains when dried; it contains bitter extractive, green colouring matter, albumen, starch, and a trace of tannic acid. Buckbean is a tonic of some power, and may be used as an indigenous substitute for gentian. The dose of the dried leaves in powder is from gr. x. to ʒss.; or of an infusion (prepared with ʒi. of the dried leaves and Oj. of boiling water), fʒi. to fʒj. An extract may be prepared in the same manner as extract of gentian; the dose of it would be from gr. x. to gr. xx.

Incomp.—The sesquisalts of iron; nitrate of silver; and acetate of lead.

Myrrha, D. L. E. *Myrrh. Gum-resin of Balsamodendron Myrrha*, L. *Gummy resinous exudation of Balsamodendron (Protium?) Myrrha*, E.—A native of Gison, on the borders of Arabia Felix, belonging to the natural family *Anacardiaceæ*, and to the Linnæan class and order *Octandria Monogynia.*

B. C.—An arborescent shrub, with a pale ash-gray bark, and spinescent branches; leaves ternate, on short footstalks; flowers, unknown; fruit somewhat larger than a pea, ovate, acuminate, brown.

Prep.—Myrrh exudes from the tree like cherry-tree gum; it is at first of the consistence of oil, but soon becomes hard and darker-coloured. It is imported into Britain by way of the East Indies.

P. P.—Myrrh, like the other gums, is met with in commerce of different qualities. The finest, *Turkey Myrrh* (so called because it was formerly imported by way of Turkey), is in irregular-shaped tears or masses, varying in size from that of a pea to that of a chestnut, but pieces are often met with more than twice that size; they are semi-transparent, of a reddish-yellow or reddish-brown colour, the larger pieces being the darker-coloured; their fracture is shining, somewhat fatty, presenting often small white striæ in the centre, particularly of the largest masses. The taste of myrrh is acrid and bitter, the odour agreeable and aromatic; the finer pieces of Turkey myrrh are often selected and sold as picked myrrh. The inferior sorts, *East India myrrh*, are on an average in much smaller tears than Turkey myrrh; some of the tears are almost transparent and of a very pale colour, others are dark brown; they are generally mixed with other gums.

C. P.—Myrrh is composed of 2·5 per cent. of volatile oil, 23 of resin, 46 of soluble gum (*Arabine*), and 12 of insoluble gum (Braconnot). Its medicinal properties depend on the volatile oil and resin, both of which are dissolved out completely by rectified spirit, partially by proof spirit, and very slightly by water; the latter menstruum dissolves all the soluble gum, and forms with it a thicker mucilage than with gum-acacia. By heat myrrh is softened, but does not melt; it is inflammable.

Adulterations.—Myrrh is frequently adulterated with the inferior sorts, and with other gum-resins. The finer pieces of Turkey myrrh should alone be employed in medicine.

Th. E.—Myrrh is a stimulating tonic, and, consequently, is inadmissible in cases where there is any tendency to inflammatory action. It is principally used in debilitated states of the digestive organs, or in diseases attended with excessive secretion from the mucous membranes. It is an excellent addition to alteratives and astringents in the protracted diarrhœas of infancy and childhood. Myrrh was formerly in high esteem as an emmenagogue, but it has completely lost its repute as such.

D. & M. of Adm.—Gr. x. to gr. xxx., in powder, or made into an emulsion with water.—*Tinctura Myrrhæ*, D. L. E. (Myrrh, bruised (in moderately fine powder, E.), ʒiij. (ʒiiiss., E.): rectified spirit, *by measure*, ℔ss. (Oij., L. E.); (proof spirit, *by measure*, ℔iss., D.) "Digest (macerate, L.) for 7 (14, L.) days, and filter," D. L. "Pack the myrrh very gently, without pressure, in a percolator;

then pour on the spirit; and when two pints have passed through, agitate well to dissolve the oleo-resinous matter which first passes, and which lies at the bottom. This tincture is much less conveniently prepared by the process of digestion for 7 days," E.) The dose of this tincture for internal use is from f℥i. to f℥ij. It is most generally employed diluted with water as a lotion in sponginess or ulceration of the gums; it is also used as a stimulant application to foul ulcers. When mixed with water, in consequence of the precipitation of the resin, a milky solution is formed.

Quassia, L. E. Quassia excelsa, lignum, D. *Quassia. The wood of Quassia excelsa*, D. L.—*chiefly of Picræna excelsa, and seldom of Quassia amara*, E.—The *Quassia* or *Picræna excelsa* is a native of Jamaica, belonging to the natural family *Simarubaceæ*, and to the Linnæan class and order *Decandria Monogynia*. The *Quassia amara*, or true quassia-tree, yields none of the quassia at present met with in British commerce; it is a native of the Continent of South America, and of many of the West Indian islands.

B. C.—*Picræna excelsa* is a tall, handsome tree, often attaining a hight of 100 feet; leaves pinnated; flowers small, yellowish-green, in axillary, very compound racemes.

P. P.—Quassia-wood is imported in billets from two to nine inches in diameter, covered with a brittle, reticulated, dark-brown bark. The wood is close, but light, of a pale-yellow colour, odourless, with an intensely bitter taste. The billets are cut into chips for medical use.

C. P.—It is composed of lignin, gummy matter, some salts of lime, a minute trace of volatile oil, and a peculiar, neutral bitter principle, which has been named *quassin* or *quassite*. It yields its bitterness to boiling water and to alcohol.

Adulterations.—Quassia-wood being scarce, other woods which resemble it in appearance are frequently substituted for it. They may be at once detected by their wanting the pure bitter taste of quassia.

Th. E.—Quassia is among the most powerful of the pure bitters, and, consequently, is essentially tonic; according to some, it also possesses narcotic properties, and it undoubtedly acts as a narcotic poison on insects and some of the lower animals. In medicine it is chiefly used in dyspepsia resulting from atony of the digestive organs, and is found particularly useful in that form of it which is produced by dissipation. The infusion forms an excellent vehicle for alkaline remedies in the acidity of the stomach of gouty and rheumatic habits. Owing to its intense bitterness, quassia is no mean anthelmintic.

D. & M. of Adm.—In consequence of the difficulty of reducing it to powder, quassia is not given in substance; the dose of it would be from gr. xv. to gr. xxx.—*Infusum Quassiæ*, D. L. E. (Quassia, sliced, ℈j. (℈ij. L.; ℈iij., E.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oj., L. E.). Infuse for two hours in a covered vessel, and strain.) Dose, f℥i. to f℥ij.; if given in too large doses, it is

apt to occasion vomiting. The chalybeate preparations do not alter the colour of infusion of quassia; it may, therefore, be employed as a vehicle for their administration.—*Tinctura Quassiæ*, D. E. (Quassia chips, ʒi. (3x., E.); proof spirit, *by measure*, ℔ij. (Oij., E.). Macerate for 7 days, and strain.) Dose, fʒi. to fʒij.—*Tinctura Quassiæ composita*, E. (Cardamom seeds, bruised, and cochineal, bruised, of each, ʒss.; cinnamon, in moderately fine powder, and quassia chips, of each, ʒvj.; raisins, ʒvij.; proof spirit, Oij.; digest for 7 days, strain the liquor, express strongly the residuum, and filter. This tincture may be also made by percolation, as directed for compound tincture of cardamom, provided the quassia be rasped or in powder.) An aromatic and bitter tonic. Dose, fʒi. to fʒss.—*Extractum Quassiæ*, E. (To be prepared from quassia in the same way with extract of liquorice root.) Dose, gr. v. to gr. xv., in pill.

Incomp.—*With the infusion:* Nitrate of silver, and the acetates of lead.

Salix, E. Salix caprea, cortex; Salix fragilis, cortex; Salix alba, cortex, D. *Willow bark. Bark of Salix caprea*, E., *and of Salix fragilis and Salix alba*, D.—The genus salix is placed in the natural family *Salicaceæ*, and in the Linnæan class and order *Diœcia Diandria*. There are no less than 64 species of Salix indigenous to the British Islands; any of the species which possess a bitter-tasting bark may be used in medicine.

B. C.—Shrubs or trees. *Barren flowers;* scales of the catkin single-flowered, imbricated, with a nectariferous gland; perianth, none; stamens, 1 to 5. *Fertile flowers;* scales of the catkin single-flowered, imbricated, with a nectariferous gland; perianth, none; stigmas, 2, often cleft; capsule 1-celled, 2-valved, many-seeded; seeds comose.—Hooker.

P. & C. P.—Dried willow bark is met with in partially quilled pieces, of from 6 to 8 inches in length; the epidermis is smooth, and of a silver-gray colour. It is odourless, but has a very bitter, somewhat astringent taste. It yields its properties to boiling water and to alcohol. The constituents of willow bark are, tannin, resinous extractive, gummy matter, chlorophylle, yellowish colouring matter, an organic salt of magnesia, and a peculiar principle named *Salicin*, on which the febrifuge and tonic properties of the bark depend; it may be prepared as follows:

"Take of the bark of Salix pentandra (or of any other species the bark of which tastes bitter), ℔j.; macerate for 24 hours in milk of lime consisting of ʒij. of recently-burned lime in Oviij. of water; then boil for half an hour. Pour off the liquor, and repeat the process twice with the residuum. Mix all the decoctions; allow the mixture to settle, and pour off the clear liquor; concentrate to Oij.; digest with ʒviij. of animal charcoal, filter, and evaporate to dryness. Exhaust with spirit containing 28 per cent. of alcohol, distil off the spirit, and purify the crystals which form, by boiling with animal charcoal and recrystallizing. Thus treated, ℔j. of bark yields ʒv. of salicin."—Erdmann.

Salicin crystallizes in delicate, colourless, silky needles, which have an intensely bitter taste, but no odour; they are neutral. It is permanent in the air, is not altered at a temperature of 212°, fuses at 248°, and is decomposed at a higher temperature. It is

soluble in 18 parts of cold, and in 1 of boiling water; is very soluble in alcohol, but insoluble in ether and oil of turpentine. Its composition is $C^{21}H^{12}O^{9}+2HO$.

Th. E.—Willow bark is an excellent tonic, and has been used successfully as a febrifuge. It may be employed in the same cases as cinchona bark, for which it forms an admirable indigenous substitute. Salicin resembles in its properties disulphate of quina, over which it possesses the advantage of not being so liable to irritate the stomach. I have used it very extensively as a tonic in the debility following acute diseases, particularly in cases accompanied with irritability of the digestive organs, and consider its powers to be fully equal to those of disulphate of quina.

D. & M. of Adm.—Of the powdered bark, ʒss. to ʒj.—*Salicin.* As a tonic, gr. ij., three or four times a day; as a febrifuge, ℈i. to ℈ij., in divided doses during the intermission. It may be given in powder combined with sugar or some aromatic powder; or dissolved in water sweetened with some agreeable sirup, as sirup of orange peel, or sirup of *Hemidesmus Indicus.*

Simaruba, L. E. Quassia simarura, cortex radicis, D. *Simaruba. Bark of the root of Simaruba amara*, E.—*of Simaruba officinalis*, L.—*of Quassia Simaruba*, D.—The same tree is indicated by the three colleges, but the nomenclature of different botanists has been adopted. It is a native of Jamaica and Guaiana, and belongs to the natural family *Simarubaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

B. C.—A tall tree, with long, creeping roots; leaves alternate, pinnate; flowers small, whitish, diœcious, in panicles; fruit, 5-ovate, smooth, black capsules, placed on a fleshy disk.

P. P.—The bark of the root is alone officinal; it is imported from Jamaica, and is in long pieces folded flat, covered with a reddish-yellow epidermis, wrinkled and warty; the inner surface of the bark is yellowish-brown. It has a bitter, persistent taste, but no odour.

C. P.—Simaruba bark contains a trace of volatile oil, resinous matter, *ulmin*, a bitter principle analogous to *quassin*, lignin, and some salts. It yields its properties readily to water and to alcohol.

Th. E.—Simaruba is a bitter tonic, not much prescribed in the present day; in large doses it produces vomiting and purging. It has been highly praised for its remediate powers in chronic diarrhœa and dysentery, by many practitioners both on the Continent and in Great Britain. As a bitter tonic it is, however, much inferior to many remedies of this class.

D. & M. of Adm.—It is not given in powder; the following is its only officinal preparation: *Infusum Simarubæ*, D. L. E. (Simaruba, bruised, ʒss. (ʒiij., L. E.); boiling (distilled, L.) water, *by measure*, ℔ss. (Oj., L. E.); infuse for two hours in a covered vessel, and strain ["through linen or calico," E.].) Dose, f℥i. to f℥ij.

Incomp.—Lime-water; alkaline carbonates; and the salts of lead, mercury, and silver.

TARAXACUM, L. E. LEONTODON TARAXACUM, HERBA ET RADIX, D. *Dandelion. The root (and herb, D.) of Leontodon Taraxacum*, D. L.—*of Taraxacum Dens-leonis*, E.—Indigenous, belonging to the natural family *Compositæ*, and to the Linnæan class and order *Syngenesia Æqualis.*

B. C.—Root perennial, spindle-shaped; leaves all radical, runcinate, glabrous, toothed; scape with a single, large, yellow flower.

P. & C. P.—The whole of the dandelion plant abounds in a milky juice, which is most abundant in the root in the months of August and September, at which season they should be gathered for medical use. The juice has a bitter taste, but no odour; it contains resin, gum, uncrystallizable sugar, caoutchouc, various salts, and a peculiar bitter extractive, which has been recently obtained by M. Polex in a crystalline state, and named by him *Taraxacine;* the latter is probably the active principle of the plant. Dandelion root or herb yields its properties to boiling water.

TH. E.—Dandelion is a useful tonic in chronic diseases of the liver, and in other affections accompanied with derangement of the biliary organs, as in some forms of dyspepsia and of cutaneous disease. It is also held by many to be diuretic and aperient, but those effects are not produced unless it be given in very large doses.

D. & M. OF ADM.—*Decoctum Taraxaci*, D. E. (Taraxacum herb and root, fresh, ℥iv. (℥vii., E.); water, ℔ij. (Oij., E.); boil down to ℔j. (Oj., E.); squeeze and strain.) Dose, f℥i. to f℥ij.—*Extractum Taraxaci*, D. L. E. ("Proceed as for extract of gentian, employing the fresh root (and herb, D.)," D. L. "Fresh dandelion root, ℔i.; boiling water, cong. j.; proceed as for extract of poppy heads," E.) When properly prepared, this extract is of a fine brown colour, and has a bitter, not *sweet*, taste. Dose, gr. x. to ʒss.—*Liquor Taraxaci.* (Fresh dandelion roots, cleaned, dried, and sliced, ℥xij.; infuse for 24 hours in a sufficient quantity of distilled water to cover them. Press and set aside, that the fecula may subside; decant, and heat the clear liquor to 180° F.; filter the liquid while hot, and evaporate spontaneously until the product weighs ℥xiv.; to this add f℥iv. of rectified spirit.) When properly prepared, this liquid resembles in colour pale sherry; it is the best preparation of dandelion. The dose of it is from min. x. to min. xl.

INCOMP.—Acetate of lead; the sesqui-salts of iron; corrosive sublimate; nitrate of silver; and infusion of galls.

ULMUS, L. ULMUS CAMPESTRIS, CORTEX INTERIOR, D. *Elm bark. The inner bark of Ulmus campestris.*—Indigenous, belonging to the natural family *Cupuliferæ*, and to the Linnæan class and order *Pentandria Digynia.*

B. C.—A large tree, with rugged bark; leaves rhomboid-ovate, acuminate, wedge-shaped, and oblique at the base; flowers in dense heads, each subtended by a small scale.

P. & C. P.—The inner bark of the elm should alone be used in medicine; it is of a reddish-yellow colour, inodorous, with a bitter, somewhat astringent taste. It contains resin, gum, tannin, mucus-

extractive, and some salts. Its active principles are extracted by boiling water.

Th. E.—Elm bark is at present but little employed in medicine; it is a feeble tonic; the decoction, if taken in large quantity, determines to the skin, and, consequently, has been recommended by many in the treatment of cutaneous affections occurring in debilitated habits; in such cases it often acts beneficially.

D. & M. of Adm.—Used only in the form of decoction.—*Decoctum Ulmi*, D. L. (Fresh elm bark, ʒij. (ʒiiss., L.); distilled water, *by measure*, ℔ij. (Oij., L.); boil down to ℔j. (Oj., L.), and strain.) Dose, fʒiv. to fʒvj., three or four times a day.

Incomp.—Sulphate of iron; acetate of lead; nitrate of silver; and gelatin.

Zinci oxydum.—Oxyde of zinc (described in the division *Astringents*) is employed internally as a tonic in some forms of convulsive and spasmodic diseases, particularly epilepsy, in which it has been found in many instances beneficial, but its use must be persevered in for a considerable period. It may be given in powder or in pill, in doses of gr. j. or gr. ij., gradually increased to gr. x., twice daily.

Zinci sulphas.—*Sulphate of Zinc* (described in the division *Astringents*) has been also administered as a tonic in spasmodic diseases, but its utility in their treatment is very doubtful.

CHAPTER XXII.

SUPPLEMENTARY AGENTS.

In this chapter are included the different articles which, though not employed in medicine for their remediate powers, are in frequent use as *Colouring agents*, *Perfumes*, *Tests*, and *Pharmaceutical agents*.

Ammoniæ oxalas, E. *Oxalate of Ammonia.*

Prep.—*Edin.* "Oxalic acid, ʒiv.; carbonate of ammonia, ʒviij.; distilled water, Oiv.; dissolve the carbonate in the water, add gradually the acid, boil, and concentrate sufficiently for crystals to form on cooling."

This salt is not used in medicine. It was introduced into the last edition of the *Edin. Phar.* as a test for lime and its salts, with which it forms a white precipitate, soluble in nitric acid, but only sparingly soluble in muriatic acid.

Aqua destillata, L. E. Aqua distillata, D. *Distilled Water.*

Prep.—*Dub.* "Water, ℔xx.; put into a glass retort, and having rejected the first pound which comes over, distil with a moderate heat, cong. j." "*Lond.* Water

cong. x.; first let Oij. distil, which being thrown away, let cong. viij. distil. Keep the distilled water in a glass vessel." *Edin.* "Take any convenient quantity of spring water, distil it from a proper vessel, rejecting the first twentieth, and preserving the first half of the remainder."

Spring and river water contain foreign matters, which render them unfit for many pharmaceutical purposes, and as vehicles for many medicines; the above processes for their purification are therefore directed by the colleges. In the *Edin. Phar.*, the following tests for the purity of distilled water are given: "Free of colour and odour, unaltered by sulphuretted hydrogen or nitrate of silver, nitrate of baryta, or oxalate of ammonia."

ARGENTUM, D. L. E. *Silver. Metallic Silver.*

Silver is employed in pharmacy for preparing the nitrate. As met with in the shops, it usually contains traces of gold, copper, and lead; its freedom from which being desirable for the above purpose, the following tests for its purity are given: *Lond.*, *Edin.* "Entirely soluble in diluted nitric acid; this solution, treated with an excess of solution of muriate of soda, gives a white precipitate entirely soluble in aqua ammoniæ, and a fluid which is not affected by sulphuretted hydrogen. (Sp. gr., 10·4, L.)"

ARGENTI CYANIDUM, L. *Cyanide of Silver. Hydrocyanate of Silver.* [*Cyanuret of Silver*, U. S. P.]

PREP.—*Lond.* "Nitrate of silver, ʒij., ʒij.; diluted hydrocyanic acid and distilled water, of each, Oj.; dissolve the nitrate of silver in the water, and add to them the diluted hydrocyanic acid, and mix. Wash what is precipitated with distilled water, and dry it."

This preparation has been introduced into the London Pharmacopœia as a source of hydrocyanic acid. (See page 254.)

ARGENTI AMMONIATI SOLUTIO, E. *Solution of Ammoniaco-nitrate of Silver.*

PREP.—*Edin.* "Nitrate of silver, gr. xliv.; distilled water, fʒj.; aqua ammoniæ, q. s.; dissolve the salt in the water, and add the aqua ammoniæ gradually, and towards the end cautiously, till the precipitate at first thrown down is nearly, but not entirely redissolved."

This solution is employed as a very delicate test for arsenious acid. (See page 134.)

AURANTII FLORES, L. CITRUS AURANTIUM, FLORES, D. *Orange flowers. The flowers of Citrus Aurantium.*

AURANTII OLEUM, L. E. *Oil of orange. Oil of Neroli. The oil distilled from the flowers of Citrus Aurantium*, L. *Volatile oil of the flowers of Citrus vulgaris, and sometimes of Citrus Aurantium*, E.

AURANTII AQUA, L. E. *Orange-flower water. Distilled water of the flowers of Citrus vulgaris, and sometimes of Citrus Aurantium.*

The *Citrus Aurantium* has been described in the division *Refrigerants*, and the *C. vulgaris* in the division *Tonics*. Orange

flowers have a very agreeable odour, which depends on volatile oil; it is completely dissipated by drying. The volatile oil may be procured by distillation with water; it is imported into Britain from France and the South of Europe. It has been introduced into the London and Edinburgh Pharmacopœias on account of its agreeable odour, and as an agent for the extemporaneous preparation of orange-flower water.

Orange-flower water is an article of the Materia Medica in the Edinburgh Pharmacopœia, it being usually imported; the London College have given the following formula for its preparation:

Prep.—Aqua florum aurantii, L. "Orange flowers, ℔x.; proof spirit, f℥vij.; water, cong. ij.; let a gallon distil."

It is only employed on account of its fragrant odour as a vehicle for other medicines. As imported it is often impure, and frequently contains traces of lead or copper; its purity may be known by "its being nearly colourless, and unaffected by sulphuretted hydrogen gas," *Edin. Phar.*

Barytæ carbonas, L. E. *Carbonate of Baryta.*—This substance is found native in many parts of England, and is known to mineralogists by the name of *Witherite.* It is introduced into the pharmacopœias as being employed for the preparation of muriate of baryta. It acts as a narcotico-acrid poison on animals and on man.

Barytæ nitras, E. *Nitrate of Baryta.*—This salt is not used in medicine; it is directed to be employed by the Edinburgh College as a test, and formulæ are given for its preparation, and also for a solution of a given strength:

Prep.—Barytæ nitras, E. "To be prepared like the muriate of baryta, substituting pure nitric for muriatic acid."—Solutio Barytæ nitratis, E. "Nitrate of baryta, 40 grains; distilled water, 800 grains; dissolve the salt in the water, and keep the solution in well-closed bottles."

Barytæ sulphas, D. E. *Sulphate of Baryta. Heavy Spar.*—Not employed in medicine; used in pharmacy for the preparation of the muriate of baryta.

Bergamii oleum, L. Bergamotæ oleum, E. *Oil of Bergamot. The oil distilled from the rind of the fruit of Citrus Limetta Bergamium*, L. *Volatile oil of the rind of the fruit of Citrus Limetta*, E.—The bergamot citris is cultivated in the South of Europe, and belongs to the natural family *Aurantiaceæ*, and to the Linnæan class and order *Polyadelphia Polyandria.*

Oil of bergamot exists in the rind of the fruit, from which it is obtained either by expression or distillation; it is imported from the South of Europe. It is of a pale greenish-yellow colour, has a peculiar, fragrant odour, and a warm, pungent taste. Its sp. gr. is 0·862. It is only employed in medicine as a perfume, chiefly to give an agreeable odour to ointments.

Bismuthum, D. L. E. *Bismuth. Metallic Bismuth.*

This metal is only employed in pharmacy for preparing the trisnitrate. As met with in the shops, it frequently contains traces of copper or iron; its freedom from which being requisite for the above purpose, the following tests for ascertaining its purity are given by the London and Edinburgh Colleges: "It is dissolved by diluted nitric acid; when subnitrate of bismuth is precipitated from this solution by ammonia, the liquor is free from colour. Its sp. gr. is 9·8," L. "Entirely soluble in nitric acid with the aid of heat; and the solution is colourless, or nearly so, and deposites a white powder when much diluted with cold water," E.

CALCIS PHOSPHAS PRÆCIPITATUM, D. *Precipitated phosphate of Lime. Bone-phosphate of Lime. Subphosphate of Lime.*

PREP.—"Bones, calcined and reduced to powder, 1 part; dilute muriatic acid and water, of each, 2 parts; digest together for 12 hours, and strain the liquor; add to it sufficient water of caustic ammonia to throw down the phosphate of lime. Wash this with abundance of water, and dry it."

Bone-phosphate of lime is composed of 8 eq. of lime, and 3 of phosphoric acid ($8CaO+3PO^5$). It was formerly employed in medicine in rickets and mollities ossium, on the supposition of its affording bone-earth to the osseous system; the fallacy of such a doctrine is well understood now, and at present it is only used in pharmacy for preparing phosphorus and phosphate of soda.

CARBO ANIMALIS, L. E. *Animal charcoal. Ivory black obtained from bones (and flesh, L.).*

Animal charcoal is usually prepared by calcining the bones of animals in close vessels; thus obtained, it contains phosphate and carbonate of lime, which would unfit it for the purposes to which it is applied in pharmacy, namely, that of acting as a decolorizing agent in the preparation of the vegetable alkaloids; consequently, processes are given in the pharmacopœias for purifying the commercial article.

PREP.—CARBO ANIMALIS PURIFICATUS, L. E. "Animal charcoal, ℔j.; hydrochloric acid and water, of each, f℥xij.; mix the hydrochloric acid with the water, and pour it gradually upon the charcoal, then digest for two days with a gentle heat, frequently shaking them. Set by, and pour off the supernatant liquor, then wash the charcoal very often with water, until nothing acid is precipitated; lastly, dry it," L. "Ivory black, ℔j.; commercial sulphuric acid and water, of each, f℥xij.; mix the acid and water, add gradually the ivory black, stirring occasionally. Digest with a gentle heat for two days, agitating from time to time; then boil, dilute with two pints of water, collect the undissolved charcoal on a filter of linen or colico, and wash it with water till what passes through scarcely precipitates with solution of carbonate of soda. Heat the charcoal first moderately, and then to redness, in a closely-covered crucible," E.

After animal charcoal has been employed as a decolorizing agent, it loses its powers as such; which, however, may be again restored to it by drying and heating to redness. When properly prepared, "if it be incinerated with its own volume of red oxyde of mercury, it is dissipated, leaving only a scanty ash," *Edin. Phar.*

CARBO LIGNI, D. L. E. *Wood Charcoal.*

Wood charcoal is obtained by burning billets of wood, the ac-

cess of air being prevented. It is an article of the Materia Medica in the three pharmacopœias, being prepared on the larger scale for various uses in the arts, particularly for the manufacture of gunpowder. In medicine it is at present only employed to destroy fetor, for which purpose it is used in the form of powder or poultice to gangrenous sores, phagedenic ulcers, &c.; it is also used as a dentifrice, for which it is very generally employed, as by its mechanical action it removes incrustations from the teeth, and by its antiseptic powers it corrects fetor of the breath. Charcoal has been employed in the treatment of various diseases, but the only one in which it is ever employed in Great Britain is dysentery, and it is merely to correct the fetor of the evacuations, for which purpose it is given in doses of gr. xx., frequently repeated.—*Cataplasma Carbonis ligni*, D. (Take of wood charcoal, red hot, and just extinguished by pouring dry sand over it, q. s.; add it to the simple cataplasm warmed.) For gangrenous and fetid sores.

Cocci, L. E. Coccus cacti, D. *Cochineal. The entire insect, Coccus cacti.*—A native of Mexico, belonging to the class *Insecta*, order *Hemiptera*.

The cochineal insect feeds chiefly on the Nopal plant (*Opuntia cochinillifera*), large plantations of which are cultivated for its nourishment in Mexico. They are collected three times a year, killed by immersion in boiling water, and dried with stove heat; the first gathering is the best, consisting entirely of impregnated females, when they are largest, and afford most colouring matter. As met with in commerce, cochineal is in the form of small roundish grains (each grain being a separate insect); they are wrinkled, from one to two lines long, and of a silvery-purplish colour. They are inodorous, but have a rather bitter taste. Cochineal consists of some peculiar fatty matters, and a brilliant purplish-red colouring matter, which has been named *cochinillin;* and which is a principle constituent in the pigment technically known as *carmine*.

Cochineal was at one time supposed to possess anodyne properties, and was employed in medicine in the treatment of hooping-cough and neuralgia; at present it is only used as a colouring agent.

Cornu, L. E. Cornua cervina, ramenta, D. *Hartshorn shavings. The Horns of Cervus Elaphas.*

Hartshorn shavings are introduced into the Materia Medica as being employed in the preparation of antimonial powder (see page 117); boiled with water, they form a jelly similar to that obtained from cow's heels, calves' feet, &c. Calcined hartshorn is officinal in the London and Dublin Pharmacopœias; it is nearly similar in composition to the *bone-phosphate of lime*, and was used for the same purposes. (See page 411.)

Prep.—"Burn pieces of hartshorn in an open vessel until they become perfectly white; and then (proceeding as for *prepared chalk*, L.) reduce them to very fine powder," D. L.

Curcuma, L. E. Curcuma longa, radix, D. *Turmeric. Root (rhizome*, L. E.) *of Curcuma longa.*—A native of the East Indies and of China, belonging to the natural family *Zingiberaceæ*, and to the Linnæan class and order *Monandria Monogynia.*

Turmeric is in short, roundish, somewhat curved pieces, about the thickness of the little finger, reddish-yellow externally, reddish-brown within; they have a peculiar, aromatic odour, and a warm, bitter taste. The colouring principle of turmeric has been obtained in a separate state by treating the alcoholic extract with ether; it has been named *curcumin.* Turmeric possesses some aromatic properties, in consequence of which, as well as its colour, it is an ingredient in *curry* powder. It is not employed as a medicine, but is generally used as a testing agent for alkalies, which change its yellow colour to reddish-brown. For this purpose *Turmeric paper* is employed; it is prepared by soaking white *unsized* paper in a decoction (obtained by boiling ʒi. of coarsely-powdered turmeric in fʒxii. of water, straining through a cloth, and allowing the fluid to settle for a few minutes), and drying.

Ferri sulphuretum, D. E. *Sulphuret of Iron.*

Prep.—*Dub.* "Expose a rod of iron to the strongest heat of a forge till it becomes white hot, and having removed it from the fire, apply it instantly to a solid mass of sulphur. Receive the sulphuret of iron (which drops) in water, and having separated it from the sulphur, keep in well-closed vessels." *Edin.* "Iron filings, 3 parts; sublimed sulphur, 1 part; mix them thoroughly; heat the mixture in a covered crucible till it becomes red hot; remove the crucible from the fire, and allow the action to go on without heat. A much purer sulphuret may be obtained by a process similar to that ordered by the Dublin College."

Sulphuret of iron is not used in medicine; it is employed in pharmacy for the preparation of sulphuretted hydrogen gas.

Lacmus, L. E. Litmus, D. *Litmus. A prepared colouring matter from Rocella tinctoria*, E. *The plant* (*prepared Thallus*, L.) *of Rocella tinctoria*, D. L.—A native of the Mediterranean and Channel Islands, belonging to the natural family *Lichenaceæ*, and to the Linnæan class and order *Cryptogamia Algæ.*

This is not the only lichen employed in the preparation of litmus, but the plants used, as well as the exact process followed, is kept secret by the manufacturers. Professor Kane, who has bestowed much attention on the subject, states that the lichens employed are ground with water to form a uniform pulp, and sufficient water added to make the whole into a thick fluid; ammoniacal liquors from time to time mixed with this, the whole being exposed to the air and frequently agitated; when it has acquired the requisite shade of blue, chalk and plaster of Paris are added to the liquor, so as to form a consistent paste, which, when cut into little cubical masses and dried, forms the litmus of commerce. It is not employed in medicine; in pharmacy it is used as a test for acids and alkalies, its colour being changed to red by the former, and the original blue tint again restored by the latter. *Litmus paper* is prepared in a similar manner to *Turmeric paper.*

MANGANESII OXYDUM, E. MANGANESII BINOXYDUM, L. *Black oxyde of Manganese. Peroxyde of Manganese.*—Found native in some parts of England and Scotland; it is known to mineralogists under the name of *Pyrolusite.*

It is only used as a pharmaceutical agent, at least in Great Britain, being employed in the preparation of oxygen, chlorine, and iodine.

OSSA, D. *Bones.*

Bones are an article of the Materia Medica in the Dublin Pharmacopœia; they are employed in the preparation of animal charcoal, the *Calcis phosphas precipitatum*, and the *Sodæ phosphas* of the pharmacopœias.

PLUMBI CHLORIDUM, L. *Chloride of Lead.*

PREP.—"Acetate of lead, ʒxix.; boiling distilled water. Oiij.; chloride of sodium, ʒvj. Dissolve the acetate of lead and chloride of sodium separately; the former in three pints of distilled water, and the latter in one pint of distilled water. The liquors being then mixed together, wash what is precipitated with distilled water, when it is cold, and dry it."

This salt is employed by the London College in the preparation of the *hydrochlorate of morphia.* It is not used in medicine.

PLUMBI NITRAS, E. *Nitrate of Lead.*

PREP.—"Litharge, ʒivss.; diluted nitric acid, Oj. Dissolve the litharge to saturation with the aid of a gentle heat; filter, and set the liquor aside to crystallize. Concentrate the residual liquor to obtain more crystals."

This salt is employed by the Edinburgh College for the preparation of *iodide of lead*, and as a test for ascertaining the purity of *bitartrate of potash* (see page 110); it is not used in medicine.

PLUMBI OXYDUM HYDRATUM, L. *Hydrated oxyde of Lead.*

PREP.—"Solution of diacetate of lead, Ovj.; distilled water, cong. iij.; solution of potash, Ovj., or as much as may be sufficient to precipitate the oxyde; mix; wash with water what is precipitated until nothing alkaline remains."

It is employed by the London College in preparing the *disulphate of quina*, but is not used in medicine.

PLUMBI OXYDUM RUBRUM, E. *Red oxyde of Lead. Minium.*

Red lead is employed by the Edinburgh College for purifying the strong acetic acid (see page 129), and for preparing *Aqua Chlorinei.* It is not used in medicine.

POTASSII FERROCYANIDUM, L. E. *Ferrocyanide of Potassium.*

This salt has been used by some physicians in America as a sedative, but the results obtained from it are very uncertain, and it would appear to be rather an inert substance. It has been introduced into the pharmacopœias as being a cheap material for preparing hydrocyanic acid. (See page 254.)

PTEROCARPUS, L. E. PTEROCARPUS SANTALINUS, LIGNUM, D. *Red*

sandal-wood. Wood of Pterocarpus santalinus.—A native of Ceylon, belonging to the natural family *Leguminosæ*, and to the Linnæan class and order *Diadelphia Decandria.*

Red sandal, or, as it is often called, Red saunders-wood, is contained in the pharmacopœias, only as being employed as a colouring ingredient in the *compound spirit of Lavender.*

ROSA CENTIFOLIA, PETALA, D. L. E. *Petals of Rosa centifolia.*
ROSÆ OLEUM, E. *Attar or Otto of Roses. Volatile oil of the petals of Rosa centifolia.*

The Hundred-leaved or Cabbage rose, originally a native of Asia, is now cultivated freely in our gardens. It belongs to the natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia.*

The pharmaceutical preparations of this rose are employed in medicine as perfumes for giving an agreeable odour to mixtures, &c.; the volatile oil introduced into the last edition of the Edinburgh Pharmacopœia is too expensive an article for general use. Laxative properties have been ascribed by some to the sirup, but they probably depend on the sugar which it contains.

PHARM. PREP.—*Aqua Rosæ*, D. L. E. ("Petals of rosa centifolia, ℔viij.; water, sufficient to prevent empyreuma; distil one gallon," D. "Petals of rosa centifolia, ℔x.; proof (rectified, E.) spirit, f℥vij. (f℥iij., E.); water, cong. ij.; mix and distil a gallon," L. E. ["The petals should be preferred fresh; but it also answers well to use those which have been preserved by beating them with twice their weight of muriate of soda," E.].)—*Sirupus Rosæ*, D. L. *Sirupus Rosæ centifoliæ*, E. (Petals of rosa centifolia, dried (fresh, E.), ℥vij. (℔j., E.); boiling water, *by measure*, ℔iv. (Ovi., L.; Oiij., E.); pure sugar, ℔ix., ℥viij. (℔vi., L.; ℔iij., E.); macerate (infuse, E.) the petals in the water for 12 hours, and strain; evaporate the strained liquor to ℔iiss. (Oij., L.) (in a water-bath, D. L.), and then add the sugar, and (with the aid of heat, D. E.) dissolve it.) Sirup of roses is sometimes employed as a laxative for newly-born infants, in doses of f℥ij. or f℥iij.

SAMBUCI NIGRÆ, FLORES. *Flowers of the Common Elder.*

A water distilled from elder flowers is sometimes used in consequence of its agreeable odour as a vehicle for other medicines. It is officinal in the London and Edinburgh Pharmacopœias, and is obtained as follows:

PREP.—AQUA SAMBUCI, L. E. *Elder flower water.* "Elder flowers, ℔x. (*or* oil of elder, ℥ij., L.); proof (rectified, E.) spirit, f℥vij. (f℥iij., E.); water, cong. ij.; mix, and distil a gallon."

SODÆ PHOSPHATIS SOLUTIO, E. *Solution of Phosphate of Soda.*

Phosphate of soda has been described in the division *Cathartics;* this solution is only employed as a test.

PREP.—"Phosphate of soda, free of efflorescence, 175 grains; distilled water, f℥viij.; dissolve the salt in the water, and keep the solution in well-closed bottles," *Edin. Phar.*

ZINCUM, D. L. E. *Zinc. Metallic Zinc.*

Zinc is employed in pharmacy for preparing the different compounds of the metal which are used as medicines. As met with in commerce, it frequently contains many impurities, as carbon, iron,

copper, arsenic, &c. The London and Edinburgh Colleges have therefore given the following tests, by which it may be ascertained if it is sufficiently pure for the above purpose: "Almost entirely dissolved by diluted sulphuric acid, and the solution is colourless; what is thrown down from the solution by ammonia is white, and when the ammonia is added in excess, it is again dissolved. The sp. gr. of the metal is 6·86," L. "It dissolves in a great measure in diluted sulphuric acid, leaving only a scanty grayish-black residuum. This solution presents the characters of the solution of sulphate of zinc" (see page 82), E.

APPENDIX.

A. FORMULÆ.

The following formulæ are principally confined to the new remedies which are described in this work, or to those as yet not in general use.

ANTACIDS.

℞ Aquæ Ammoniæ, min. x.; Infusi Chirettæ, f℥i.; Tincturæ Aurantii, f℥ij., M. Fiat haustus, mane meridieque sumendus. (A useful antacid draught in the dyspepsia of the debilitated, attended with acid eructations.)

℞ Ammoniæ Bicarbonatis, gr. viij.; Infusi Calumbæ, f℥i.; Tincturæ Humuli, f℥i.; Tincturæ Hyoscyami, min. xx., M. Fiat haustus, bis quotidie sumendus. (Less stimulating than the former, and better adapted for cases in which the stomach is irritable.)

℞ Ammoniæ Carbonatis, gr. xxiv.; Fellis Bovini Inspissati, ℥ss.; Mucilaginis, q. s., M. Fiant pilulæ duodecim; Capiat unam ter in die. (In dyspepsia acompanied with vomiting of food and constipation.)

℞ Aquæ Ammoniæ Carbonatis, f℥ss.; Infusi Cascarillæ, f℥vij.; Spiritus Ætherei Nitrosi, f℥i.; Spiritus Cinnamomi, f℥iij., M. Fiat mistura, de quâ sumantur cochlearia ij. ampla ter in die. (In the lithic acid diathesis, with debility of the digestive organs.)

℞ Aquæ Calcis, f℥iv.; Confectionis Aromaticæ, ℥ij.; Tere simul et gradatim adde, Misturæ Amygdalarum, f℥iiiss.; Aquæ Lauro-cerasi, f℥i., M. Fiat mistura; Capiat cochlearia ij. ampla bis terve in die, phialâ priùs concussâ. (Useful in cardialgia and in gastrodynia.)

℞ Misturæ Cretæ, f℥vi.; Tincturæ Humuli, f℥i.; Tincturæ Cardamomi, f℥vij.; Vini Opii, f℥i., M. Capiat semiunciam sextis horis. (In diarrhœa dependant on acidity of the *primæ viæ*.)

℞ Pulveris Cretæ compositi, gr. xviij.; Carbonatis Sodæ siccati, gr. vj.; Pulveris Tragacanthæ, gr. xij., M. Divide in partes sex æquales, quarum capiat unam quâque secundâ vel tertiâ horâ. (In the diarrhœa of children.)

℞ Aquæ Magnesiæ Bicarbonatis, f℥ss.; Spiritus Lavandulæ compositi, f℥ij., M. Fiat haustus, sumat statim et repetatur semihorio si opus sit. (An excellent remedy in heartburn.)

℞ Solutionis Alkalinæ (*Brandish*), f℥v.; Infusi Chirettæ, f℥viij.; Spiritus Anisi compositi, f℥iij.; Sirupi Aurantii, f℥i., M. Fiat mistura; Capiat cochlearia ij. magna ter in die. (In the lithic acid diathesis.)

℞ Sodæ Bicarbonatis, gr. x.; Infusi Anthemidis, f℥iss.; Aquæ Lauro-cerasi, f℥ss.; Creasoti, min. j., M. Fiat haustus sextis horis sumendus, et ad tertiam vel quartem vicem repetendus si opus sit. (In acidity of the stomach with vomiting.)

℞ Sodæ Carbonatis siccati, ℥ss.; Pulveris Myrrhæ, gr. xviij.; Pulveris Ipecacuanhæ, gr. iij., M. Divide in chartulas, vj. quarum unam sumat quartâ quâque horâ. (An excellent antacid in chronic diarrhœa and dysentery.)

ANTHELMINTICS.

℞ Sirupi Allii sativi (page 40), f℥i.; Olei Terebinthinæ, f℥ss.; Decocti Hordei, f℥vij., M. Fiat enema, injiciatur statim, et horæ unius spatio adhibeatur enema catharticum. (For ascarides in the rectum; half or a fourth part of the above may be used for children.)

℞ Artemisiæ Santonicæ, gr. xxx. ; Calomelanos, gr. vj. ; Muriatis Sodæ, gr. xij. ; Sirupi Jalapæ (page 103), ʒij., M. Divide in bolos ij. ; Sumat unum mane, et alterum post horas sex, nisi priùs benè dejecerit alvus. (In cases of lumbrici or ascarides.)

℞ Decocti Geoffroyæ, fʒi. ; Infusi Gigartinæ (page 42), fʒiss. ; Tincturæ Valerianæ ; Sirupi Zingiberis, ā ā, fʒij., M. Fiat mistura, Capiat partem tertiam trihorio. (For expelling lumbrici.)

℞ Olei Filicis-maris (page 43), min. xxx. ; Misturæ Amygdalarum, fʒij., M. Fiat emulsio, et divide in partes æquales ij., quarum sumatur una horâ somni, et altera mane sequente. (A most efficacious anthelmintic for the *tape-worm*. If it do not purge, an active cathartic should be given in four hours after the second dose.)

℞ Granati radicis corticis, ʒiij. ; Pulveris Sabadillæ, gr. vj. ; Pulveris Aromatici, ʒss., M. Divide in pulveres sex, Capiat unum omni semihorâ ad sextam vicem. (In cases of tænia ; the last dose should be followed by an active saline purge.)

℞ Pulveris Spigeliæ, gr. x. ; Pulveris Stanni, ʒij. ; Sirupi Zingiberis, fʒss. ; Mellis, q. s., M. Fiat Bolus, horâ ante jentaculum sumendus, et per dies tres repetendus, postea adhibeatur mistura purgans ad plenam alvi solutionem. (In cases of lumbrici.)

ANTISPASMODICS.

℞ Tincturæ Fuliginis, fʒss. ; Misturæ Camphoræ cum Magnesiâ, fʒvj. ; Sirupi Aurantii, fʒiss., M. Fiat mistura, Capiat unciam omni horâ donec abierit spasmus. (In the hysteria of females.)

℞ Spiritus Fuliginis, fʒss. ; Aquæ Sodæ carbonatis, fʒij. ; Sirupi Aurantii, fʒiss. ; Aquæ Menthæ pulegii, fʒiss., M. Fiat mistura, sumat cochleare medium tertiis vel quartis horis. (In the advanced stages of hoopingcough in children ; a teaspoonful for infants.)

℞ Ætheris Assafœtidæ (page 49), min. xx. ; Spiritus Ammoniæ aromatici, fʒss. ; Misturæ Moschi, fʒj., M. Fiat haustus. (A useful antispasmodic in hysteria and spasmodic colic.)

℞ Tincturæ Castorei compositæ, fʒv. ; Ætheris Sulphurici, fʒiij. ; Misturæ Moschi, fʒvij., M. Fiat mistura, de quâ sumatur cochleare unum magnum secundis horis, donec evanescant symptomata. (In cramp of the stomach, in spasmodic or flatulent colic, in hysteria, in hiccough, in nervous palpitations, &c.)

ASTRINGENTS.

℞ Aceti Destillati, fʒij. ; Aquæ Lauro-cerasi, fʒij. ; Sirupi Rhœados, fʒvj. ; Aquæ destillatæ, fʒv., M. Fiat mistura, cujus capiat cochlearia duo ampla sextis horis. (An excellent sedative astringent in chronic mucous discharges attended with much debility and irritability of the stomach.)

℞ Acidi Sulphurici aromatici, fʒiiss. ; Sirupi Rosæ, fʒvss. ; Sirupi Hemidesmi Indici (page 190), fʒss. ; Aquæ destillatæ, fʒviss., M. Fiat mistura, sumat unciam sextis horis. (A useful astringent mixture in passive hœmorrhages, and in the colliquative sweating of hectic.)

℞ Tincturæ Cinnamomi compositæ, fʒiij. ; Acidi Sulphurici diluti, fʒij. Fiat mistura, cujus capiat guttas xx. ter in die, ex cyatho Decocti Hordei. (In the same cases as the above mixture.)

℞ Aluminis, ʒiss. ; Sirupi Rosæ, fʒj. ; Aquæ Rosæ, fʒiv., M. Fiat mistura, cujus sumat cochleare amplum sextis horis. (In old cases of diarrhœa, and in painter's colic.)

℞ Infusi Rosæ acidi ; Decocti Althææ, ana, f℥iij. ; Aluminis, ʒi. ; Mellis Rosæ, f℥ij., M. Fiat gargarisma, sæpè utenda. (A useful gargle in relaxed sore throat, and in chronic ulcerations of the mouth and fauces.)

℞ Creasoti, min. iv. ; Tincturæ Gallarum, f℥ij. ; Aquæ destillatæ, f℥ij., M. Fiat lotio. (In indolent ulcers with excessive discharge.)

℞ Sulphatis Ferri ; Carbonatis Potassæ, ana, ʒss. ; Mucilaginis Gummi Tragacanthæ, q. s. Fiat massula et divide in pilulas, xij. ; Capiat unam ter in die. (An excellent remedy in leucorrhœa.)

℞ Ferri Pernitratis, f℥ij. ; Sirupi Simplicis, f℥vj. ; Aquæ destillatæ, f℥iij., M. Capiat cochleare amplum sextis horis. (A very useful astringent and tonic mixture in chronic mucous diarrhœa, and in leucorrhœa.)

℞ Sulphatis Cupri, gr. vj. ; Pulveris Myrrhæ, gr. xij. ; Conservæ Rosæ, ℈ij., M. Divide in pilulas, xij., Sumat unam sextis horis. (In chronic diarrhœa and dysentery.)

℞ Tincturæ Gallarum, f℥ss. ; Misturæ Amygdalarum, f℥iss. ; Mucilaginis, f℥ss. ; Aquæ fontis, f℥vss., M. Capiat cochleare amplum post singulas liquidas dejectiones. (An excellent astringent mixture in colliquative diarrhœa.)

℞ Pulveris Kino compositi, gr. x. ; Pulveris Cretæ compositi, gr. xv. ; Sirupi Zingiberis, q. s., M. Fiat Bolus, sextâ quâque horâ sumendus. (In diarrhœa occurring in the old and debilitated.)

℞ Decocti Hæmatoxyli, f℥vj. ; Tincturæ Monesiæ (page 71), f℥i. ; Sirupi Aurantii, f℥i. ; Fiat mistura, cujus capiat cochleare amplum post singulas liquidas dejectiones. (In chronic diarrhœa and dysentery.)

℞ Monesiæ, ʒi. ; Aluminis ; Confectionis Aromaticæ, ana, ʒss. ; Sirupi, q. s., ut fiant pilulæ xxiv. ; Sumat ij. ter in die. (In leucorrhœa, in chronic diarrhœa, and in pyrosis.)

℞ Plumbi Acetatis ; Digitalis, ana, gr. vi. ; Opii, in pulvere, gr. iij. ; Conservæ Rosæ, gr. xij., M. Divide in pilulas sex, e quibus sumatur una ter in die. (In active hœmorrhages.)

℞ Decocti Bistortæ (page 76), f℥vj. ; Decocti Papaveris, f℥ij. ; Acidi Tannici, gr. xviij., M. Fiat liquor, cujus quantum satis sit quater de die, ope siphunculi eburni, in vaginam injiciatur. (In chronic leucorrhœa.)

℞ Acidi Tannici, gr. xij. ; Conservæ Rosæ, ʒss., M. Divide in pilulas xij. e quibus sumatur una sextis horis. (An excellent astringent in the colliquative sweating and diarrhœa of phthisis.)

℞ Decocti Granati, f℥vij. ; Mellis Boracis, f℥i., M. Sit gargarisma sæpè utendum. (In aphthous ulcerations of the mouth and fauces.)

℞ Sulphatis Zinci, ℈i. ; Aquæ destillatæ, f℥iv. ; Tincturæ Croci, f℥ij., M. Fiat collyrium, sæpè utat. (A useful eye-wash in chronic ophthalmia.)

℞ Pulveris Uvæ-ursi, ʒiij. ; Acidi Tannici, gr. vi. ; Pulveris Opii, gr. ij., M. Divide in portiones duodecim æquales ; Capiat unam ter in die. (In passive hœmaturia, and in chronic catarrh of the bladder.)

℞ Sulphatis Zinci, gr. xxiv. ; Ipecacuanhæ, gr. iv. ; Pulveris Myrrhæ, gr. xxiv. ; Lactucarii ; Conservæ Rosæ, ana, ʒss., M. Divide in pilulas xxiv. equibus sumatur una sextâ quâque horâ. (In chronic diarrhœa and dysentery.)

℞ Calcis Chlorinatæ, ʒiv. ; Aquæ destillatæ, f℥xj. ; Solve et cola, dein adde, Mellis Rosæ, ʒi., M. Fiat liquor, quo gingivas sæpè gargarizet. (A most efficacious gargle in excessive salivation.)

CATHARTICS.

℞ Decocti Aloës compositi, f℥ij. ; Sirupi Croci, f℥ss. ; Sirupi Jalapæ (page 103), f℥ij., M. Fiat mistura duabus vicibus sumenda. (In torpidity of the bowels, and in chlorosis.)

℞ Calomelanos, gr. xxx. ; Saponis Crotonis (page 97), gr. vj. ; Pilulæ Colocynthidis et Hyoscyami, gr. xxiv., M. Divide in pilulas xij. e quibus sumatur una ter de die. (In spasmodic and nervous diseases.)

℞ Pilulæ Colocynthidis compositæ ; Saponis Jalapinæ (page 103), ana, ʒi., M. Fiat massula et divide in pilulas xxiv. e quibus sumantur duæ, prout res poscit. (A good formula for purgative pills for general use.)

℞ Pilulæ Cambogiæ compositæ, ℈ij. ; Pilulæ Hydrargyri, ℈i., M. Divide in pilulas xij. ; Capiat ij. pro re natâ. (In constipation with deficient secretion of bile.)

℞ Extracti Colchici acetici, gr. xij. ; Pilulæ Hydrargyri, gr. xxx. ; Extracti Hyoscyami, gr. xviij., M. Fiant pilulæ duodecim, e quibus sumantur duæ tertiâ quâque nocte. (An excellent cathartic in gouty and rheumatic habits, the following draught being administered the next morning.)

℞ Succi Colchici, min. x. ; Magnesiæ Carbonatis, gr. xij. ; Spiritus Cinnamomi, f℥ss. ; Aquæ Cinnamomi, f℥iss., M. Fiat haustus. (To be given in the morning, two of the above pills having been taken the previous evening.)

℞ Vini Seminum Colchici, f℥ss. ; Tincturæ Rhei et Aloës, f℥i. ; Spiritus Myristicæ, f℥ss. ; Infusum Rhei, f℥vi., M. Fiat mistura, de quâ sumantur cochlearia ampla ij., tertiis vel quartis horis ad effectum. (A useful cathartic in gouty and rheumatic habits.)

℞ Tincturæ Colocynthidis (page 96), min. xx. ; Infusi Sennæ cum Tamarindis, f℥ij. ; Tincturæ Cardamomi compositæ, f℥ss., M. Fiat haustus, bis quotidie sumendus. (In dropsical cases.)

℞ Tincturæ Elaterii (page 99), f℥i. ; Sirupi Sennæ, f℥ss. ; Sirupi Zingiberis, f℥i. ; Aquæ Menthæ Piperitæ, f℥i., M. Fiat haustus, quam primum sumendus et, nisi alvus sit intereà copiosè soluta, quadrihorio repetatur. (In ascites occurring in the robust, provided no inflammatory tendency be present.)

℞ Olei Euphorbiæ Lathyris (page 99), min. vj. ; Mucilaginis Gummi Arabici, f℥ij. ; Tere optime simul, hisque inter terendum paulatim adjice, Sirupi Croci, f℥ss. ; Aquæ destillatæ, f℥vj. Fiat haustus. (A safe and efficacious purgative draught.)

℞ Saponis Crotonis (page 97), gr. ss. ; Extracti Hyoscyami ; Pilulæ Hydrargyri, ana, gr. iv. ; Olei Pimentæ, min. ij., M. Divide in pilulas ij., horâ somni sumat.

℞ Tincturæ Hellebori, f℥iss. ; Infusi Sennæ compositi, f℥j ; Sirupi Zingiberis, f℥ij., M. Fiat haustus, primo manè sumendus. (The above pills and draught will be found very useful in cephalalgia dependant on congestion of the vessels of the head, and accompanied with a torpid state of the bowels ; also in mania.)

℞ Hydrargyri cum cretâ, gr. xij. ; Pulveris Scammonii, gr. xij. ; Carbonatis Sodæ siccati, gr. vj. ; Pulveris Aromatici, gr. xij., M. Divide in portionibus paribus vj., e quibus sumatur una omni manè. (An excellent alterative and cathartic for children ; very useful in worm cases.)

℞ Lini Cathartici, herbæ recentis, ʒiij. ; Aquæ ferventis, f℥ij. ; Digere per horas duas in vase clauso, cola et adde, Tincturæ Cardamomi compositæ, f℥i. Fiat haustus. (In simple constipation.)

℞ Resinæ Jalapæ (page 103), gr. v. ; Confectionis Amygdalarum, gr. xxx. ; Simul terantur, hisque inter terendum adde, Aquæ destillatæ, f℥iss., M. Fiat haustus, illicò sumendus. (An excellent cathartic in simple constipation.)

℞ Sulphatis Magnesiæ, ʒvj. ; Infusi Rosæ acidi, fʒiss., M. Fiat haustus. (An excellent purgative draught in mild febrile and inflammatory affections accompanied with constipation.)

℞ Mannitæ (page 106), ʒss. ; Aquæ Menthæ piperitæ, fʒss. Solve ; Fiat haustus. (An excellent laxative for children.)

℞ Potassæ Sulphatis, ʒss. ; Acidi Sulphurici diluti, min. v. ; Aquæ Rosæ, fʒiss., M. Fiat haustus. (In mild febrile and inflammatory affections.)

℞ Potassæ Bitartratis, ʒiv. ; Acidi Boracici, ʒi. ; Aquæ destillatæ, fʒxij. Fiat mistura, cujus sumatur pars quarta tertiâ quâque horâ ad plenam alvi solutionem. (In dropsical swellings.)

℞ Potassæ Bitartratis, ʒss. ; Pulveris Jalapæ, ʒss. ; Electuarii Sennæ, ʒiss. ; Sirupi Sennæ, q. s., M. Fiat electuarium, de quo sumat instar nucis moschatæ, ter quotidie, vel donec alvus commodè purgetur. (In hæmorrhoidal affections.)

℞ Infusi Sennæ cum Tamarindis, fʒiss. ; Sirupi Rhei (page 116), fʒij. ; Spiritus Nucis Moschatæ, fʒss., M. Fiat mistura, de quâ sumatur cochlearia ij. ampla secundis horis donec alvus leniter dejecerit. (In simple constipation of the old or debilitated.)

℞ Mellis Violæ (page 127) ; Mannæ, ana, ʒss. ; Sirupi Violæ, q. s. Fiat electuarium, cujus capiat cochleare parvulum pro re natâ. (A mild laxative, readily taken by children.)

℞ Resinæ Scammonii, gr. v. ; Confectionis Amygdalarum, gr. xxx. ; Simul terantur, hisque inter terendum adde, Aquæ destillatæ, fʒiss., M. Fiat haustus. (An excellent cathartic in simple constipation. The dose for children is one third or one half of the above.)

℞ Pulveris Scammonii, ʒss. ; Pulveris Jalapæ, ʒi. ; Sirupi Aurantii, q. s. Ut fiant pilulæ xxiv. e quibus sumantur duæ alternis horis vel donec bis dejecerit alvus. (In the constipation of lead colic.)

℞ Resinæ Jalapæ ; Calomelanos ; Saponis Hispanici, ana, gr. xv. ; Olei Caryophylli, min. vi., M. Divide in pilulas xij. e quibus sumatur una semihorio ad plenam alvi solutionem. (In obstinate constipation.)

℞ Sodæ Sulphatis, ʒv. ; Infusi Rosæ acidi, fʒiss. ; Acidi Sulphurici diluti, min. ij., M. Fiat haustus. (A useful antiphlogistic cathartic.)

℞ Sodæ Phosphatis, ʒiv. ; Aquæ Menthæ Piperitæ, fʒiij. ; Solve, dein adde, Sirupi Sennæ, fʒi. Fiat mistura, de quâ capiat cochleare amplum secundis horis donec alvus commodè moveatur. (A useful purgative mixture in the mild febrile affections of children.)

℞ Olei Terebinthinæ ; Olei Ricini, ana, fʒij. ; Decocti Hordei, fʒvj., M. Fiat enema. (The best purgative in *purpura hæmorrhagica* occurring in children ; it may be administered twice daily until the spots begin to fade.)

CAUSTICS.

℞ Chloridi Zinci, ʒss. ; Muriatis Antimonii, min. xv. ; Farinæ, ʒi. ; Aquæ destillatæ, q. s. Fiat massa, quâ pars morbida exedatur. (An excellent caustic paste in cancer, and in lupus.)

℞ Chloridi Zinci, ʒss. ; Farinæ, ʒj. *vel*, ʒij. *vel*, ʒiij., M. Fiat massa. (The above proportions of flour may be used according to the strength the caustic paste is wished to be ; it is employed in the same cases as the former.)

℞ Arsenici Albi, partes vj. ; Calomelanos, partes xcvj., M. Fiat pulvis. Dupuytren. (Sprinkled on lint, and applied in small portions at a time, to open cancer ; the practice is not unattended with danger.)

℞ Hydrargyri Oxydi Nitrici; Aluminis siccati, ana, ʒi., M. Fiat pulvis. (Sprinkled on the parts, to repress exuberant and spongy granulations.)

℞ Hydrargyri Oxydi Nitrici; Amyli, ana, ʒss.; Sacchari Puri, ʒi. Misce benè terendo simul, ut fiat pulvis subtilissimus. (In thickening of the cornea, to be blown into the eye three or four times a day.)

℞ Carbonatis Cupri (page 135), ʒij.; Adipis preparatæ, ʒi., M. Fiat unguentum. Devergie. (In the chronic forms of eczema and impetigo of the scalp, where stimulating applications are admissible.)

DIAPHORETICS.

℞ Antimonii Oxydi Nitromuriatici, ʒiss.; Muriatis Morphiæ, gr. iss.; Conservæ Rosæ, q. s. Fiant pilulæ xxiv., e quibus sumantur duæ, tertiis horis. (In chronic cutaneous diseases, and in chronic rheumatism.)

℞ Pulveris Antimonialis, gr. iij.; Calomelanos, gr. ss.; Extracti Hyoscyami, gr. iss., M. Fiat pilula, sumenda quâque tertiâ horâ. (In acute rheumatism, and in mild febrile affections, with a harsh, dry skin.)

℞ Antimonii Tartarizati, gr. ij.; Decocti Dulcamaræ, fʒvij.; Sirupi Hemidesmi (page 190), fʒi., M. Fiat mistura, de quâ capiat cochleare amplum secundis horis. (An excellent diaphoretic mixture in febrile and inflammatory affections.)

℞ Tincturæ Guaiaci Ammoniatæ, fʒij.; Mucilaginis Gummi Tragacanthæ, fʒvj.; Tere simul, et paulatim adjice, Misturæ Amygdalarum, fʒij. Fiat mistura, sumenda in die partitis vicibus. (In atonic gout, in chronic rheumatism and in chronic cutaneous diseases.)

℞ Sarsaparillæ Radicis, incisæ, ʒiss.; Aquæ Destillatæ ferventis, Oj. Macera per horas duodecim in vase clauso, subinde agitans, dein cola.

℞ Hujus Infusi, fʒx.; Infusi Sassafras (page 921); Decocti Mezerei, ana, fʒi.; Sirupi Hemidesmi (page 190), fʒij., M. Fiat mistura, de quâ sumatur cyathum vinarium ter quaterve in die. (In secondary syphilitic affections, particularly the forms of cutaneous disease.)

DIURETICS.

℞ Decocti Chimaphilæ, fʒvij.; Nitratis Potassæ, ʒss.; Spiritus Ætherei Nitrosi, fʒss.; Spiritus Juniperi compositi, fʒiij. M. Fiat mistura; Capiat cochleare amplum quâque tertiâ horâ. (A stimulating diuretic in old cases of dropsy.)

℞ Extracti Pareiræ, ʒi.; Carbonatis Sodæ siccati, gr. xij.; Extracti Conii, gr. vj.; Sirupi Papaveris, q. s., ut fiant pilulæ xxiv.; Capiat ij. sextâ quâque horâ. (In calculous affections, and in chronic catarrh of the bladder.)

℞ Bitartratis Potassæ, ʒss.; Ureæ, ʒij.; Mellis, ʒss., M. Fiat electuarium, de quo capiat instar nucis moschatæ, ter quotidie. (In anasarca or ascites, with deficient secretion of urine.)

℞ Pulveris Scillæ, gr. xxx.; Potassæ Acetatis, ʒss.; Oxymellis Scillæ, fʒij.; Mellis, ʒss.; Olei Juniperi, min. xx., M. Fiat electuarium, de quo capiat instar nucis moschatæ sextis horis. (In old cases of anasarca.)

℞ Amygdalarum Dulcium decorticatarum, ʒj.; Cantharidum, in pulvere subtilo, gr. x.; Sacchari Puri, ʒss.; Tere bene simul, et gradatim adjice, Aquæ tepidæ, fʒx., Cola. Liquoris colatæ capiat cochleare amplum tertiis horis. (In torpor of the kidneys, and in incontinence of urine caused by paralysis of the neck of the bladder.)

℞ Olei Terebinthinæ, fʒi.; Gummi Tragacanthæ, fʒi.; Sirupi Aurantii, fʒi.; Tere bene simul, et gradatim adjice, Aquæ Menthæ Piperitæ, fʒv.; Spiritus Ætherei Nitrosi, fʒij., M. Capiat cochleare amplum, quâque secundâ horâ. (A stimulating diuretic.)

EMETICS.

℞ Ammoniæ Carbonatis, gr. xxx. ; Infusi Senegæ, f℥i. ; Sirupi Croci, f℥ij., M. Fiat haustus statim sumendus. (In the suffocative catarrh of typhus.)

℞ Emetinæ Impuræ, gr. ij. ; Sirupi Aurantii florum, f℥i. ; Aquæ destillatæ, f℥ij., M. Capiat cochleare amplum semihorio donec supervenerit vomitio. (A certain emetic, applicable to the same cases as ipecacuanha.)

℞ Violæ Odoratæ Radicis, ʒss. ; Sirupi Scillæ, f℥i., M. Fiat Bolus, statim sumendus, et post horam repetendus si opus sit. (An excellent substitute for ipecacuanha.)

℞ Sinapis, ʒi. ; Aquæ tepidæ, f℥xij., M. Fiat mistura statim sumenda. (An excellent stimulating emetic, particularly useful when the vital powers are sinking.)

EMMENAGOGUES.

℞ Tincturæ Ergotæ (page 177), f℥iss. ; Sirupi Croci, f℥ij. ; Decocti Aloës compositi, f℥vj., M. Fiat mistura, cujus capiat cochlearia ampla ii. sextis horis. (In amenorrhœa, with torpor of the circulation.)

℞ Tincturæ Ergotæ Æthereæ (page 177), f℥i. ; Infusi Sabinæ (page 091), f℥iiiss. ; Sirupi Croci, f℥ss., M. Fiat mistura, de quâ sumatur cochleare magnum ter in die. (In chlorotic amenorrhœa, after the use of ferruginous preparations for some time.)

℞ Sulphatis Ferri siccati, gr. xx. ; Pilulæ Aloës cum Myrrhâ, ʒi. ; Olei Rutæ, min. vj., M. Fiat massula et divide in pilulas xxiv. e quibus sumantur ij. bis quotidie. (Useful in chlorosis.)

℞ Rubiæ Tinctorum, ʒi. ; Theriacæ, q. s. ; Olei Sabinæ, min. xij., M. Fiat electuarium cujus capiat sextam partem ter de die. (In simple atony of the uterine organs.)

EMOLLIENTS.

℞ Olei Olivæ, f℥ij. ; Vitelli Ovi unius ; Sirupi Althææ, f℥i. ; Infusi Lini compositi, f℥iij. Fiat mistura secundum artem ; Capiat æger cochleare amplum subinde. (In inflammatory affections of the kidneys, in ardor urinæ, and as a general demulcent.)

℞ Decocti Hordei compositi, f℥x. ; Sirupi Hemidesmi (page 190), f℥ij., M. Fiat mistura, cujus sumatur cochlearia ampla duo interdum. (An agreeable demulcent and emollient mixture, useful in inflammations of the mucous membranes.)

℞ Decocti Tussilaginis (page 198) ; Misturæ Amygdalarum, ana, f℥iij. ; Sirupi Hemidesmi, f℥ij., M. Fiat mistura, de quâ capiat cochlearia ampla dus horis intermidiis. (A useful demulcent mixture in chronic bronchitis.)

℞ Decocti Althææ, f℥vi. ; Decocti Glycirrhizæ, f℥i. ; Tincturæ Opii Camphoratæ, f℥ij. ; Sirupi Hemidesmi, f℥i., M. Fiat mistura, capiat cochleare amplum tussi urgente. (In the troublesome cough of phthisis, and of chronic bronchitis.)

EPISPASTICS.

℞ Cantharidum, in crasso pulvere, ʒiv. ; Acidi Pyrolygnei concentrati, f℥ij. ; Spiritus Vini rectificati, Oj. Digere in vase vitreo clauso per dies tres, dein exprime et cola ; Tinctura destillat calore gradûs 160° F. ad idoneam spissitudinem. (By this process a sirupy-looking extract is obtained, which, spread thinly on paper and applied to the skin, vesicates rapidly and freely.)

℞ Terebinthinæ Vulgaris ; Mastiche, ana, partes sex ; Cantharidum, in pulvere, partes duas ; Euphorbiæ Pulveris, partem unam, M. (For a perpetual blister, or to act as a powerful counter-irritant.)

℞ Euphorbiæ, in pulvere subtilo, gr. xxx.; Adipis præparati, ʒi., M. Fiat unguentum. (An excellent issue ointment: see page 205)

℞ Olei Terebinthinæ, fʒi.; Vitelli Ovi unius; Tincturæ Capsici, fʒiss.; Cetacei, ʒss.; Tere bene, et adde inter terendum, Olei Olivæ, fʒiij. Fiat linimentum. (An excellent rubefacient liniment.)

℞ Linimenti Ipecacuanhæ (page 205); Linimenti Ammoniæ, ana, p. æ., M. Fiat linimentum. (An excellent counter-irritant applied with friction.)

EXPECTORANTS.

℞ Sirupi Hemidesmi, fʒiv.; Tincturæ Balsami Tolutani, fʒss.; Tincturæ Opii Camphoratæ, fʒj.; Vini Ipecacuanhæ, fʒiij.; Sirupi Simplicis, fʒiij., M. Fiat sirupus expectorans, cujus sumat cochleare amplum quâque secundâ horâ. (In chronic bronchitis.)

℞ Vini Ipecacuanhæ, fʒiij.; Sirupi Tolutani, fʒv.; Mucilaginis Acaciæ, fʒi., M. Fiat mistura, capiat cochleare parvum omni horâ vel quâque secundâ horâ.—Cheyne. (For children threatened with an attack of croup or bronchitis.)

℞ Antimonii et Potassæ Tartratis, gr. ij.; Aquæ destillatæ, fʒvij.; Aquæ Laurocerasi, fʒij.; Sirupi Simplicis, fʒvj., M. Fiat mistura, de quâ sumatur cochleare amplum bihorio. (In acute attacks of catarrh and bronchitis, combined with general antiphlogistic treatment.)

℞ Pulveris Senegæ, gr. xxx.; Carbonatis Sodæ siccati, gr. vj.; Pulveris scillæ, gr. j.; Sacchari Puri, gr. xij., M. Divide in pulveres sex, Capiat unum quartâ quâque horâ. (In the advanced stages of hoopingcough and bronchitis in children.)

℞ Tincturæ Lobeliæ Æthereæ (page 215), fʒij.; Misturæ Amygdalarum, fʒij.; Succi Conii (page 264), fʒij.; Sirupi Hemidesmi, fʒiiisss., M. Fiat mistura, cujus capiat cochleare amplum tertiis horis. (An excellent mixture in asthma and in paroxysmal coughs.)

℞ Pilulæ Ipecacuanhæ compositæ, ʒj.; Styracis Colati, ʒss.; Pulveris Lobeliæ, gr. xij., M. Divide in pilulas viginti quatuor, e quibus sumantur duæ sextis horis. (In old cases of bronchitis and in humoral asthma.)

NARCOTICS.

℞ Succi Belladonnæ (page 222), fʒiv.; Misturæ Camphoræ, fʒvj.; Sirupi Rhœados, fʒiss., M. Fiat mistura, cujus capiat cochleare amplum sextis horis. An excellent anodyne in neuralgia and tic doloureux.)

℞ Tincturæ Belladonnæ (page 222), fʒij.; Linimenti Saponis cum Opio, fʒviij., M. Fiat linimentum anodynum, sæpe utendum. (In neuralgic pains and in painful glandular enlargements.)

℞ Unguenti Belladonnæ, ʒij.; Camphoræ, rasæ et redactæ, ʒi.; Tincturæ Opii Camphoratæ, fʒi., M. Fiat unguentum. (An excellent application to painful hœmorrhoids, and along the urethra in chordee.)

℞ Tincturæ Cannabis, fʒi.; Mucilaginis Gummi Arabici, fʒij.; Aquæ Cinnamomi, fʒiss., M. Fiat haustus, statim sumendus et repetatur secundis horis vel sæpiùs si minetur morbus. (In tetanus, or hydrophobia; half the above quantity may be taken every five or six hours in sciatica and other neuralgic pains.)

℞ Succi Hyoscyami (page 226), fʒss.; Misturæ Camphoræ, fʒij.; Sirupi Rhœados, fʒij., M. Fiat haustus horâ somni sumendus, et repetatur alternâ horâ si non dormiat. (An excellent narcotic draught in cases where, from any cause, opium is inadmissible.)

℞ Tincturæ Lactucarii, f℥i. ; Aquæ destillatæ, f℥i. ; Aquæ Lauro-cerasi, min. xx. ; Sirupi Simplicis, f℥ij., M. Fiat haustus manè et serò sumendus. (An excellent anodyne draught in phthisis.)

℞ Lupulinæ, gr. viij. ; Mucilaginis, q. s. Fiant pilulæ duæ, horâ decubitûs sumendæ. (A doubtful narcotic, used sometimes in the restlessness and watchfulness of mania and other nervous affections.)

℞ Morphiæ Muriatis, gr. ¼ ; Extracti Glycirrhizæ, gr. ij., M. Fiat pilula, horâ somni sumat. (For relieving pain and procuring rest.)

℞ Muriatis Morphiæ Solutionis (Ed. Phar.), min. xxx. ; Aquæ Florum Aurantii, f℥i. ; Sirupi Aurantii, f℥ss., M. Fiat haustus pacificus, horâ somni sumendus. (An excellent anodyne draught.)

℞ Morphiæ Sulphatis, gr. ss. ; Acidi Sulphurici diluti, min. ij. ; Aquæ destillatæ, f℥ij. ; Sirupi Limonum, f℥ss., M. Fiat solutio, duabus vicibus sumenda. (An excellent anodyne where night-watchings are troublesome.)

℞ Pilulæ Saponis cum Opio, gr. xx. ; Campnoræ, rasæ et redactæ, ℥ss. ; Mucilaginis, q. s., M. Divide in pilulas xij., capiat unam quâque sextâ horâ. (In priapism and irritation of the neck of the bladder.)

℞ Tincturæ Stramonii (page 245), min. xv. ; Aquæ destillatæ, f℥i. ; Sirupi Limonum, f℥ss., M. Fiat haustus tertiis horis repetendus donec dolor mitescat. (Exceedingly useful in tic douloureux, sciatica, and all forms of chronic disease attended with acute pain.)

℞ Extracti Stramonii, gr. ij. ; Extracti Hyoscyami, gr. vj. ; Extracti Humuli, ℥ss., M. Divide in pilulas duodecim, quarum capiat unam quartâ quâque horâ dolorem lenire. (In painful nervous affections, and in all forms of chronic disease attended with acute pain.)

REFRIGERANTS.

℞ Acetosellæ, ℥j. ; Aquæ ferventis, f℥viij. ; Infunde per horam in vase clauso, exprime et cola, dein adde Sirupi Mori, f℥ij. Fiat mistura, de quâ sumatur cochlearia ampla duo subinde. (An agreeable refrigerant in febrile and inflammatory disorders.)

℞ Succi spissati Sambuci, ℥ss. ; Aquæ destillatæ, f℥viij. ; Tere simul ut fiat solutio, dein adde, Nitratis Potassæ, ℥ss., et solve. Capiat cochleare amplum bihorio. (A useful refrigerant in hœmoptysis with active inflammation.)

℞ Sirupi Aceti, f℥ij. ; Aquæ destillatæ, f℥viij., M. Fiat mistura, capiat cochleare amplum subinde. (To allay thirst in febrile affections.)

℞ Nitratis Potassæ, gr. xv. ; Aquæ destillatæ, f℥iss. ; Sirupi Limonum, f℥ij., M. Fiat haustus, ter in die sumendus. (In active hœmorrhages.)

℞ Sodæ Bicarbonatis, ℈i. ; Aquæ, f℥iss. ; Sirupi Simplicis, f℥ij., M. Fiat haustus in effervescentiâ cum succi Limonum recentis cochleari magno, subinde sumendus. (To allay thirst in febrile and inflammatory disorders.)

SEDATIVES OR CONTRA-STIMULANTS.

℞ Acidi Hydrocyanici, min. j. ; Aquæ destillatæ, f℥vij. ; Sirupi Simplicis, f℥i., M. Fiat haustus quâque secundâ horâ sumendus donec evanescant symptomata. (In gastric irritability, in nervous palpitations, in angina pectoris, &c.)

℞ Tincturæ Aconiti (page 259), min. v. ; Misturæ Camphoræ, ℥i., M. Fiat haustus, quartis horis sumendus donec dolor mitescat. (Most useful in acute rheumatism and in neuralgia ; its effects should be carefully watched.)

℞ Tincturæ Aconiti (page 259); Succi Conii (page ϱϱϱ), ana, f℥ss., M. Sit pro lotione. (Exceedingly useful applied over the seat of the pain in tic doloureux.)

℞ Extracti Alcoholici Aconiti (p. 259), gr. ij.; Myristicæ Adipis, gr. xviij.; Mucilaginis. q. s., ut fiat massula. Divide in pilulas sex quarum sumatur una sextis horis. (In chronic rheumatism and other painful affections.)

℞ Succi Conii (page 264), f℥vj.; Sirupi Aurantii, f℥x.; Aquæ Cinnamomi, f℥vj., M. Fiat mistura, cujus capiat cochleare amplum ter de die. (In chronic rheumatism, in neuralgia, and in painful spasmodic diseases.)

℞ Creasoti, min. ij., Mucilaginis Gummi Arabici, f℥j.; Aquæ destillatæ, f℥i.; Spiritus Myristicæ, f℥ss., M. Fiat haustus quâque secundâ horâ sumendus, donec sedantur vomitiones. (In obstinate vomitings.)

℞ Succi Digitalis (page 266), min. xij.; Misturæ Camphoræ, f℥j.; Sirupi Aurantii, f℥ij.; Acidi Hydrocyanici, min. j., M. Fiat haustus, bis terve in die sumendus. (An excellent remedy in nervous palpitations.)

℞ Cyanidi Potassi, gr. j.; Aquæ destillatæ, f℥iiiss.; Sirupi Limonum, f℥ss., M. Divide in haustus octo, sumatur unus pro dosi.—Donovan. (Used as a substitute for hydrocyanic acid.)

GENERAL STIMULANTS.

℞ Ætheris Sulphurici, f℥j.; Cetacei, gr. ij.; Tere simul et gradatim adde Aquæ Menthæ Piperitæ, f℥j. Fiat haustus. (In nervous headache spasmodic colic, fainting, &c.)

℞ Spiritus Ætheris Sulphurici, f℥j.; Misturæ Camphoræ, f℥i.; Tincturæ Cardamomi compositæ, f℥ij., M. Fiat haustus statim sumendus, et repetatur bihorio molestante flatulentia. (In flatulent colic.)

℞ Spiritus Ætheris Sulphurici compositi, f℥ss.; Tincturæ Opii, min. x.; Misturæ Camphoræ, f℥j.; Spiritus Anisi compositi, f℥i., M. Fiat haustus sextis horis sumendus. (A useful stimulant in the low stages of fever.)

℞ Carbonatis Ammoniæ, gr. v.; Misturæ Camphoræ, f℥i.; Infusi Arnicæ (page 287); Spiritus Armoraciæ compositi, ana, f℥ii., M. Fiat haustus, quâque secundâ horâ sumendus. (In adynamic febrile affections.)

℞ Olei Cajuputi, min. v.; Mucilaginis Tragacanthæ, f℥i.; Tere simul et adde, Infusi Caryophyllorum, f℥iss.; Tincturæ Ammoniaæ compositi, min. vj., M. Fiat haustus. (In hysterical and nervous affections.)

℞ Spiritus Ætheris Sulphurici, f℥i.; Solutionis Muriatis Morphiæ, min. xv.; Aquæ Menthæ Piperitæ, f℥i., M. Fiat haustus statim sumendus, et repetatur, si opus sit, quartâ parte horæ. (A powerful stimulating antispasmodic; very useful in spasm of the stomach and in spasmodic colic.)

℞ Calcis Chlorinatæ, ℥ij.; Aquæ destillatæ, Oj.; Solve et cola, dein adde, Mellis despumati, ℥j. Fiat gargarisma, sæpè utenda, priùs phialâ concussâ. An exceedingly useful gargle in excessive mercurial salivation.)

℞ Calcis Chlorinatæ, ʒi.; Aquæ destillatæ, f℥x.; Solve et cola, dein adde, Acidi Prussici, f℥i. Fiat lotia; Signetur, Poison. (An excellent application in chronic cutaneous diseases, when itching and tingling are very troublesome.)

℞ Camphoræ, rasæ et redactæ, ℥ij.; Mucilaginis Gummi Arabici, f℥i.; Aquæ destillatæ, f℥vij., M. Fiat mistura, de quâ sumatur cochleare amplum quartis horis. (In cases of chronic bronchitis in the old and debilitated.)

℞ Camphoræ rasæ et redactæ, ℥ij.; Lactis recentis, f℥vj.; Aquæ Menthæ Pulegii, f℥ij., M. Fiat mistura cujus capiat cochleare amplum quartâ quâque horâ. (In the same cases as the above.)

℞ Camphoræ rasæ et redactæ, gr. xij. ; Carbonatis Ammoniæ, gr. ix. ; Extracti Hyoscyami, gr. vj. ; Mucilaginis, q. s. Fiat massula et divide in pilulas sex, quarum sumatur una bihorio. (In the advanced stages of typhoid and nervous fevers.)

℞ Cerevisiæ Fermenti ; Misturæ Camphoræ, ana, f℥vi. ; Tincturæ Arnicæ (page 287), f℥ij., M. Fiat mistura, de quâ sumatur cochlearia tria ampla tertiis horis. (An excellent stimulant in the advanced stages of fevers when nervous symptoms predominate.)

℞ Muriatis Ammoniæ, ℈j. ; Pulveris Aromatici, gr. vj. ; Theriacæ, q. s. ut fiat bolus. Capiat talem sextâ quâque horâ. (For uses, see page 284.)

℞ Potassi Sulphureti, gr. xl. ; Aquæ destillatæ, f℥vj. ; Sirupi Hemidesmi, f℥ij., M. Fiat mistura, cujus capiat cochleare amplum ter quaterve in die. In rebellious cutaneous diseases.)

℞ Tincturæ Sabadillæ (page 315), f℥i. ; Tincturæ Camphoræ, f℥ii. ; Spiritus Rosmarini, f℥ss., M. Fiat embrocatio cum panno laneo partibus dolentis applicanda. (In neuralgia and in muscular pains.)

℞ Liquoris Sodæ Chlorinatæ, f℥iiss. ; Infusi Serpentariæ, f℥vj. ; Sirupi Aurantii, f℥iss., M. Fiat mistura ; Capiat cochlearia ampla duo quartis horis. (In the advanced stages of typhoid fever.)

℞ Olei Terebinthinæ, f℥iiss. ; Mucilaginis Tragacanthæ, f℥ss. ; Infusi Armoraciæ compositi, f℥iij., M. Capiat cochleare amplum unum quâque secundâ horâ. (A useful stimulant in adynamic fevers.)

℞ Olei Terebinthinæ, f℥ss. ; Adipis Præparati, ℥iss. ; Olei Bergamotæ, min. xii., M. Fiat unguentum, mane nocteque applicandum. (In chronic eczema and impetigo of the scalp.)

SPECIAL STIMULANTS.

℞ Arsenici Iodidi, gr. ij. ; Mannæ duræ, gr. xl. ; Mucilaginis, q. s., M. Fiat massula et divide in pilulas xx., quarum capiat unam ter de die. (In psoriasis and lepra ; the dose should be gradually increased, until one fourth of a grain is taken three times a day.)

℞ Auri Iodidi, gr. j. ; Pulveris Gummi Arabici, gr. xxx. Misce intimè et divide in partes æquales quindecim, è quibus sumatur una ter in die. (In secondary syphilitic affections ; the dose should be gradually increased to one tenth of a grain.)

R Auri Chloridi, gr. j. ; Extracti Alcoholici Aconiti (page 259), gr. x. ; Pulveris Glycirrhizæ, ℈ij. ; Sirupi, q. s. Misce intimè et divide massulam in pilulas viginti, quarum sumatur una ter in die. (In secondary syphilitic affections attended with much pain.)

℞ Sodii Auro-terchloridi, gr. ij. ; Mannæ duræ, gr. l. Tere benè simul, et ope mucilaginis forma in pilulas viginti quatuor, è quibus sumatur una ter in die. (In syphilitic affections, both primary and secondary.)

℞ Sodii Auro-terchloridi, gr. iv. ; Solve in aquæ destillatæ, q. s. ; Extracti Aconiti, ℈ss. ; Eztracti Dulcamaræ, ʒi. ; Athææ Radicis, in pulvere, q. s., M. Divide in pilulas lxxx., quarum capiat unam ter in die.—Grötzner. (Said to be very efficacious in venereal skin diseases.)

℞ Sodii Auro-terchloridi, gr. ij. ; Aquæ destillatæ, f℥i. ; Sirupi Simplicis, f℥ij., M. Fiat solutio, de quâ sumantur guttæ duodecim ter in die. (One of the best forms for administering the preparations of gold, as the dose can be apportioned with great accuracy.)

℞ Copaibæ, f℥iij. ; Solutionis Alkalinæ (Brandish), f℥iss. ; Tere bene simul n mortario vitreo, dein adde inter terendum, Sirupi Limonum, f℥ss. Fiat mistura, capiat cochleare minimum ter in die ex cyatho aquæ. (This is an excellent form for administering copaiva.)

Hydrargyri Iodidi rubri, gr. j.; Extracti Gentianæ; Extracti Chamæmeli, ana, ʒss., M. Divide in pilulas xij. Capiat unam mane nocteque. (Alterative and tonic.)

℞ Hydrargyri Iodidi rubri, gr. v.; Spiritus Vini Rectificati, fʒi.; Solve, dein adde, Aquæ destillatæ, fʒij.; Iodidi Potassii, ʒij.; Sirupi Aurantii, fʒss., M. Fiat solutio, cujus sumantur min. xx. ter in die. (In secondary syphilitic affections; every twenty minims contain a twelfth of a grain of iodide of mercury and two grains of iodide of potassium.)

℞ Indigo (aquæ guttis nonnullis subacta), ʒij. to ʒss.; Pulveris Aromatici, gr. xv. to gr. xxx.; Sirupi Simpicis, fʒss. to fʒi., M. Fiat electuarium sumendum in die in portionibus divisis. (For uses, see page 346.)

℞ Iodinii, gr. iv.; Ætheris Sulphurici, fʒi., Solve. Capiat guttas decem ter in die. (This is Magendie's ethereal tincture of iodine.)

℞ Potassii Bromidi, gr. xv.; Aquæ Florum Aurantii, fʒiij.; Sirupi Aurantii, fʒi., M. Fiat mistura, cujus capiat partem quartam sextâ quâque horâ. (In chronic enlargements of the liver and spleen.)

℞ Olei Morrhuæ, fʒiv.; Aquæ Potassæ Carbonatis, fʒss.; Sirupi Limonum, fʒij.; Aquæ Carui, fʒiss.; Spiritus Carui, fʒss., M. Fiat mistura, cujus sumantur cochlearia ampla duo ter in die. (In the cases in which cod-liver oil is indicated: see page 348.)

℞ Olei Morrhuæ, fʒss.; Liquoris Potassæ, fʒss.; Adipis præparati, q. s., M. Fiat unguentum, sæpè utendum. (In scrofulous ulcerations, and in obstinate cutaneous diseases.)

℞ Strychniæ, gr. j.; Acidi Sulphurici diluti, min. ij.; Spiritus Vini Rectificati, fʒj.; Aquæ destillatæ, fʒxj., M. Fiat solutio, cujus capiat cochleare minimum ter in die. (Each fluid-drachm contains a twelfth of a grain of strychnia in the state of sulphate.)

℞ Strychniæ, gr. j.; Acidi Acetici, min. iv.; Spiritus Vini Rectificati, fʒj., M. Fiat solutio, cujus sumantur min. v. ter in die. (Every five minums contain a twelfth of a grain of strychnia in the state of acetate.)

℞ Strychniæ, ʒss.; Olei Olivæ, fʒiss., M. (Ten drops to be rubbed over the temples three or four times a day in cases of amaurosis depending on paralysis of the optic nerve.)

℞ Potassii Bromidi, ʒss.; Adipis Præparati, ʒi; Brominei, min. vj., M. Fiat unguentum. (About the size of a nut of this ointment should be rubbed over chronic glandular enlargements twice daily.)

TONICS.

℞ Argenti Nitratis, gr. ij.; Fellis Bovini inspissati; Extracti Chamæmeli, ana, ʒss., M. Divide in pilulas duodecim, quarum sumatur una mane meridieque. (In chronic affections of the stomach accompanied with much pain, but without organic disease.)

℞ Argenti Oxydi, gr. vj.; Extracti Artemisiæ Absinthii, ʒj., M. Divide in pilulas xij., e quibus sumatur una ter in die. (In angina pectoris, epilepsy, chorea, &c.)

℞ Iodinei Liquoris compositi (E.), fʒss.; Liquoris Arsenicalis, fʒiss., M. Fiat mistura, cujus capiat min. v. ter in die e cyatho vinario misturæ sequentis.

℞ Infusi Absinthii (page 359); Sirupi Aurantii, ana, fʒiv., M. (This combination of iodine and arsenite of potash will be found very effectual in the treatment of chronic cutaneous affections of a scaly character.)

℞ Bismuthi Subnitratis, gr. l.; Pilulæ Colocynthidis compositi, ʒi.; Sirupi Zingiberis, q. s., M. Fiant pilulæ xxiv., quarum capiat duas mane meridieque. (In pyrosis with constipation.)

℞ Cetrarin (page 372), gr. xxiv. ; Extracti Calumbæ (page 370), ʒss., M. Divide in pilulas xij., quarum sumatur una quartâ quâque horâ per dies duos febre aggrediente. (An excellent febrifuge.)

℞ Tincturæ Chirettæ (page 373,) fʒss. ; Liquoris Cinchonæ (page 381), fʒij. ; Infusi Cascarillæ, fʒviss. ; Sirupi Aurantii, fʒvj., M. Fiat mistura, cujus capiat cochlearia ampla duo ter in die. (An excellent tonic mixture in convalescence from acute diseases.)

℞ Quinæ Muriatis, gr. xij. ; Acidi Muriatici diluti, min. v. ; Aquæ destillatæ, fʒvj. ; Sirupi Florum Aurantii, fʒij., M. Fiat mistura, Capiat cochlearia ampla duo ter in die. (A useful tonic mixture in chronic debility.)

℞ Ferri Ammonio-tartratis, ℈ij. ; Aquæ destillatæ, fʒvj. ; Sirupi Hemidesmi, fʒij., M. Fiat mistura, cujus capiat cochlearia ampla duo ter in die. (A mild chalybeate tonic.)

℞ Ferri Carbonatis Saccharati, ʒss. ; Pulveris Myrrhæ, gr. xxiv. ; Pulveris Aromatici, ʒss., M. Divide in partes æquales duodecim, quarum sumatur una ter in die. (An excellent combination in the protracted diarrhœas of infancy and childhood.)

℞ Ferri Iodidi,, ʒss. ; Croci, in pulvere, ʒij. ; Sacchari puri, ʒiv., M. Fiant Trochisci, No. 120 ; sumantur sex usque ad decem quotidie.—Pierquin. (An agreeable mode of administering the iodide of iron in amenorrhœa and chlorosis.)

℞ Salicin (page 406), gr. xvj. ; Infusi Gentianæ compositi, fʒvj. ; Sirupi Hemidesmi, fʒij., M. Capiat cochlearia ampla duo ter in die. (An excellent tonic in convalescence from acute diseases of the digestive organs.)

℞ Salicin, ℈ij. ; Pulveris Aromatici, ʒi., M. Divide in partes æquales duodecim, quarum capiat unam quartâ quâque horâ per dies duos, febre aggrediente. (An excellent substitute for disulphate of quina.)

B. POSOLOGICAL TABLE.

The doses in this table are those adapted for an adult, but the ordinary proportion, according to the age of the patient, may be regulated by the following rules: The dose for an adult being 1, suppose ʒi. ; under one year it will be from 1-16th to 1-12th, that is, from gr. iv. to gr. v. ; at two years old, 1-8th or gr. viij. ; at three years old, 1-6th or gr. x. ; at four years old, ¼ or gr. xv. ; at seven years old, ½ or ℈i. ; at fourteen years old, ½ or ʒss. ; at twenty years old, ⅔ or ℈ij. ; and from twenty to sixty, a full dose.

[The ratio of doses for children in this table requires essential modification to adapt it to numerous articles employed in medicine ; for if the doses be reduced by this scale, many of them will be inert. For example, the maximum dose of calomel as a cathartic is here set down at 6 grs. for an adult ; a child under one year would take less than ½ a grain. The ordinary dose of tart. antimon., 2 grs., as an emetic, reduced 1-16th, would be but the 1-8th of a grain, which would be useless as an emetic ; and so of a multitude of other articles. Indeed, of any of the active cathartics, a child seven years old will require half the dose of an adult, and under one year, one fourth, or one eighth at the least, of that required at maturity. In the use of narcotics and other active poisons, the cautious reduction of the dose for children here required is discreet, but no practical man in the United States is rigidly governed by the scale of the author.]

Absinthium	ʒss. to ʒi.
Acetum	fʒij. to fʒss.
——— Colchici	fʒss. to fʒij.
——— Opii	min. viij. to min. xxv.
——— Scillæ	fʒss. to fʒiss.
Acidum Benzoicum	gr. v. to gr. xxx.
——— Citricum	℈i. to ʒi.
——— Hydrocyanicum	min. i. to min. ij.

Acidum Muriaticum dilutum, D.	gtt. x. to gtt. xxx.
——— Muriaticum dilutum, L. E.	ʒss. to ʒi.
——— Nitricum dilutum, D.	gtt. x. to gtt. xxx
——— Nitricum dilutum, L. E.	ʒss. to ʒi.
——— Nitro-muriaticum	gtt. x. to gtt. xx.
——— Phosphoricum dilutum	min. xx. to ʒi.
——— Sulphuricum dilutum	min. x. to min. xxx
——— Sulphuricum aromaticum	min. x. to min xx.
——— Tartaricum	gr. x. to ʒss.
Aconiti pulvis	gr. iij. to gr. xij.
Æther Nitrosus	min. x. to min. xxx.
——— Sulphuricus	ʒss. to ʒij.
Allium sativum	ʒss. to ʒj.
Aloe Socotrina vel Indica	gr. iij. to gr. xv.
Aloë Hepatica vel Barbadensis	gr. ij. to gr. v.
Alumen	gr. x. to ʒss.
Ammoniacum	gr. x. to ʒss.
Ammoniæ aqua	min. x. to min. xxx.
——— bicarbonas	gr. v. to gr. xxv.
——— carbonas (Antacid)	gr. v. to gr. xx.
——— (Emetic)	gr. xxx. to gr. xl.
——— (Stimulant)	gr. v. to gr. xv.
——— hydrosulphas	min. iv. to min vj.
——— murias	gr. v. to gr. xxx.
Anethi fructus	gr. x. to ʒi.
Angelicæ fructus	ʒss. to ʒi.
——— radix	gr. x. to ʒss.
Ainsi fructus	gr. x. to ʒss.
Anthemis nobilis	ʒss. to ʒij.
Antimonii oxydum nitromuriaticum	gr. iij. to gr. x.
Antimonii sulphuretum	gr. x. to ʒij.
——— aureum	gr. j. to gr. iv.
Antimonium tartarizatum (Diaphoretic)	gr. 1-12th to gr. 1-16th.
——— (Emetic)	gr. ij. to gr. v.
——— (Expectorant)	gr. 1-16th to gr. 1-10th.
——— (Sedative)	gr. j. to gr. iij.
Aqua Ammoniæ acetatis	fʒss. to fʒj.
——— carbonatis	min. xxx. to min. xl.
——— Anethi	fʒss. to fʒiij.
——— Barytæ muriatis	min. v. to min. x.
——— Calcis	fʒi. to fʒiv.
——— Composita	fʒij. to fʒiv
——— Muriatis	min. xxx. to fʒij.
——— Carui	fʒi. to fʒiv.
——— Cassiæ	fʒi. to fʒiv.
——— Chalybeata	fʒij. to fʒiij
——— Chlorinii	fʒss. to fʒij.
——— Cinnamomi	fʒi. to fʒiv.
——— Fœniculi	fʒi. to fʒiv.
——— Lauro-cerasi	fʒss. to fʒi.
——— Laxativa Viennensis	fʒij. to fʒiv
——— Magnesiæ bicarbonatis	fʒss. to fʒiss.
——— Menthæ piperitæ	fʒi. to fʒij.
——— pulegii	fʒi. to fʒij.
——— viridis	fʒi. to fʒij.
——— Pimentæ	fʒi. to fʒij.
——— Potassæ	min. x. to min. xl.
——— carbonatis	min. x. to fʒi.
——— effervescens	fʒij. to fʒiv.
——— sulphureti	min. x. to fʒi.
——— Sodæ carbonatis	fʒss. to fʒi.
——— effervescens	fʒvj. to fʒviij
Argenti nitras	gr. 1-6th to gr. iij.
——— oxydum	gr. ss. to gr. j.
Arsenicum album	gr. 1-16th to gr. ⅛th.
Arsenici iodidum	gr. 1-10th to gr. ¼th.

Artemisia santonica	gr. xx. to gr. xxx.
Assafœtida	gr. x. to ʒss.
Auri iodidum	gr. 1-15th to gr. 1-10th.
—— perchloridum	gr. 1-20th to gr. 1-15th.
—— peroxydum	gr. 1-10th to gr. ¼th
—— pulvis	gr. ¼th to gr. iij.
Balsamum Peruvianum	min. xx. to min. xl.
———— Tolutanum	gr. x. to gr. xxx
Belladonnæ folia	gr. ss. to gr. j.
Belladonnæ radix	gr. ¼th to gr. ss.
Bismuthum album	gr. v. to gr. xx.
Calamus aromaticus	gr. xx. to ʒj.
Calomelas (Alterative)	gr. j. to gr. iij.
———— (Antiphlogistic)	gr. iij. to gr. v.
———— (Cathartic)	gr. ij. to gr. vj.
Calumba	gr. x. to ʒss.
Calx chlorinata	gr. ij. to gr. v.
Cambogia	gr. ij. to gr. v
Camphora	gr. v. to gr. x.
Canella	gr. x. to ʒss.
Cantharis	gr. ss. to gr. ij.
Capsicum	gr. ij. to gr. viij
Cardamine pratensis	ʒij. to ʒiij.
Cardamomi fructus	gr. v. to gr. xx.
Carui fructus	ʒi. to ʒij.
Caryophylli	gr. x. to ʒss.
Cascarilla	gr. x. to ℈ij
Cassiæ cortex	gr. x. to ʒss
Cassiæ pulpa	ʒss. to ʒiij.
Castoreum	ʒi. to ʒij.
Catechu	gr. x. to ʒi.
Cerevisiæ fermentum	fʒij. to fʒiij.
Cetrarin	gr. ij. to gr. v.
Chiretta	gr. x. to gr. xx.
Cinchonæ cortex (Antiperiodic)	ʒi. to ʒij.
———— (Tonic)	gr. x. to ℈ij.
Cinchonia	gr. iij. to gr. v.
Cinnamomum	gr. x. to ʒss.
Colchici cormus	gr. ij. to gr. viij.
——— semina	gr. ij. to gr. v.
Colocynthis	gr. ij. to gr. viij.
Confectio aromatica	gr. xx. to ʒi.
———— aurantii	ʒij. to ʒi.
———— opii	gr. x. to ʒi.
———— piperis nigri	ʒi. to ʒij.
Conii folia	gr. v. to gr. x.
—— fructus	gr. iij. to gr. vj.
Conserva aurantii	ʒij. to ʒj.
———— rosæ	ʒj. to ʒij.
———— rutæ	℈j. to ʒi.
Contrajerva	℈j. to ℈ı.
Copaiba	min. x. to fʒj.
Coriandri fructus	ʒss. to ʒj.
Corrosivus sublimatus	gr. 1-12th to gr. ¼th.
Creasotum	min. j. to min. ij
Creta præparata	gr. x. to ʒij.
Crocus sativus	gr. xij. to ʒj.
Cubebæ pulvis	℈j. to ʒiij.
Cumini fructus	gr. x. to ʒss.
Cupri sulphas (Astringent and Tonic)	gr. ss. to gr. iij.
———— (Emetic)	gr. xij. to gr. xv.
Cuprum ammoniatum	gr. ss. to gr. v.
Cuspariæ cortex	gr. x. to ʒss.
Dauci fructus	gr. xx. to ℈ij.

Decoctum Aloës compositum	ʒss. to ʒij.
——— Althææ	ʒj. to ʒij.
——— Bistortæ	ʒi. to ʒij.
——— Cetrariæ	ʒj. to ʒiv.
——— Cinchonæ	ʒj. to ʒij.
——— Colocynthidis	ʒij. to ʒss.
——— Dulcamaræ	ʒj. to ʒij.
——— Ergotæ	ʒss. to ʒj.
——— Gei	ʒss. to ʒj.
——— Geoffroyæ	ʒss. to ʒj.
——— Glycirrhizæ	ʒj. to ʒij.
——— Granati	ʒss. to ʒj.
——— Guaiaci compositum	ʒij. to ʒiv.
——— Hæmatoxyli	ʒi. to ʒij.
——— Malvæ	ʒiv. to ʒvj.
——— Mezerei	ʒiv. to ʒv.
——— Pyrolæ	ʒi. to ʒij.
——— Quercus	ʒj. to ʒiv.
——— Sarsaparillæ	ʒiv. to ʒviij.
——— compositum	ʒiv. to ʒvj.
——— Senegæ	ʒij. to ʒiij.
——— Scoparii	ʒi. to ʒiv.
——— Taraxaci	ʒi. to ʒij.
——— Tormentillæ	ʒi. to ʒiss.
——— Tussilaginis	ʒij. to ʒiij.
——— Ulmi	ʒiv. to ʒiv.
——— Uvæ-ursi	ʒj. to ʒiij.
Delphinia	gr. 1-12th to gr. ¼th.
Digitalis (Diuretic)	gr. ss. to gr. j.
——— (Sedative)	gr. j. to gr. iij.
Drymis aromatica	℈i. to ʒj.
Elaterina	gr. 1-20th to gr. 1-10th
Elaterium	gr. 1-16th to gr. ¼th.
Electuarium aromaticum	gr. x. to gr. xl.
——— Catechu compositum	℈i. to ʒij.
——— Cassiæ	ʒij. to ʒj.
——— Opii	gr. x. to ʒj.
——— Sennæ	ʒii. to ʒss.
Ergota	℈i. to ʒi.
Essence of Ginger	min. xx. to min. xl.
——— Pennyroyal	gtt. xx. to gtt. xxx.
——— Peppermint	gtt. xx. to gtt. xxx.
——— Spearmint	gtt. xx. to gtt. xxx.
Extractum Aconiti	gr. ij. to gr. viij.
——— alcoholicum	gr. ¼th to gr. j.
——— Aloës	gr. v. to gr. xv.
——— Anthemidis	gr. x. to ʒss.
——— Artemisiæ absinthii	gr. x. to gr. xx.
——— Belladonnæ	gr. ss. to gr. iv.
——— Calumbæ	gr. v. to gr. xx.
——— Cannabis	gr. x. to gr. xij
——— Cinchonæ	gr. v. to gr. xx
——— Chamæmeli	gr. x. to ʒss.
——— Colchici	gr. j. to gr. iij.
——— aceticum	gr. j. to gr. iij.
——— Colocynthidis	gr. v. to ℈j.
——— compositum	gr. v. to gr. xv.
——— Conii	gr. iij. to gr. v.
——— Digitalis	gr. ⅛th to gr. ¼th
——— Gentiana	gr. x. to ʒss.
——— Hæmatoxyli	gr. x. to gr. xxx.
——— Humuli lupuli	gr. v. to gr. xx.
——— Hyoscyami	gr. v. to gr. xv.
——— Jalapæ, D. L.	gr. x. to ℈j.
——— Jalapæ, E.	gr. iij. to gr. x.

Extractum Krameriæ	gr. xx. to gr. xl.
——— Lactucæ	℈i. to ʒj.
——— Menyanthes	gr. x. to ʒss.
——— Nucis-vomicæ	gr. ss. to gr. iij.
——— Opii	gr. ss. to gr. iv.
——— Papaveris	gr. ij. to gr. xx.
——— Pareiræ	gr. x. to ʒss.
——— Quassiæ	gr. v. to gr. xv.
——— Quercus	gr. x. to ʒj.
——— Rhei	gr. x. to ʒss.
——— Rutæ	gr. x. to gr. xx.
——— Sabadillæ	gr. ½th to gr. ¼th.
——— Sarsaparillæ	ʒss. to ʒij.
——— fluidum	fʒss. to fʒi.
——— Scammonii	gr. ij. to gr. v.
——— Stramonii	gr. ⅓th to gr. ss.
——— Taraxaci	gr. x. to ʒss.
——— Uvæ-ursi	gr. v. to gr. xv.
Fel Bovinum inspissatum	gr. v. to gr. x.
Ferri Acetas	min. v. to min. xx.
—— Ammonio-chloridum	gr. v. to gr. xv.
—— Ammonio-citras	gr. v. to gr. viij.
—— Ammonio-tartras	gr. v. to gr. viij.
—— Bromidum	gr. iij. to gr. viij.
—— Carbonas saccharatum	gr. v. to gr. xxx.
—— Citras	gr. v. to gr. viij.
—— Cyanuretum	gr. iij. to gr. vj.
—— et Quinæ Citras	gr. iij. to gr. vj.
—— Iodidum	gr. ij. to gr. v.
—— Lactas	gr. vj. to gr. xij.
—— Limatura	gr. x. to ʒss.
—— Oxydum Nigrum	gr. v. to gr. xx.
——— Rubrum	ʒss. to ʒiv.
—— Pernitras	min. xx. to min. xxx.
—— Sulphas	gr. j. to gr. v.
—— Exsiccatus	gr. ss. to gr. iij.
Ferrum Tartarizatum	gr. v. to gr. xx.
Fœniculi Fructus	ʒss. to ʒi.
Galbanum	gr. x. to gr. xx.
Gentiana	gr. x. to gr. xxx.
Geoffroyæ Cortex	gr. xv. to gr. xxx.
Geum Urbanum	ʒss. to ʒi.
Gigartina Helminthocorton	gr. x. to ʒij.
Granatum	ʒss. to ʒj.
Guaiaci Resina	gr. x. to ʒss.
Helleborus Niger	gr. iij. to gr. xij.
Hydrargyri Acetas	gr. j. to gr. iij.
——— Bicyanidum	gr. 1-12th to gr. ¼th.
——— Biniodidum	gr. 1-16th to gr. ⅛th.
——— Iodidum	gr. j. to gr. iij.
——— Oxydum rubrum	gr. ¼th to gr. ss.
——— Sulphuretum nigrum	gr. v. to ʒss.
Hydrargyrum cum Cretâ	gr. x. to ʒss.
——— Magnesiâ	gr. x. to ʒss.
Hyoscyami Folia	gr. v. to gr. x.
——— Semina	gr. iij. to gr. viij.
Indigo	gr. v. to gr. x.
Infusum Absinthii	fʒj. to fʒij.
——— Anthemidis	fʒj. to fʒij.
——— Armoraciæ compositum	fʒj. to fʒij.
——— Arnicæ	fʒij. to fʒss.
——— Aurantii compositum	fʒj. to fʒij.

Infusum Buchu	ʃʒi. to ʃʒij.
——— Calumbæ	ʃʒi. to ʃʒiij.
——— Caryophylli	ʃʒj. to ʃʒij.
——— Cascarillæ	ʃʒj. to ʃʒij.
——— Catechu compositum	ʃʒi. to ʃʒij.
——— Centaurei	ʃʒj. to ʃʒij.
——— Chamæmeli	ʃʒj. to ʃʒij.
——— Chirettæ	ʃʒj. to ʃʒij.
——— Cinchonæ	ʃʒj. to ʃʒiij.
——— Cnici Benedicti	ʃʒiss. to ʃʒiij.
——— Cuspariæ	ʃʒi. to ʃʒij.
——— Digitalis (Diuretic)	ʒij. to ʃʒss.
——— (Sedative)	ʃʒi. to ʃʒij.
——— Ergotæ	ʃʒss. to ʃʒj.
——— Gallæ	ʃʒss. to ʃʒij.
——— Gentianæ compositum	ʃʒj. to ʃʒij.
——— Granati radicis	ʃʒss. to ʃʒiss.
——— Krameriæ	ʃʒj. to ʃʒij.
——— Lauri nobilis	ʃʒss. to ʃʒij.
——— Lini	ʃʒij. to ʃʒiv.
——— Lupuli	ʃʒi. to ʃʒij.
——— Marrubii	ʃʒiij. to ʃʒiv.
——— Melissæ	ʃʒij. to ʃʒiv.
——— Menthæ simplex	ʃʒj. to ʃʒij.
——— compositum	ʃʒj. to ʃʒiij.
——— Menyanthis	ʃʒj. to ʃʒij.
——— Pareiræ	ʃʒj. to ʃʒiv.
——— Quassiæ	ʃʒi. to ʃʒij.
——— Rhei	ʃʒj. to ʃʒiv.
——— Rosæ acidum	ʃʒj. to ʃʒij.
——— Sabinæ	ʃʒss. to ʃʒj.
——— Sarsaparillæ compositum	ʃʒiv. to ʃʒvj
——— Sassafras	ʃʒj. to ʃʒij.
——— Scoparii	ʃʒj. to ʃʒij.
——— Senegæ	ʃʒij. to ʃʒiij.
——— Sennæ compositum	ʃʒij. to ʃʒiv.
——— cum Tamarindis	ʃʒij. to ʃʒiv.
——— Serpentariæ	ʃʒi. to ʃʒij.
——— Simarubæ	ʃʒj. to ʃʒij.
——— Spigeliæ	ʃʒij. to ʃʒiv.
——— Valerianæ	ʃʒj. to ʃʒij.
Inula Helenium	℈j. to ʒij.
Ipecacuanha (Emetic)	gr. xij. to gr. xx.
——— (Expectorant)	gr. ¼th to gr. ij.
Jalapa	gr. x. to gr. xxx.
Kino	gr. x. to ʒss.
Krameria	gr. x. to ʒss.
Lactucarium	gr. v. to gr. xx.
Linum Catharticum	ʒj. to ʒiss.
Liquor Ammoniæ	min. x. to min. xxx.
——— sesquicarbonatis	min. xxx. to min. lx.
——— Arsenicalis	min. v. to min. x.
——— Arsenici et Hydrargyri hydriodatis	min. x. to min. xxx.
——— Calcis	ʃʒj. to ʃʒiv.
——— Cinchonæ	min. xx. to ʃʒss.
——— Hydrargyri bichloridi	ʃʒss. to ʃʒij.
——— Iodinei compositus	min. v. to min. xv.
——— Potassæ	min. x. to min. xl.
——— carbonatis	min. x. to ʃʒj.
——— effervescens	ʃʒij. to ʃʒviij.
——— Potassii iodidi compositus	ʃʒj. to ʃʒss.
——— Sodæ chlorinatæ	min. xx. to min. xxx.
——— effervescens	ʃʒvj. to ʃʒviij.

Liquor Taraxaci	min. x. to min. xl.
—— Tartari Emetici	min. xx. to min. xxx.
Lupulina	gr. vj. to gr. xij.
Magnesia (Antacid)	gr. x. to gr. xv.
—— (Cathartic)	℈j. to ʒj.
Magnesiæ carbonas (Antacid)	gr. xv. to ʒss.
—— (Cathartic)	ʒi. to ʒij.
—— Sulphas	ʒij. to ℥i
Manna	℥i. to ℥ij.
Mannite	ʒss. to ʒj
Mel Rosæ	ʒij. to ʒiv.
Menyanthes	gr. x. to ʒss
Mistura Ammoniaci	fʒss. to fʒj
—— Amygdalarum	fʒi. to fʒij.
—— Assafœtidæ	fʒss. to fʒiss.
—— Camphoræ	fʒi. to fʒij.
—— cum Magnesiâ	fʒss. to fʒj.
—— Cascarillæ composita	fʒi. to fʒiss.
—— Cinnasoti	fʒi. to fʒij.
—— Cretæ	fʒj. to fʒij.
—— Ferri composita	fʒi. to fʒij.
—— aromatica	fʒj. to fʒij.
—— Gentianæ composita	fʒj. to fʒij.
—— Guaiaci	fʒss. to fʒij
—— Monesiæ	fʒss. to fʒij.
—— Moschi	fʒj. to fʒij.
—— Scammonii	fʒj. to fʒij.
—— Spiritus Vini Gallici	fʒss. to fʒiss.
Monesia	gr. v. to gr. xv.
Morphia	gr. ¼th to gr. ss.
Morphiæ Acetas	gr. ¼th to gr. ss.
—— Murias	gr. ¼th to gr. ss.
Moschus	gr. x. to gr. xx.
Mucuna Pruriens	ʒj. to ℥ss.
Myristica Moschata	gr. x. to gr. xxx.
Myrrha	gr. x. to gr. xxx.
Nephrodium Filix-mas	ʒj. to ʒiij.
Nux-vomica	gr. v. to gr. xx.
Oleum Amygdalæ Amaræ	min. ¼th to min. ½.
—— Anethi	min. j. to min. v.
—— Anisi	min. ij. to min. viij.
—— Anthemidis	min. i. to min. v.
—— Cajuputi	min. v. to min. x.
—— Carui	min. j. to min. x.
—— Caryophylli	min. ij. to min. viij.
—— Cassiæ	min. ij. to min. v.
—— Cinnamomi	min. j. to min. v.
—— Copaibæ	min xv. to min. xxx.
—— Crotonis	min. j. to min. ij.
—— Cubebæ	min. x. to min. xxx.
—— Euphorbiæ Lathyris	min. iv. to min. viij.
—— Filicis Maris	min. xx. to min. xxx.
—— Fœniculi	min. ij. to min. x.
—— Juniperi	min. v. to min. x
—— Lavandulæ	min. ij. to min. v
—— Limonum	min. ij. to min.
—— Menthæ Piperitæ	min. ij. to min. v.
—— Pulegii	min. ij. to min. v.
—— Viridis	min. ij. to min. v
—— Morrhuæ	fʒss. to fʒj.
—— Myristicæ	min. j. to min. v.
—— Olivæ	fʒj. to fʒij.
—— Origani	min. j. to min. iij.

Oleum Pimentæ	min. ij. to min. v.
——— Ricini	f℥ss. to f℥ij.
——— Rosmarini	min. ij. to min. v.
——— Sabinæ	min. v. to min vj.
——— Sassafras	min. ij. to min. x.
——— Terebinthinæ (Anthelmintic)	f℥ss. to f℥ij.
——— (Cathartic)	f℥ss. to f℥iss.
——— (Diuretic)	min. x. to min. xxx
——— (Stimulant)	min. x. to min. xx.
Olibanum	ʒss. to ʒj.
Opium	gr. ss. to gr. iv.
Opoponax	gr. xx. to gr. xl.
Oxymel	f℥j. to f℥i.
——— Colchici	f℥i. to f℥ij.
——— Scillæ (Emetic)	f℥j. to f℥ij.
——— (Expectorant)	min. x. to min. xxx.
Pareira Brava	ʒss. to ʒi.
Pilulæ Aloes compositæ	gr. v. to gr. xv.
——— cum Myrrhâ	gr. x. to gr. xx.
——— et Assafœtidæ	gr. x. to gr. xv.
——— et Ferri	No. 1 to 3.
——— ante Cibum	No. 1 to 2.
——— Asiaticæ	No. 1 to 2.
——— Assafœtidæ	gr. x. to ℈i.
——— Calomelanos compositæ	gr. v. to gr. x.
——— Calomelanos et Opii	No. 1 to 2.
——— Cambogiæ compositæ	gr. x. to gr. xx.
——— Colocynthidis compositæ	gr. v. to gr. xv.
——— et Hyoscyami	No. 1 to 3.
——— Conii compositæ	gr. v. to gr. x.
——— Digitalis et Scillæ	gr. iij. to gr. v.
——— e Styrace	gr. iij. to gr. x.
——— Ferri Carbonatis	No. 1 to 4.
——— compositæ	gr. x. to gr. xx.
——— Sulphatis	gr. v. to gr. xv.
——— Galbani compositæ	gr. x. to ℈i.
——— Gambogiæ et Scammonii	gr. x. to gr. xx.
——— Hydrargyri (Alterative)	gr. iij. to gr. v.
——— (Cathartic)	gr. xij. to gr. xx.
——— Iodidi	gr. v. to gr. xv.
——— Ipecacuanhæ compositæ	gr. v. to gr. xx.
——— et Opii	gr. iv. to gr. viij.
——— Opii *sive* Thebaicæ	No. 1 to 3.
——— Plumbi Opiatæ	gr. viij. to gr. xij.
——— Rhei	gr. v. to gr. xv.
——— compositæ	gr. v. to ℈i.
——— et Ferri	gr. x. to gr. xv.
——— Sagapeni compositæ	gr. v. to gr. xx.
——— Saponis cum Opio	gr. iij. to gr. x.
——— Scillæ compositæ	gr. v. to gr. xv.
Pimenta	ʒss. to ʒi.
Piper Longum	gr. v. to ℈i.
——— Nigrum	gr. v. to gr. xx.
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